

WATER

Issue 176. September 2012

**What the Maori Council Case
Could Do for New Zealand**

**Urban Metering – The Quest to
Measure How Much Water is
Being Used and Also Being Lost**

**Adapting Water Efficiency
Messages for an Irrational
Audience**

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Established in 1958, *Water New Zealand* is a non-profit organisation.



Clive Rundle

President's Column

By the time this Journal lands on your desk, many of us will be making final arrangements to attend our annual conference in Rotorua. Networking opportunities like this are an important feature of our association as they enable us to refresh acquaintances, exchange views and build new connections that help us be successful in this industry. It is a highlight in our annual calendar and I look forward to catching up with those of you who are able to attend.

This is my last column as President, which leads me to reflect on what has been achieved during the past five years of my involvement on the Board and the changes that have occurred in our industry over that time.

It is gratifying to see the progress that has been made in public policy on the water environment. Water is now recognised as one of New Zealand's most important assets, providing us with a key strategic advantage. Improved water management now sits high on the political radar.

- In early 2009 the new Government passed its simplifying and streamlining reforms to the RMA, establishing the Environmental Protection Authority, with call in powers for projects of national significance.
- The Sustainable Water Programme of Action was replaced by the New Start

“Water is now recognised as one of New Zealand's most important assets, providing us with a key strategic advantage”.

for Freshwater policy in June 2009. This established the collaborative stakeholder led Land and Water Forum aimed at improving management of the resource. It has widely been regarded as a success and *Water New Zealand* has had a central role. Its next report will make recommendations on a national water strategy, a key *Water New Zealand* plank.

- A National Infrastructure Unit was established. The 2011 National Infrastructure Plan highlighted that the water sector was in need of attention, and several streams of activity are underway to address this.
- Auckland governance reforms rationalised the delivery of urban water services in the region.
- The Health (Drinking Water) Amendment Act 2007 was finally implemented earlier this year.
- A Treaty settlement Act addressing the Waikato River and the Tainui claim, was put in place.
- In March this year the Government announced its Better Local Government Reform Package, aimed at improving the efficiency and effectiveness of this sector.

I am pleased that *Water New Zealand* has contributed fully to these discussions. Given our wide membership base, it is a challenge to synthesise and then articulate a consolidated view on behalf of members. Excellent attendance at our regional meetings and the forum at the 2011 conference have enabled us to road test these views and they have met with good support as the right way forward for the water environment and our industry.

This past year has again been successful for the Association financially. Revenue from events has held up, along with publication and advertising sales. Costs have

been contained. Occupancy costs for our Wellington based staff were reduced significantly with a move to new premises. Pleasingly, this has enabled us to recently appoint an additional staff member with a technical focus to leverage the value from sharing experiences between members, improving our technical output, and further supporting the activities of our SIGs and the Water Services Managers Group.

It has been a pleasure to work with my Board colleagues over the past five years. I have been fortunate to lead a board that comprises an excellent cross-section of our membership, including Councils, CCOs, Consultants and Contractors and which has impressive depth of industry experience. I want to take this opportunity to thank them for their contribution and support. At the time of writing, voting is about to open for the election of two new board members. We have four excellent candidates so I am confident that your board will remain strong going forward.

So what lies ahead? Well one thing seems certain, and that is that we will see changes in our industry over the next few years. My fervent hope is that these changes will enable us to collectively deliver efficient and effective water services and environmental management, while preserving the 'public service' ethos that is so strong in our industry. For this reason *Water New Zealand* must continue to make your voice heard.

Lastly, I thank members for giving me the opportunity to serve them over the past two years as President of the Association. It has been a privilege. I know you will give my successor, Steve Couper, the same support I have received. ■

Clive Rundle
President, *Water New Zealand*

new members

Water New Zealand welcomes the following new members:

CHRIS HENDERSON
MARTYN COLE
MATT EWEN
BRENDON HARKNESS
RICK STEPHENS
PETER EVANS
RHIANNAN ROLLITT
MELANIE CROWE

JESSICA ZAME
SEATON ROLLESTON
STEWART STILL
CHRIS SOLLEDER
ANDREW CARVELL
STEFANIE TOEMMERS
STEFAN WHITING
HERBERT DENTON

ULRICH GLASNER
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NEIL EGAN
AUDREY PHELAN
PETER LIU
NGAIRE WATSON
GLENYS RULE

RHYS HOLDING
RICHARD WHITSED
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Murray Gibb

Why Freshwater is a Key Resource

There is a growing awareness of the increasing pressure on the world's freshwater resource, and the effect this will have on global food supplies. Unless there is a breakthrough in new sources of very cheap energy allowing desalinated water to be used for irrigation, we are stuck with a fixed supply. The freshwater we now have is all that is available.

Just how much pressure this resource is under isn't widely appreciated. If it was, we New Zealanders might be a little more sanguine about our future. Globally, demand for available water is increasing from three sources; increasing population, increasing urbanisation, and increasing living standards.

Take each of these in turn.

Firstly, last year the world's human population reached 7 billion, a year earlier than predicted. While rates of human reproduction are now slowing, the total population is expected to increase by another 40–50% in the next 50 years and not reach a stable state until some point well beyond that. Increasing population increases overall demand for water, with the average water requirement per person across the globe being 1243m³ per annum.

Secondly, society is becoming more urbanised. In 2009, for the first time more people lived in urban rather than rural communities. Sixty percent of the world's population will be urbanised by 2030. Urban populations can't grow their own food, and rely on reticulated water supplies and wastewater services. Both factors increase the demand for water.

Thirdly, across the globe we are becoming wealthier. Higher living standards equate with a greater demand for meat and dairy products, which require more water to produce than cereals. As humans

become wealthier and their diets change, their demand for goods and services also increases, so per capita use of water increases exponentially rather than at a linear rate. While the world's population trebled in the 20th century, water use during this period increased six fold.

These trends in increased demand will continue. Is there enough water to satisfy demand?

In 1996 Postel et al¹ estimated humans already used 54% of the global annual water runoff that is geographically and temporally accessible. They suggested this would increase to over 70% by 2025. Building more dams for harvesting and storing water would increase supply, but this comes with associated economic, social and environmental cost. They also pointed out that the share of evapotranspiration able to be appropriated for human activity would not increase, since the quantity of available dry (non-irrigated) land for farming is fixed.

What hasn't been quantified is the decreasing availability of water as a result of declining water tables, desertification, salinisation, pollution and climate change. Many countries are over pumping aquifers and struggling to satisfy their growing water needs, including the big three grain producers, China, India, and the United States.

Dry lands occupy 40% of Earth's land area containing 2 billion people. Between 10–20 per cent of this area is degraded. Nearly one third of the world's cropland has been abandoned in the past 40 years because erosion has made it unproductive. The total area affected by desertification is now estimated to be between 6 and 12 million square kilometres, increasing by an estimated 200,000 square kilometres annually.

Salinisation is also reducing the land available for agricultural production worldwide, especially in arid and semi-arid climates. Estimates vary from 20,000 to 100,000 square kilometres annually.

Overall water quality is declining worldwide by whichever measure is used, mainly as a result of intensification of land use for agriculture. Quantifying the effect of pollution on limiting water availability is not possible.

While there is enormous uncertainty about climate change and its effects, modeling indicates regional effects. Dry areas will get drier and wet areas will get wetter.

Demand side pressures coupled with fixed or reducing supply are putting the resource under pressure. Is there enough

“Globally, demand for available water is increasing from three sources; increasing population, increasing urbanisation, and increasing living standards.”

water to satisfy demand going forward? That remains to be seen. Some argue there will be enough. Others, such as science writer Fred Pearce, in his 2005 book *When the Rivers Run Dry*, and Britain's Chief Science Advisor, Sir John Beddington, draw these strands together and point to a more bleak picture.

Whatever the case, institutional policy settings will require radical revision. In the meantime New Zealand is very well placed. Available water runoff per capita here is amongst the highest in the world, and rates of abstraction are amongst the lowest. Our rainfall averages 2 metres annually, 2.5 times the global average of 800mm.

We have young and fertile soils, a temperate climate, abundant water and a knowledgeable cadre of food producers. That should sit well for us and our children. ■

Murray Gibb
Chief Executive, Water New Zealand

Footnote

¹Postel, S.L., Daily, G.C., and Ehrlich, P.R. Human appropriation of Freshwater. *Science*, New Series, Vol 271, No. 5250 (Feb 9, 1996), 785-788.

NEXT ISSUE OF WATER

The next issue of *WATER* will be in mailboxes mid-November.

The topics for the November issue will be Water Quality and Community Awareness and Engagement of Water Issues.

If you wish to contribute an article or photos please contact the editor, Robert Brewer, on +64 4 473 8054 or email robert@avenues.co.nz

The deadline to submit material is 8 October 2012.

2012

WATER

CHALLENGES & OPPORTUNITIES

WATER NEW ZEALAND'S ANNUAL CONFERENCE & EXPO
ENERGY EVENTS CENTRE ROTORUA 26 – 28 SEPTEMBER

STILL TIME TO REGISTER!

Conference Registration

Conference Registration is still open for *Water New Zealand's Annual Conference & Expo 2012* at www.waternz.org.nz

The Conference programme is on the website and can be downloaded from www.waternz.org.nz/annualconference_current.html

Conference Theme and Highlights

A challenging, interesting and future focused programme has been put together for this year's conference

programme with the core theme being **'Water Challenges & Opportunities'**.

This year's conference will offer over 90 presentations covering every aspect of the water environment and its management. The conference will have three primary streams plus Modelling and Operations streams. Also included this year, the ASTT Trenchless Technology stream – focusing on leading-edge science relevant to the water sector.

The *Water New Zealand Annual General Meeting* will be held on the Friday morning followed by a panel discussion.

Conference Expo

Exhibition sites have sold out with a record number of sites this year and over 100 different exhibitors. The Conference Expo continues to be the largest trade exhibition for the sector.

Expo Visiting Times

Visitors are welcome to come along to the Energy Events Centre in Rotorua to walk through the trade expo. Visitors must register at the Registration desk on arrival to be issued with a visitors pass.

Please note the times listed below when visitors will have access to the Expo area.

Access to the Expo is during these times only, there will be no exceptions.

Wednesday 26 September

9.00am – 10.00am
11.00am – 12.00pm
2.00pm – 3.00pm
4.00pm – 5.30pm

Thursday 27 September

9.00am – 9.30am
10.30am – 11.30am
1.30pm – 2.30pm
3.30pm – 5.30pm

Friday 28 September

9.00am – 12.00pm
Friday morning is set aside as an exhibitor visitor morning and will be a great opportunity for exhibitor/client meetings

Networking Opportunities

Social functions throughout the Conference continue to provide a prime networking opportunity.

ABB Limited Welcome Reception

Wednesday 26 September, 5.30pm
Exhibition Hall, Energy Events Centre, Rotorua

Applied Instruments Group

Operations Dinner
Wednesday 26 September, 7.00pm
Skyline, Rotorua

INNOVYZE Modelling Dinner

Wednesday 26 September, 7.00pm
Millennium Hotel, Rotorua

Conference Dinner and Awards Ceremony

Thursday 27 September, 7.30pm
Bay Trust Forum, Energy Events Centre, Rotorua

Water New Zealand Awards 2012

The following awards will be presented at the 2012 conference:

- CH2M Beca Young Water Professional of the Year
- Hynds Paper of the Year
- AWT Poster of the Year
- Ronald Hicks Memorial Award
- Opus Trainee of the Year
- Orica Chemnet Operations Prize

Water New Zealand Modelling SIG AGM

The 2012 Annual General Meeting for the Modelling SIG will be held during the Annual Conference on Wednesday 26 September 2012 at 1.30pm in the Energy Events Centre, Rotorua.

Water New Zealand Backflow SIG AGM

The 2012 Annual General Meeting for the Backflow SIG will be held during the Annual Conference on Thursday 27 September 2012 at 12.00pm in the Energy Events Centre, Rotorua.

Water New Zealand AGM

The 2012 Annual General Meeting will be held during the Annual Conference on Friday 28 September 2012 at 9.00am in the Energy Events Centre, Rotorua.

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STREAT CONTROL



Support Water Research on Grid Technology

Water is the most abundant resource on Earth, yet the world faces many challenging, water-related problems. More than 1.2 billion people lack access to clean, safe water, and 2.6 billion have little or no sanitation. Millions of people die annually from the results of diseases transmitted through unsafe water.

World Community Grid (www.worldcommunitygrid.org) is a secure, worldwide public network of computers supporting scientific research. Right now, World Community Grid has three research projects related to water.

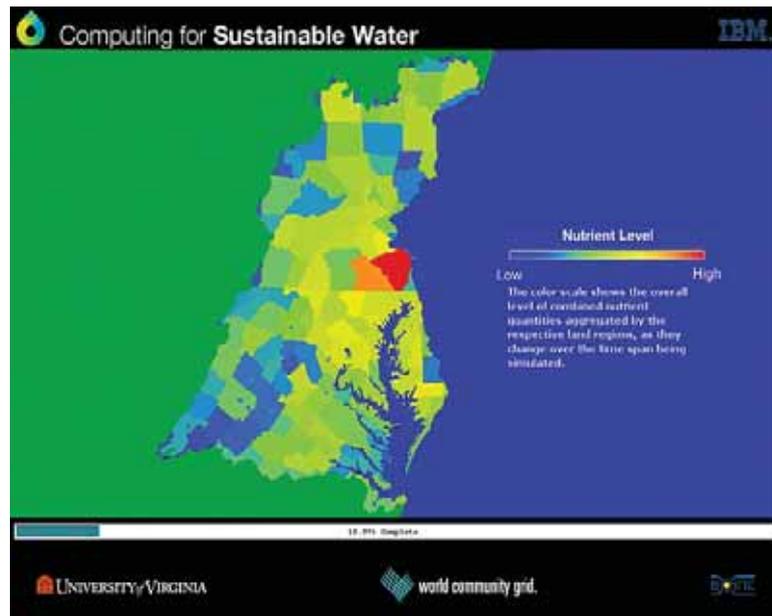
One initiative by the University of Virginia, "Computing For Sustainable Water", simulates how human behaviours and ecosystems relate to one another in watersheds such as Chesapeake Bay. The project will simulate and analyse the results of choices made by the competing interests of fishermen, farmers, urban developers, forestry experts and conservationists.

The findings from this project may have implications for 400 other major waterways worldwide – half of which are under stress.

A second project, "Computing For Clean Water" under the jurisdiction of Tsinghua University China, is looking to produce more efficient and effective water filtering. Researchers are also participating from Australia's University of Sydney and Monash University, and the Citizen Cyberscience Centre, Switzerland. The idea is to develop ways to filter polluted water with less expense, complexity and energy than current techniques.

"Research time can be reduced by more than 50 per cent through access to the vast communal supercomputing power of World Community Grid."

The third project, "Say No To Schistosoma" advances research on treatments for a neglected tropical disease caused by parasitic worms transmitted by freshwater snails.



Screensaver image for World Community Grid project showing a map of the Chesapeake Bay watershed being simulated

"Grid technology is simple and safe for everyone to use. You register on the World Community Grid website, and download and install a small, secure program onto your own computer."

To speed up the time of the research, reduce expenses and increase the precision of these projects, scientists are using the IBM-supported World Community Grid to perform online simulations, crunch numbers, and pose hypothetical scenarios.

Research time can be reduced by more than 50 per cent through access to the vast communal supercomputing power of World Community Grid.

The computer processing power of World Community Grid is provided by a grid of 2.1 million registered computer devices from more than 600,000 volunteers around the world. These computers perform the computations for World Community Grid projects when the machines would otherwise be underutilised.

IBM donated the server hardware, software, technical services and expertise to build the infrastructure for the World Community Grid, and provides free hosting, maintenance and support. World Community Grid members are donating over 350 years of run time a day.

How World Community Grid Works

Grid technology is simple and safe for everyone to use. You register on the World Community Grid website, and download and install a small, secure program onto

your own computer. You then select the research projects you'd like to support. Next, your computer will request a small piece of work from your selected research project on the Grid server. When you are not using your computer, it will start performing computations on the requested data, send the results back to the server and ask for a new piece of work.

The work is done using unused computer power. As soon as you start using your computer, the computations pause.

Join World Community Grid and Support Research

As world concerns grow over managing our freshwater resources, and providing sustainable water to nurture the global population, you can support research being conducted on these issues by joining World Community Grid. Simply register on www.worldcommunitygrid.org

If you'd like more information before you register, check out the Frequently Asked Questions on the World Community Grid website. Or you can contact Liz Hampton, Corporate Citizenship manager at IBM New Zealand. ■

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EERST – Teaching Kids and their Families to Respect Water

Kelly Moselen – Project Coordinator, Water4Schools

A non-profit Trust in the Bay of Plenty has recently rolled out a new approach to water conservation education in schools. The Environmental Education for Resource Sustainability Trust, known as EERST (pronounced as "er-ssst") created the Water4schools programme and implemented it in eight schools and preschools throughout the region as a pilot for what they hope to roll out in other areas around the country.

“The Water4schools programme donates water tanks to schools to provide a practical learning tool for the schools to use that actually helps them conserve water.”

The Water4schools programme donates water tanks to schools to provide a practical learning tool for the schools to use that actually helps them conserve water. The tanks are also promoted as an additional water supply for the community in times of civil defence emergency. The overall goal for the Water4schools programme is to increase the value that the students and school have for the water they use.



Paengaroa Primary School with their newly delivered tank. The tank water will be used to help keep the school pool functioning and for the school's toilet block.

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“Children easily grasp this simple message and with further investigation they start to look at how they use water when they are going about their lives. The water meters allow for the students to watch and see how the water is used, and how far it goes.”

The next step for Water4schools is to assess the schools over the coming months to see what progress they made from their original consumption. EERST will take these results (anticipated to be positive!) and continue to seek funding for the next stage of the programme. The initial pilot received funding from BayTrust for the tanks, Pub Charity for education, discounted tanks from Devan Tanks and discounted plumbing supplies from Plumbing World. Schools were asked to contribute 25% of the cost of their chosen tank and to arrange installation. The EERST Trust also contributed to the overall cost.

There is a clear need for tanks in schools. Schools all over the country wanting to participate in the programme regularly contact the EERST Trust. The educational and environmental benefits of using tanks in schools are obvious. The potential for financial savings is just another reason for schools to add water tanks to their infrastructure. ■

Each school applying to the programme had to have a wider plan in place for water conservation so that the tank complemented what they were already aware of and working towards. The tanks ranged in size from 1,000 litre, 5,500 litre, 15,000 litre and 30,000 litre and each school selected what size they preferred, where it would be installed and what it would be used for.

Some schools choose to utilise their tank for water play, gardens or for a toilet block. Every tank also had a water meter installed so that the students could monitor usage. An education component is delivered to the schools by EERST after the tank has been installed so that the message is further reiterated.

Water tanks, as a way to reduce consumption, work by raising awareness by making water a tangible and valuable asset. If the tank is empty there's no water play, or their garden can't be watered.

Children easily grasp this simple message and with further investigation they start to look at how they use water when they are going about their lives. The water meters allow for the students to watch and see how the water is used, and how far it goes. Students also learn that the rain destined for that piece of land is incredibly valuable and shouldn't be lost down the stormwater drain.

Research completed by EERST before the programme began found that water consumption varied widely between schools of similar size within the district. Two high schools in the Bay of Plenty with similar student numbers were assessed with the first school using 10.6m³ per student per annum, with the second school using only 1.7m³.

Neither school was aware of what they were doing that reflected their usage, however after being contact by EERST the high-using school investigated and found a major leak. Schools receive their funding from the Ministry of Education for their annual costs and without the comparison of other schools of similar size it is difficult for the schools to know if they are a high-user or not. The variables within the schools include old vs. new infrastructure, whether or not they had a swimming pool or urinals, the type of toilets they have and how they cleaned the school (i.e. some schools water blast the exterior of the buildings to clean).

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What the New Zealand Maori Council Case Could Do for New Zealand

Stephen Franks, Principal, Franks and Olgvie



Stephen Franks

In this issue *WATER* asks lawyer and former MP, Stephen Franks, to outline his views on the implications of Maori claims against water assets. The following article was written prior to the release of the Waitangi Tribunal's decision.

The New Zealand Maori Council claims that the sale of shares in the electricity SOEs will make it harder for the Government to respect Maori property rights

in rivers. Allegedly, private share-holders could make it harder to reverse the state hydro dam builders' expropriation of control rights, or make it harder to impose compensating water use charges.

The NZMC has not tried to hide the opportunism in this claim. This is a polite legal hold-up. The Crown has talked about defining Maori rights in rivers for decades, but meanwhile acts as if it owns them. The claim to rights of some kind in some parts of some rivers is strong but the argument is very thin that the sales will affect any of those rights. Thinness has not in the past stopped the Tribunal from giving claimants tactically helpful conclusions.

Tribunal thinking is well signalled in previous reports on rivers. It is almost certain to hold eventually that some Maori rights in some rivers have been breached. That conclusion is justified by the papers before them, and astonishingly the Crown has effectively conceded the point without making many of the limiting arguments. It is hard to work out what the Crown thinks the Maori rights should mean.

On the merits of a properly argued case applying the law bargained for in the Treaty, most customary interests will have expired decades ago. But judging from the capitulation in the Marine and Coastal Area (Takutai Moana) Act 2011 (the current Government's replacement for Sir Michael Cullen's Seabed and Foreshore Act) those arguments will never be put.

The New Zealand Maori Council does not necessarily need a solid legal platform. A severely limited decision can be translated by political rhetoric into a sincere grassroots Maori conviction of a conclusive finding in their favour. Appeasement does the rest. Ngati Apa' was a Court of Appeal decision that some iwi retained rights to an arguable case (to be heard by another court) for rights akin to ownership of some limited areas of seabed and foreshore where they had continuing practical use and control. That preliminary decision has now been converted to extensive rights to shared control and economic exploitation, without the underlying case ever having been completed. Pakeha leaders found it impossible to call out Maori leaders for failing to correct misleading descriptions of the limited scope and the flimsiness of the claims.

The Crown is putting all its bets on persuading the country, including Maori, that Maori interests are not affected by the share sales. It should succeed, but it may nevertheless not quell the storm. Tribunal comments on the underlying rights may uncork pressure that will not relent.

Silver Lining

If the Waitangi Tribunal agrees with the NZMC, and the pressure to appease drives the Government to negotiate, there may yet be a silver lining for all New Zealanders.

An urgent negotiation between the NZMC and the Crown could crash through the barriers to creation of a simple property rights regime for water management. The overall social gains from creation of genuine property rights could provide enough surplus to buy-off the NZMC (or iwi) and leave us all better off, without a budget impact. Given political aversion to the "o" word (ownership) the rights may need a new label, but ownership is a broad church. Reasonable permanence of exclusivity of benefit plus transferability will do.

"The Crown has talked about defining Maori rights in rivers for decades, but meanwhile acts as if it owns them."

A panicky political deal could do the opposite, and cement New Zealand into a high cost, low benefit, constantly renegotiated water allocation regime². It could foster continual 'rent review' disputes and attract a stream of new rent seekers. That would recreate many of the defects in property rights from which the Treaty and British law in 1840 promised an escape³.

This note accordingly discusses features that would distinguish a valuable long term regime from a problematic one. People whose futures depend on clear water rights should get ready to help the government hold to important bottom lines. All over the world the water commons is being "enclosed" as water becomes recognised

as a scarce and valuable resource. There is plenty of experience to draw on. New Zealand may have set out to invent something unique to avoid stirring up Maori claims to ownership, but that cat is out of the bag, so we can now go to proven models.

The Land and Water Forum Work

Many attributes of good water management regimes have been explored by the Land and Water Forum. It has exhaustively established agreement that water scarcity requires rationing and water quality requires standards, that each catchment needs its own plan, and that it is desirable to have a broad consensus among the stakeholders of each catchment in support of the plan. But the Forum has so far avoided (publicly at least) the big issue – how do individual people and businesses and communities get and hold and lose or transfer the benefits, costs and rents from rights to use water. How do we ensure transaction costs do not blow out? Essentially, the Forum has yet to say how its system will not bog down under opportunities to do just what the NZMC is doing now, use legal tactics and cunning politics to take existing or future rights from others. The fine print operational details of property rights systems are everything. So far Forum reports have hardly touched on them.

Forum reports show exaggerated respect for abstract Maori principles but a search for simple words such as 'property' or 'ownership' or even 'rights' suggests the Forum must have been under an (Alastair) Cleese protocol "don't mention the [water ownership] war".

This is not necessarily a criticism of the Forum. It is common sense to work first on things that can be agreed, to develop habits of cooperation and good faith discussion before tackling the really knotty issues. Even if ownership has been the taniwha-in-the-room

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“If the Waitangi Tribunal agrees with the NZMC, and the pressure to appease drives the government to negotiate, there may yet be a silver lining for all New Zealanders.”

up to now, the next report will explore transferability⁴. That must deal with many if not all of the elements that together constitute and define property rights.

After the Taniwha has Woken

Thankfully the NZMC are rational. Hold-up tactics gained for Maori 20% of the quota on the creation of New Zealand's world leading fisheries management system. They worked again in relation to broadcasting spectrum, and more recently when aquaculture territory was expanded. The NZMC has made it plain that redress for offence to Maori rights can be tangible. They will withdraw their action for a suitable price, perhaps a percentage of the SOEs. Given that Maori have been long encouraged to frame their wishes in semi-mystical and rarified terms such flexibility attracts criticism as venality, but we should all be relieved at pragmatism. Reaching a rational water rights regime could be vastly less likely without it.

Maori pragmatism is also historically respectable. The Treaty signatories had more pressing and practical goals than a spurious 'partnership'. Kaitiakitanga, or co-management may flatter a Maori elite but the smoke-and-mirrors of governance is not the substance of the ownership they were promised.

The Crown has shown repeatedly that it would rather do a deal than subject our politics to the drawn out uncertainty of court determination. Elected politicians fear judicial political naivete, and Dickensian delay. But most importantly courts may only address facets of a dispute⁵. A political/legislative deal can be comprehensive (though loopholes have always been found in full and final settlements).

Bottom Line Lessons of Experience

So what are the features that would make valuable a 'crash' recognition of ownership rights to water? What issues are secondary, and can be safely postponed, remembering that hard issues become harder the more clearly value hangs on them, and the more people who begin to have competing expectations?

Generosity of spirit is much easier when everyone is first sharing a windfall. Speed combined with hard-headed realism might minimise the risks of a hasty political deal, or an under-informed court decision that could lock in damaging features.

- a) The Treaty promised classical English property law to Maori (and "all the people of New Zealand" in its words). It was instead of pre-existing rules.
- b) Most property rights regimes start by regularising "finders keepers" trumped by "use it or lose it" and often strongest wins".
- c) The Maori customary concept of "ahi kaa" embodied all three.
- d) The label of a right is not determinative – confirmed, transferable exclusive rights to use water can have the same legal substance as ownership of water.
- e) Ownership is usually more simple and powerful in stewardship terms than the alternatives. Owners take more interest in not wasting and maximising the useful value of their asset and in

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preserving its continuing availability than people with term limited and conditional use rights.

- f) Water infrastructure tends to be expensive and long term. Water use assets are often sunk capital that is vulnerable to uncompensated changes in rights (expropriation). Clear ownership rights reduce that risk and therefore the cost of such assets.
- g) Politicians and officials, on the other hand, prefer rules that leave in their hands the political levers of periodic licencing and reallocation.
- h) The politics of water access and usage mean that most stakeholders are incentivised to resist change, because there is no mechanism for them to be sure of sharing in any of the gains from change.
- i) That applies particularly to the mass of voters, who draw only nominal benefits from the natural state of rivers – relatively few swim or fish so their enjoyment is largely the mind comfort of the status quo.
- j) Maori, as a minority in a democracy, are (like farmers and other commercial users) vulnerable to periodic re-allocation within political reach. The last 20 years of respect for indigenous rights is historically anomalous. Politicians who will claim to speak for greater numbers will gain (politically) from promising expropriation of minority interests for majorities.
- k) Maori interests in genuine property rights in water therefore coincide with business users and others who can make long term investments only if they know they will not face periodic exploitation of their sunk asset vulnerability.
- l) Maori were promised English property rights – Article 2 expected them to use and develop their land and sell surplus assets. It did not pickle tribal forms of influence that could not readily translate to useful property.
- m) English law was unsympathetic to long term veto rights on land uses. It was hostile to long running restrictive covenants, and to locking up land in the hands of trustees. The rule against perpetuities (trusts lasting longer than a life in being plus 21 years) reflected the experience of centuries, that saw land held by absentee or non-beneficiary owners being less well managed than it should be.
- n) English law was not especially friendly toward owners and groups constituted in ways that made it hard for them to accept socially optimising economic value. Individualisation of titles reflected an early recognition of the problems with collective ownership since described in the catchy phrase “tragedy of the commons”.

Specific Warnings

If urgent negotiations are triggered by the NZMC claim, then avoid jibes that will turn into own goals. Rights should leave their holders with an ability to extract value other than the psychic satisfaction of vetoing changes to the status quo. They should ensure that holders can value their rights, and earn a return on that value. So, for example:

- a) Reject intangible claims if the law cannot make them proprietary, unless they are insignificant. Affirmations of mana and co-management will be seen by future generations as insulting – acknowledgements of rights without effective compensation for taking them.
- b) If negotiators have to emphasize the intangible (spiritual) dimensions of concerns to get around the absence of remaining connection that would sustain common law or customary titles, then ensure they are either convertible to economic claims, or confer no rights that allow veto or delay tactics.
- c) There should be few intangible rights that matter if common/customary/ahi kaa law is applied. The simple ‘ownership/

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economic' rights that custom and common law would respect have been largely exercised by civil authorities or by neighbouring landowners for a long time, so they have been lost;

- d) Expect ceremonial roles, in planning and implementing visions and management plans to either fall into disuse because race defined input is redundant, or to grow with political action into valuable hold-out rights.
- e) Paying rentals to overcome hold out rights may be aggravating and unjust, but it is better than having no way round them. Do not force local authorities, or Maori authorities or other trustees for third parties to pledge not to turn the rights to profit for their beneficiaries.

Set Aside Windfall Assets and Rents to Nurture the Rights

The fisheries quota management system has funded research to maintain and improve the value of quota. For a water regime such funding independent of central and local government could be even more useful.

The introduction of a property regime releases value because it reduces the uncertainty risks and barriers to investment. For example, generators should be prepared to pay in one sum or annually much of any increase in their asset value from water rights that last the life of their dams, instead of 35 years. There are many similar possibilities for using initial allocations to allay fears:

- a) Rents should fund independent bodies to produce scientific and economic reports on aquifers and on projects to maximise water availability and quality;

“...the [Land and Water] Forum has so far avoided (publicly at least) the big issue – how do individual people and businesses and communities get and hold and lose or transfer the benefits, costs and rents from rights to use water. How do we ensure transaction costs do not blow out?”

- b) Such centres of knowledge should consciously balance the debate with those whose primary value system is the 'precautionary principle' and resistance to change;
- c) Rights should be genuinely and freely tradable subject only to competition law restrictions on the acquisition of dominant holdings that could create unnecessary monopoly;
- d) Recreational users should hold a substantial part of the value of their current hold-up power. For example clubs or trustees for fishing and kayaking and other recreational users could hold quantified and tradable rights or flow quota, within strict limits on purpose:
 - a. So that people can see just what implicit economic value is being given to them (seeing how large is the privilege demanded by those who want rivers and lakes unchanged or returned to some pre-human state);

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- b. So that rivers, streams, drains and creeks that are rarely if ever used for such purposes can be released with the benefit enhancing the recreational values of those that are more suitable. For example, many small streams flow directly to the sea. Their pristine water may never be used in ways that reflect the cost of preserving that quality from some level of nitrate content;
- c. So that groups like Fish and Game, or local authorities, or national or regional sports organisations can spend annually rents from waivers of their power to veto water uses. For example they might release water in a catchment or stream to finance fish ladders or hatcheries or artificial kayak slalom courses near cities, or in buying out existing use rights that degrade rivers that would otherwise be more valuable;
- e) Minimise absolute preservation rights that cannot be usurped with compensation, for example under the Public Works Act, for essential services or better collective uses. The Land and Water Forum has recorded that the scope for the Environment Court to vary or overturn a local deal on water restrictions remains not agreed;
- f) Establish model mechanisms for collective management of interdependent rights, whether the managers are iwi, or companies. They should contain supermajority provisions for 'major transactions' or material changes of direction, subject to buyout rights (compensation to dissenters that excludes hold-out value).

The opportunities are exciting. The NZMC action may have sidestepped the Forum's attempt to reach consensus with iwi leaders. Let us hope that the Government is ready to gain advantage for us all out of that breaking of the mould. ■

Footnotes

¹Attorney-General v Ngati Apa [2003] 3 NZLR 643

²The Land and Water Forum advocates 'agility' in water regulation, and 'collaborative' management. It is not clear that it has appreciated the extent to which uncertainty and delay are the unavoidable corollary of opportunities to renegotiate and to dicker for political advantage.

³Article 2 of the Treaty offered "all the ordinary people of New Zealand" the then world leading legal 'software' of British property rights. Ownership did not depend on continual defence against intruders. You were relieved from pay-offs and currying favour with your neighbours, your rulers, or leading priests, to change the use of a property.

The UK was uniquely placed to offer Maori a model for transition from the now universally recognised problems of collective ownership. A 'tragedy of the commons' loomed with immigration's population pressure. English lawyers had quarried property rights from custom and from Roman law. The rights were refined with experience, and the occasional revolution (like Henry VIII's confiscation of church lands). The Crown's exclusive right in Article 2, to buy property from Maori, was intended to protect ordinary Maori from the kind of dispossession suffered by Scots as their lairds converted the highland commons to sheep rearing.

⁴Report no 3 is scheduled to cover "How to manage within limits by developing more effective methods and strategies for allocating water, including trading and/or transfer systems".

⁵The Supreme Court decision of 27 June 2012 in *Paki and others v Crown* held that Pouakani have enough case to be heard on whether they own part of the bed of the Waikato. The comprehensive statement of claim was filed in September 2005. Harrison J delivered the High Court judgment on 30 July 2008, after five days of hearing. After three days before the Court of Appeal that Court gave judgment on 11 December 2009. The Supreme Court heard two days of appeal argument in March 2011. They delivered their procedural judgment 15 months later, dealing in principle with only 1 of 7 contentious issues decided by the High Court.

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New Reticulation Workshops Make Big Impression

Stephanie Robertson – Communications Advisor, AgITO

Water Industry Training's updated National Certificate in Water Reticulation (Level 3) sets a new benchmark for training in the industry the organisation's manager, Annie Yeates, says. This is a view backed up by attendees of Water Industry Training's recent workshop for assessors of the qualification. Selwyn Osborne of Carterton District Council and Len Williams of Castlecorp say the assessors were impressed by the improvements to qualification and that it's now more relevant to the industry than ever.

The assessors spent two days in Wellington going over changes to the qualification. The recently revamped qualification now includes updated learner resources and a practical, hands-on trainee workshop.

"We are really excited about the updated qualification," Annie Yeates says.

"We believe it offers the best training experience yet for trainees and the best training outcomes for employers. We have totally revamped and redesigned the learning resources and integrated a hands on practical workshop into the off job training.

"Changes include resources with more relevant photos, diagrams and exercises to better engage trainees."

"Our assessors recently came together to trial the new reticulation workshop which will be rolled out as part of block three of new delivery programme."

Changes include resources with more relevant photos, diagrams and exercises to better engage trainees. The resources also include literacy and numeracy conventions and activities which meet the



Using a chlorine comparator kit (left to right) – Geoff Horler – Hurunui District Council, Martyn Simpson – Water Industry Training and Len Williams – Castlecorp

requirements for NCEA 1, 2, and 3. The new and improved block courses include presentations from manufacturers and practical workshop sessions where trainees carry out practical skill sessions in hands-on, scenario based activities.

"Trainees now have to apply what they have learned in the classroom into their daily activities before they can be signed off on a task," Annie Yeates says.

Selwyn Osborne, reticulation team leader for Carterton District Council, attended the assessors' workshop.

"We were guinea pigs for the new trainee workshop," he says.

"What they're doing now is getting a practical section in there where trainees have to join bits of pipe together and show the fittings. It's one thing for a tutor to show it in a book, but guys who go on the course will get to do this practically now – they'll experience more and do more hands on learning."

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“The recently revamped qualification now includes updated learner resources and a practical, hands-on trainee workshop.”

Selwyn has completed the reticulation qualifications at Levels 3 and 4 himself and says the new version of the qualification is significantly improved.

“There’s a vast improvement, especially with the photos in the resources which relate more to work trainees are doing now. I did my qualification in 2004 and this would have been a help to me.”

Selwyn’s team members must complete the Level 3 qualification and says councils are now stipulating that people who work on their assets have the qualification under their belt.

“I strongly believe in the qualification. It’s a measure of someone’s ability to do a particular job. I’ve found Water Industry Training very good as far as help goes when I needed it. There’s always someone there that you can turn to,” he says.

Utilities and Works Operations Manager for Castlecourt, Len Williams, was also at the assessors’ workshop and agrees with Selwyn.

“The workshop was really valuable, it’s good to have all the guys in the same room,” he says.

“I’ve been an assessor for a long time, and I have mentored a lot of staff. All of our utilities staff are doing training, it’s part of our job requirements – if you come on board fresh and know nothing we expect you to gain the qualification.”

Len believes the new workshops are going to go down well with those enrolled in the qualification.

“I’m very impressed with the new qualification, it’s more relevant to what the guys are doing at work and is a good fit with the way we do business.”

To enrol or for more information about Water Industry Training’s qualifications, call your local training adviser on 0800 928 374 or visit www.waterit.ac.nz

About Water Industry Training

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Urban Metering – The Quest to Measure How Much Water is Being Used, and Also Being Lost

Kirsten Fraser – CH2M Beca

Most Councils in New Zealand do not have universal metering on their water supplies. There is no doubt that having universal metering can be used to manage demand, and it makes estimating the extent and location of losses much easier and gives greater confidence in the findings. However, the installation of meters for all consumers is expensive, and the decision to install meters is often controversial in itself.

- Changing a non-metered supply over to universal metering requires careful planning, both at a technical level and at the political level. Issues that need to be considered include:
- Council policies associated with meter installation and operation (e.g., how multiple occupancy buildings will be metered, policy on customer-side leakage)
- Meter type
- Procurement of meters, their installation, and billing systems

- Demand management advice for consumers
- Tariff structure
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- Public consultation

Auckland (as served by Watercare Services Ltd) has universal metering, serving a population of 1.3 million. Outside Auckland there are about ten Councils who have adopted universal metering and volumetric charging in whole or in part of their jurisdictions. The number of people served by these universal metered supplies outside of Auckland totals about 250,000. This means that about 40% of the population served by community water supplies in New Zealand are metered.

Both Kapiti Coast District and Central Otago District are currently implementing universal metering.

Many of the ten Councils that have already adopted metering have had some combination of population growth and the need to augment their supplies as the trigger for the adoption of metering. It is much easier to mount an economic justification for metering if the large capital project necessary for augmentation can be deferred by say 10 years through reduced demand.

Metering can also be used to better understand and estimate the extent and location of losses. Indeed, by its very definition as "unaccounted for water", it is the only way of getting a real measure of the extent of losses.

Taylor (2011) presents a hypothetical example for a community of 20,000 which shows that water loss initiatives are more cost effective than metering for achieving comparable savings. In his example, universal metering costs \$6.1m and saves 2.3ML/day, compared with water loss initiatives costing \$1.5–2.0m and saving 2.5ML/day. He also argues that the opex will be higher for the metering option. Taylor's view is that both water loss initiatives and the introduction of metering should be implemented prior to supply augmentation.

Many Councils have made estimates of how much water is being lost through leakage, but often these estimates are just a hunch, as they are not based on any hard evidence. While it is tempting to say "we

don't have enough evidence because we don't have meters", it is surprising what can be done with what data is already available or can be gathered reasonably easily.

There are three methods that can be used to arrive at a reasonable estimate of losses without having universal metering. These methods are: minimum night flow monitoring, water balance (BenchlossNZ software) and comparing water demands with dry weather wastewater flows. These methods can give surprisingly good agreement and allow for a realistic, albeit approximate, estimate of the extent of water losses in a network.

Most Councils collect the type of information and data required, and could undertake this kind of assessment of water losses. The knowledge gained will aid both asset management and water conservation efforts, and can be used to design and drive a targeted leakage management programme.

"Outside Auckland there are about ten Councils who have adopted universal metering and volumetric charging in whole or in part of their jurisdictions. The number of people served by these universal metered supplies outside of Auckland totals about 250,000. This means that about 40% of the population served by community water supplies in New Zealand are metered."

The extent of the benefits from leakage management depends on each supply's specific situation. Typically, the early benefits are the obvious ones of reduced treatment and pumping costs, but if leakage management is carried further, it can be used to inform network renewals and prolong the life of existing assets through pressure control.

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“Not only can the potential options of leakage management be assessed in terms of water savings, but cost benefit analysis techniques can be used to calculate the payback period for the proposed options. A cost benefit analysis will demonstrate the financial benefits of reducing water losses, and allow an economic level of losses to be determined.”

its source, then successful implementation of leakage management practices can directly equate to the deferment of future water infrastructure capex.

Leakage management typically starts with the setting up of District Metering Areas (DMAs). Each DMA is a sub-zone of the network, set up so that the flow into each DMA can be metered. This allows areas of higher losses to be identified and better targeting of leak detection work. Hand-in-hand with the setting up of DMAs is better management of any areas of high pressure by setting up pressure zones with pressure reducing valves. Reducing network pressures will reduce leak flow rates on both public and private water pipes and may reduce the frequency of pipe bursts.

Pressure Managed Areas (PMAs) can be implemented on the back of a DMA design with the final stage of the design requiring

specification of meter and PRV sizes to suit expected demand ranges and pressures. Pressures taken at key locations (DMA inlet, average zone point and critical point) and flows measured at the inlet over a 24 hour period are processed and analysed using leakage-specific software. This software allows the user to determine excess pressures and flow in the DMA and thereby calculate the potential leakage reduction at an acceptable new lower pressure, to meet the target levels of service.

Not only can the potential options of leakage management be assessed in terms of water savings, but cost benefit analysis techniques can be used to calculate the payback period for the proposed options. A cost benefit analysis will demonstrate the financial benefits of reducing water losses, and allow an economic level of losses to be determined.

In summary, a realistic, albeit approximate, estimate of the extent of water losses in a network can be made with data that is already available or can be gathered reasonably easily. Without this first step, it is impossible to know what the losses in a network are. Once armed with this knowledge, an informed leakage management strategy can be developed and implemented over a realistic timeframe. This may well include the introduction of universal metering at some stage in the future. ■

Reference

Taylor, R (2011), *Urban Metering – Is There a More Cost Effective Solution to Reducing Water Demand?*, Water, July 2011.

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Reform Is In the...Water

Helen Atkins, Partner and Vicki Morrison, Senior Associate, Atkins Holm Majurey

Introduction

The last couple of months have been a very busy time for the Government. Significant steps have been taken in progressing the Local Government and Resource Management reforms; further reforms have been called for to protect wild and scenic rivers from hydroelectricity proposals; and there has been a storm of controversy over the proposed sale of state owned energy companies and the effect this has on Treaty claims to water. This article provides a brief overview of these developments as well as comments on a recent Environment Court case regarding the effect of the Treaty claim to water on water discharge consents. Due to limitations on space we will not (contrary to what we said in our last article) be profiling regional council approaches to water in this article but hope to do so in future articles.

Local Government Reform

As signalled in an earlier article, the Government's "Better Local Government" reform programme is now underway. In recent months three separate initiatives to support this reform programme have commenced. These are the introduction of the Local Government Amendment Bill; the Productivity Commission's review of Local Government Regulatory Performance; and the appointment of the Local Government Efficiency Taskforce.

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Local Government Amendment Bill

On 30 May 2012 a Local Government Amendment Bill¹ was introduced in order to refocus (and narrow) the purpose of local government, constrain spending, strengthen governance measures and streamline processes for council amalgamations and other reorganisation proposals.

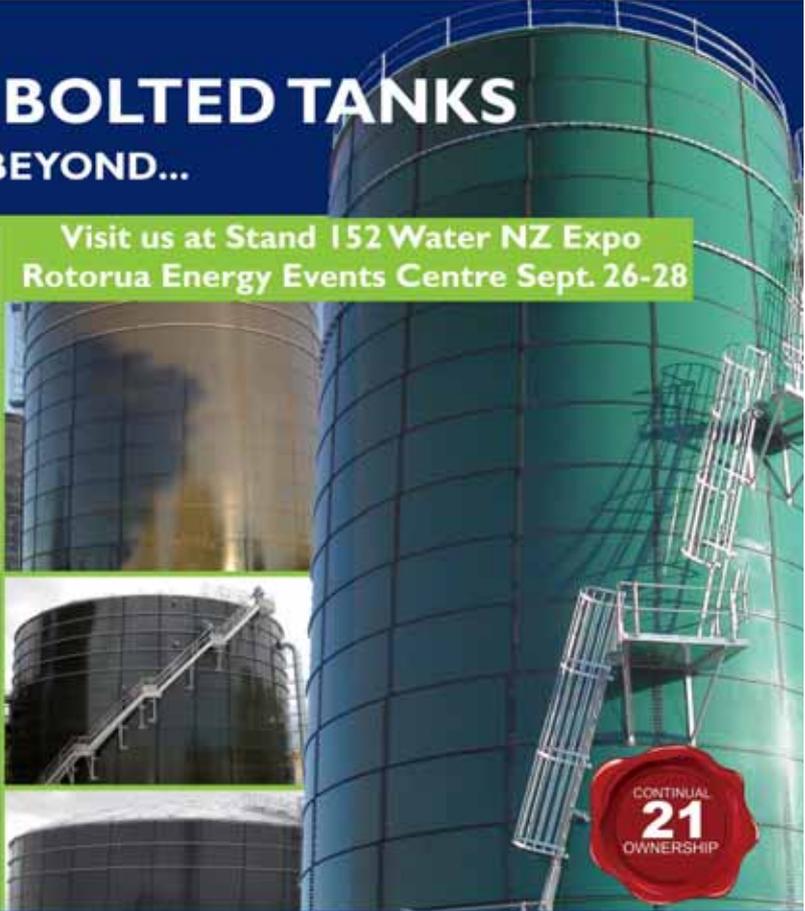
The key objective of the Bill is a more focused, efficient and cost effective local government sector. The Bill aims to do this by getting local government to effectively stick to its knitting – providing those core services which only it can provide – local infrastructure, local public services and regulatory functions – whilst leaving the provision

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“The other major change the Bill proposes is streamlining the process for local government reorganisation by abolishing the requirement for a referendum where 50% of the voters are in support. Any such proposal would still need to be able to demonstrate “significant” community support.

of wider social, cultural and other services to central government. The introduction of financial prudence measures – such as the setting of benchmarks – are intended to rein in Council spending and keep costs as low as possible. The Bill proposes to strengthen governance provisions by enabling graduated intervention by central government where local authorities are struggling, increasing the leadership role and powers of Mayors (in a manner similar to what has occurred in Auckland) and enabling Councils to determine policies on staff numbers and remuneration (whereas previously this was set by the CEO). The other major change the Bill proposes is streamlining the process for local government reorganisation by abolishing the requirement for a referendum where 50% of the voters are in support. Any such proposal would still need to be able to demonstrate “significant” community support. Just what significant means in this context is however left open.

The Bill completed its first reading on 12 June 2012 and was referred to the Local Government and Environment Committee for

consideration. Submissions on the Bill closed on 26 July 2012.

Predictably, reactions to the Bill have been mixed. Generally, the business sector has welcomed the increased accountability and limits sought to be imposed through the Bill. LGNZ and SOLGM however have expressed some concerns about the lack of justification for some changes and the potential adverse effects that could result from some of these changes. For example a discussion paper released by LGNZ and SOLGM indicates their view that there is no need to “refocus” the purpose of local government as Council’s already focus on core services and there has been no significant expansion to the services Council’s provide since the 2002 amendments. However, later in that discussion document it is noted that under the 1974 Act there was also a reference to community wellbeing meaning that broader community services could perhaps have already occurred under that earlier Act. It will be interesting to see what changes the Local Government and Environment Committee recommend to the Bill in their report which is due on 15 October 2012.

Local Government Regulatory Performance

In addition to the reforms proposed in the Local Government Bill, the New Zealand Productivity Commission has recently been tasked with undertaking a review of the regulatory performance of local government. The review considers the following three issues:

- How the allocation of regulatory functions between central and local government could be improved;
- How local government regulatory performance could be improved; and
- How local government regulatory performance is best measured.

As a first step in undertaking the review, in July 2012, the Commission released an issues paper entitled “Local Government Regulatory

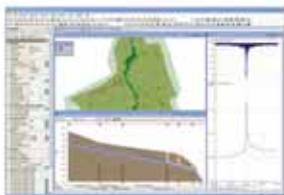
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Performance". The paper seeks responses to a series of questions (65 in total) regarding six key topic areas: the Commission's approach to the review; local government and regulation; regulatory variation between local government bodies; which local government body should regulate what; getting regulation right; and how regulatory performance should be assessed.

Submissions on the issues paper are open until 31 August 2012 with a draft report being due in December 2012. There will be a further opportunity for submissions on the draft report in early 2013 with a final report being due to Government by 1 April 2013.

Local Government Efficiency Taskforce

On 7 June 2012 the Local Government Efficiency Taskforce was appointed by the Minister of Local Government. The role of the taskforce is to advise on streamlining and reducing the costs of the planning, consultation and reporting requirements on local authorities.

The Taskforce is comprised of eight members who collectively have a broad range of experience in the local government sector:

- Michael Holm (Chair)
- Kerry Prendergast
- Michael Barnett
- Bill Bayfield
- Stephen Parry
- Pamela Peters
- Debbie Packer
- Vanessa van Uden

The taskforce is required to provide a draft report to the Minister of Local Government by 24 August 2012 and a final report by 31 October 2012. Taskforce members are also required to be available to provide oral advice to the Minister through to December 2012.

We will maintain a watching brief on the local government reforms and provide comment on any updates in future articles.

Resource Management Act Reforms

There have been two recent developments in the resource management field since the date of our last article: the release of the report by the Technical Advisory Group ("TAG") on sections 6 and 7 of the Resource Management Act 1991 ("RMA") and the introduction of an RMA amendment bill relating to the duration of certain discharges and coastal permits.

Technical Advisory Group Report on Sections 6 and 7

On 5 July 2012 the TAG Report on sections 6 and 7 of the RMA was released² ("TAG Principles Report").

The TAG had been tasked with providing advice to the Minister for the Environment as to whether sections 6 and 7 could be improved by³:

- Giving greater attention to managing natural hazard issues;
- Considering the recommendations from the urban and infrastructure TAG;
- Incorporating any relevant provisions of the Land Drainage Act 1908, Rivers Board Act 1908 and the Soil Conservation and Rivers Control Act 1941 ("Land and Rivers Legislation");
- Reflecting on the provisions relative to the resource management challenges 20 years on; and
- Promoting consistency of interpretation through clear and modern drafting⁴.
- The TAG Principles Report concludes that sections 6 and 7 could be improved by having regard to these factors (with the exception of the Land and Rivers Legislation which is instead recommended for repeal and inclusion within the Local Government Act 2002).
- The key recommendations of the TAG Principles Report are that⁵:

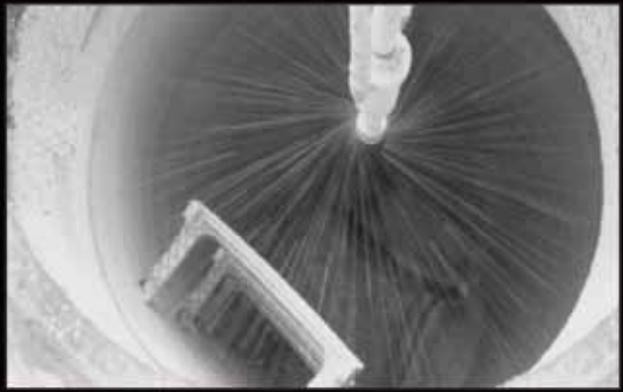
- Explicit mention be made of the overall broad judgment that is required to achieve the purpose of the RMA.
- Section 6 be amended to recognise and provide for the sustainable management principles which are relevant to the overall broad judgment by:
 - » Including most of the matters currently contained in sections 6 (matters of national importance) and 7 (other matters) but in a more consolidated summarised form;
 - » Excluding references to certain matters – such as stewardship, efficiency of the end use of energy, amenity values, intrinsic values of ecosystems, quality of the environment and the habitat of trout and salmon – to avoid duplication or provide a more concise focus; and
 - » Including references to a number of new matters – namely natural hazards, biodiversity, wetland values, economic, urban and infrastructure issues as well as taonga species.
- Section 7 be replaced with a new section setting out sustainable management methods which decision makers are required to comply with, including:
 - » Timely, efficient and cost effective resource management processes;
 - » The use of concise and plain language;
 - » The avoidance of repetition;
 - » The recognition of environmental compensation / offsetting proposals;
 - » The promotion of collaboration between local authorities; and
 - » The achievement of an appropriate balance between public and private property interests.

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- New definitions be included for the terms used in sections 6 and 7 including:
 - » Natural character;
 - » Archaeological site;
 - » Historic place and historic areas;
 - » Mitigation;
 - » Outstanding natural features and outstanding natural landscapes; and
 - » Areas of significant indigenous biodiversity, areas of significant indigenous terrestrial habitats and areas of significant aquatic habitats.
- In relation to natural hazards, in addition to inclusion in section 6:
 - » The Government promulgate a national policy statement and / or national environmental standard for natural hazards;
 - » Regional policy statements and plans be required to consider civil defence emergency management plans;
 - » Regional Councils be confirmed as having primary responsibility for managing the effects of natural hazards but territorial authorities to retain their existing functions;
 - » Each region is to have one combined regional and district natural hazards plan which is to be operative within three years of the enactment of the empowering legislation;
 - » Each local authority be required to make natural hazards information available to other local authorities within their region (overriding any privacy or official information legislation to the contrary);
 - » The definition of natural hazards in the RMA be retained but that consideration be given as to whether there is any need to amend the definition in the RMA and / or other legislation for consistency;

“There has been a significant amount of coverage in the media lately of the Treaty claim to water resources and the impact that iwi and hapu interests in these resources may have on the proposed sale process of the state owned energy companies.”

- » Section 106 (which relates to the refusal of subdivision consent in certain circumstances) be amended to refer to liquefaction, lateral spreading and the consequences and risks associated with other natural hazards; and
- » Consideration be given to whether section 106 could be extended to apply to regional land use consents.

The TAG Principles Report is currently being considered by the Government as part of the phase 2 RMA reforms. As at the date of writing, there has been no indication from the Government as to whether all or some of these recommendations will be adopted nor any indication as to timing for the next steps in the reform process.

Resource Management Amendment Bill

On 26 July 2012 the Resource Management (Restricted Duration of Certain Discharge and Coastal Permits) Amendment Bill was introduced. The purpose of the Bill is to restrict the duration of discharge consents granted under the exceptional circumstances provision in section 107(2)(a) to a maximum of five years in order

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to reduce long-term pollution of waterways. At present section 107 allows the grant of discharge permits for up to 35 years. The Bill is currently awaiting its first reading. As a private members Bill (rather than a Government Bill) the Bill will need political/Government support in order to proceed further.

We will continue to follow the RMA reforms and provide commentary on any developments in future articles.

Report on Hydroelectricity V Wild and Scenic Rivers

In May 2012 the Parliamentary Commissioner for the Environment released a report entitled "Hydroelectricity or Wild Rivers – Climate Change versus Natural Heritage"⁶. This report considered the conflicts arising between the environmental benefits arising from hydroelectricity schemes and the inherent values of wild rivers. The report made five recommendations which:

- Called for a better balance to be struck between the competing environmental values of renewable energy and wild and scenic rivers and suggested there was a need to amend the National Policy Statements relating to Renewable Energy and Freshwater Management to achieve this balance.
- Indicated there was a need to improve protection of wild and scenic rivers and suggested that this could be assisted by streamlining water conservation order processes and investigating which rivers would be appropriate for such protection.
- Suggested reclassifying stewardship land where wild and scenic rivers flow through that land and where those rivers require protection.
- Proposed transferring the administration of riverbeds within the conservation estate land from Land Information New Zealand to the Department of Conservation.
- Emphasized the need to streamline and co-ordinate the resource consent and conservation concession processes.
- As at the date of writing there had been no formal response from the government, so it remains to be seen whether any or all of these recommendations will be investigated or implemented. We will keep however you posted.

Waitangi Tribunal Decision Regarding Proposed Sale of State Owned Energy Companies

There has been a significant amount of coverage in the media lately of the Treaty claim to water resources and the impact that iwi and hapu interests in these resources may have on the proposed sale process of the state owned energy companies. The crux of the issue is whether the Government's proposed sale process will adversely impact upon the water claim and if so whether the sale process should be made to await the outcome of the Treaty process.

To bring this matter to a head, the Maori Council lodged an application for an urgent Waitangi Tribunal hearing seeking that the Tribunal:

"...make an interim recommendation that the Crown not commence the share float of any of the four Mixed Ownership Model companies named in their claim until it has received the Tribunal's report and recommendations for stage one of this inquiry."

While the Government's initial reaction was that the sale process should not be held up by the Treaty claim (primarily on the basis that Tribunal findings were not, as a matter of law, binding on the Government), the Government has subsequently softened its stance on this issue.

On 30 July 2012 the Tribunal after considering a number of factors, including: the national importance of the freshwater and geothermal resources claim; the previous recognition given to water claims; the impact of the proposed sales on the claim; the impact of the delay on the Crown; and its own timing in terms of an interim decision on the claim; issued a direction which stated (at paragraph 61):

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“While the Government’s initial reaction was that the sale process should not be held up by the Treaty claim (primarily on the basis that Tribunal findings were not, as a matter of law, binding on the Government), the Government has subsequently softened its stance on this issue.”

“We therefore conclude that the Crown ought not to commence the sale of shares in any of the Mixed Ownership Model companies until we have had the opportunity to complete our report on stage one of this inquiry and the Crown has had the opportunity to give this report, and any recommendations it contains, in-depth and considered examination.”

In this direction the Tribunal indicated that its stage one report would be completed in September 2012. However, following a formal request from the Government for the report to be completed by 24 August 2012 (to enable a decision on the sale process to be made this year), the Tribunal has agreed to produce an interim report by 24 August 2012 and a final report in September 2012. We will continue to follow this process and provide an update on the outcome of the reports and the Government’s response in future articles.

Recent Environment Court Case

Of interest, and raising similar issues to the proposed state owned energy sale process but in a resource management context, is the

recent case of *Norris v Northland Regional Council*⁷.

In this case appeals had been lodged against two decisions of the Northland Regional Council to grant consents for water takes from the Waipao Stream. One of the Appellants, the Whaititiri Maori Reserve Trustees, applied to have the hearing of the appeals adjourned pending the outcome of their claim to the Waitangi Tribunal in respect of water and geothermal resources. The Court held that:

- It is well settled law that the legal regimes applying to Treaty claims and resource consents are separate
- While there are aspects of a claim, such as the relationship of an iwi or hapu with a particular resource which may be relevant to consider under both regimes, the presence of a Treaty claim does not “embargo land from the RMA process”
- The existence of a treaty claim to water cannot be used to justify delaying the processing of resource consent applications to take water

The Court therefore refused the application for adjournment and allowed the appeals to continue. ■

Footnotes

¹Local Government Act 2002 Amendment Bill (27-1).
²Technical Advisory Group, Report of the Minister for the Environment’s Resource Management Act 1991 Principles Technical Advisory Group, (February 2012).
³Sections 5 and 8 were expressly excluded from the review.
⁴Refer TAG Principles Report, page 8.
⁵Refer TAG Principles Report, pages 9–13.
⁶Parliamentary Commissioner for the Environment, “Hydroelectricity or Wild Rivers? Climate Change versus Natural Heritage”, (May 2012) (Wellington, PCE: www.pce.parliament.nz <<http://www.pce.parliament.nz>>).
⁷[2012] NZEnvC 124.

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A Smart Approach to Water Management

Sally Blundell – University of Canterbury

Aquifer levels are falling, saltwater is encroaching on underground water systems, nitrate and phosphorus runoff is on the rise and sediment build-up and land development are increasing the risk of flooding.

All in all, says University of Canterbury senior lecturer in management science Dr John Raffensperger, our systems for coping with water risk are "a bit of a mess".

"Living sustainably means living under constraints. We have to learn to live with the available water and, to do that, we need to manage it better."

Raffensperger and other members of the University of Canterbury's Water Markets Research Group (WMRG) have devised a way to do just that, using ecological science, mathematical modelling and smart market trading to find the highest value commercial use for available water while also protecting the environment.

"Living sustainably means living under constraints. We have to learn to live with the available water and, to do that, we need to manage it better."

"The idea is to think collaboratively, to be more aware of what is happening over the fence. The current system is litigious but if you have a smart market people are incentivised to get along – they have to be fair."

A smart market is an auction in which a resource is traded by a pool of users within a set of physical constraints. In trading groundwater, for example, an auction manager would use a hydrological optimisation computer model to allocate water on the basis of users' bids, sustainable river flows and real time monitoring, so allowing permit owners with unused water capacity to find a buyer, and those needing more water capacity to find a seller.



It is, says WMRG member Associate Professor Mark Milke (Civil and Natural Resources Engineering), "a completely new way of managing the environment".

"Councils have a fairly sophisticated understanding of their water source to manage current allocation but even that is pretty much 'first come first served'. If you want some water you go to the council and say this is how much I want and this is what I want it for and they check to see if it will put them over some limit and if it's not then they say that's fine."

As people rush to stake their claim the country's resources are being pushed to their limit.

"One mindset is if water falls on my land it's mine," says WMRG researcher Professor Grant Read (Management).

"If it flows past my back yard it's mine. If I can suck it out of the ground – irrespective of where it comes from – it's mine. So whoever sucks hardest gets the most. That is a race to the bottom.

"If you go to some parts of the world you find whole villages dead because people put down deeper wells to suck the water out, leaving traditional wells dry so people have had to abandon the place. Then you come to a beautifully irrigated field owned by some farmer wealthy enough to afford a modern pump."

In putting a price on a unit of water at a particular place and at a particular time the incentive to hoard water is gone and agriculture has to contend with the real worth of this most undervalued of resources. In times of drought, for example, the price of water would go up, so incentivising conservation (no longer, says Raffensperger, would we see irrigators operating during blistering nor'westers).



The University of Canterbury Water Markets Research Group (left to right) – Associate Professor Mark Milke, senior lecturer Dr Tom Cochrane, senior lecturer Dr John F. Raffensperger, senior lecturer Dr Shane Dye, Adjunct Professor Grant Read, PhD student Antonio Pinto and PhD student Stephen Starkey (Not photographed is PhD student Indra Mahakalanda)

“If you go to some parts of the world you find whole villages dead because people put down deeper wells to suck the water out, leaving traditional wells dry so people have had to abandon the place.”

Periods of low demand, on the other hand, would encourage diversification into non-traditional farming practices.

Across the world smart markets are being used for natural gas, radio spectrums, university enrolments and, most commonly, electricity.

“You can’t actually define how a particular unit of electricity flows from producer to consumer,” says Read.

“It is more as a set of equations in which flows are driven by changes in [electrical] pressure. Underground water is much the same.

“If I pull out one more unit of water here it doesn’t take one unit off someone somewhere else – it will take part of a unit over here and part of a unit over there – it will have quite diverse effects.”

Unlike electricity, however, there is a delayed effect with groundwater use – you can suck water out of the ground for quite a long time before seeing the impact somewhere else. By then, too, the quality of the water may have dropped as lower pressure results in more saltwater intrusion.

Concerns that smart water markets will be dominated by big users are, says Raffensperger, unfounded.

“They still need land to irrigate and the water is so dispersed in the ground it is difficult to stand in one place and get all the water. Big operations will have a bigger benefit but proportionately the smaller user will benefit just as well.”

The benefits are considerable. Under a smart market the consent process is faster, application costs (usually around \$5,000) are lower and farmers can sell unwanted water.

And all it requires, says Raffensperger, is a secure website, an accounting system and a “modest office”.

The system can also be adapted for other forms of water use. Management science student Stephen Starkey is examining smart markets for urban water networks, using an optimisation model to manage trade between reservoir operators, desalination plant operators and retail water suppliers.

Fellow student Antonio Pinto, co-supervised by senior lecturer Tom Cochrane in the Department of Civil and Natural Resource Engineering, is studying smart markets for sediment and runoff, so improving water quality, reducing flooding and incentivising the planting of more green spaces. Management science PhD student Indra Mahakalanda is studying the relationship between electricity and water (electricity generation uses a lot of water and water pumping uses a lot of electricity).

As senior lecturer in management science Dr Shane Dye explains, all these smart market models facilitate things people want to do.

“It just makes it easier, and instead of spending money on litigation you are helping each other.” ■

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Adapting Water Efficiency Messages for an Irrational Audience

Jonathan Reed and Sally Dymond – CH2M Beca

Around the world, professionals in the water industry are exploring different methods to influence and improve individual water use behaviour. Recent developments in social marketing techniques provide evidence of new ways to influence customer behaviour. Often managing demand is discussed in terms of implementing water efficient devices – such as low flush toilets, low flow showers and other similar equipment. Though these have an important part to play in reducing water use, people's behaviour and how they use water is possibly more important. To achieve sustained changes in customer water use behaviour, water conservation messages should adapt to reflect their social context.

Behavioural Change Models

The concept of behavioural change has been applied across economics, psychology, and marketing. These behavioural change techniques are a set of actions by individuals which can be repeated and provide long term benefits. It should be possible for these techniques to be applied to the water industry to influence people's approach to water use. But can we, as design professionals, use marketing and psychology to influence behaviour and achieve change?

Economists and psychologists have developed different models to explain behaviour and therefore investigate how it can be changed. This can be applied in all sorts of ways; for some sort of social good or for commercial reasons, such as to promote a product or service.

Early economic models explained decisions in markets on the basis that human beings are rational and seek to maximise utility. This suggests that people will make decisions to maximise rational utility, or with the 'best outcome' in mind. In sociology the theory of rational choice has dominated thinking for centuries; where rational behaviour is defined by a necessary, natural or logical association between the ends and the means for its attainment. The emphasis on rationality may be a good theoretical basis for higher level analysis, but it may not replicate faithfully the decision making processes that people follow.

The approaches that were included in classical models of behaviour exclude many external factors, such as perception, habits

and the social context. In our work we often believe that people will behave rationally in their approach to water use. Perhaps we need to tailor messages so they are appropriate for their social context to better influence behaviour. This was highlighted by Mark Earls in his 2007 book *'Influencing Mass Behaviour'* where he suggests that "Only by getting individuals and groups to choose to do something for their own reasons – often largely social – will change in behaviour come about". Effective delivery of a message therefore needs to include the personal value of receiving advice from people we trust; family, friends and colleagues.

Behavioural Change Initiatives In Other Industries

Approaches to behavioural change have been promoted across a number of industries. In particular, the marketing industry has moved towards community based marketing, where purchasing decisions are made based on a personal recommendation. Evidence from the UK suggests that 76% of purchasing decisions are as a result of a personal recommendation, and only 15% due to marketing. Other industries have also developed approaches to behavioural change and the most significant of these is the health sector.

"The concept of behavioural change has been applied across economics, psychology, and marketing. These behavioural change techniques are a set of actions by individuals which can be repeated and provide long term benefits. It should be possible for these techniques to be applied to the water industry to influence people's approach to water use. But can we, as design professionals, use marketing and psychology to influence behaviour and achieve change?"

Within the health sector it has long been recognised that it is more cost effective to change behaviour – smoking, for example – than treat the resulting disease. However, poor behaviour results from the interaction of social, biological, psychological and environmental factors.

One of the key pieces of work carried out in relation to smoking behaviour was by Prochaska and DiClemente (1983). This promotes a "stages of behavioural change" model, where individuals move from awareness to action. The individual would be encouraged to move from pre contemplation, contemplation, preparation, action and onto maintenance as shown in Figure 1.

One of the key stages in this model is the maintenance stage. Without maintaining the positive support in relation to smoking, individuals may lapse and return to their smoking habit. This has a strong correlation with infrastructure. Where positive actions develop to use more sustainable transport, reduce waste, water or electricity, this must be reinforced regularly to maintain the positive outcome.

A recent example of a successful behavioural change campaign in the UK was Jamie Oliver's Food Revolution and School Dinners



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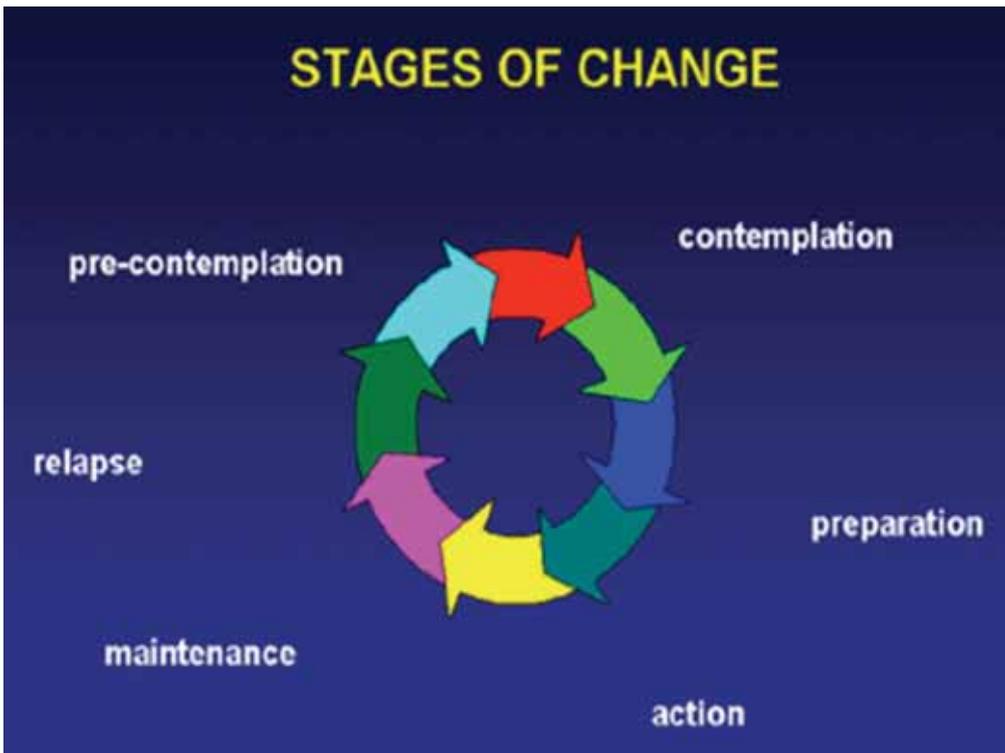


Figure 1 – stages of change model

of the UK government's approaches, was the trust the public have in Oliver and their sense of "knowing" him. The challenge in using celebrity endorsement of behavioural change campaigns is whether the public trust in the person can be transferred to the message being delivered. In Oliver's case, his role in the programme as the "the provocateur and renegade" played on Oliver's public persona as the likeable rogue, essentially delivering a message that was louder and lasted longer than when previous faceless public health sector campaigns had tried to deliver the same message. In one episode of Jamie's Food Revolution program, he tests children in a kindergarten to see if they knew where their food came from. The children could not even identify a tomato! This highlighted a real issue in the public health industry – a lack of knowledge and awareness

programme (Figure 2), which targeted children and families to change the way they ate and the food they purchased. Part of the success of the campaign, and a key differentiator from many

of what we consume – which Oliver proved could be easily resolved by teaching kids of all ages and skills a set of simple cooking skills they could use for the rest of their life.

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Figure 2 – Jamie Oliver in his TV programme “Jamie Oliver’s Food Revolution”(Source: The Indy-pendent)

Creative Messages About Water Use

A lack of awareness and knowledge by individuals, households and businesses of their use of services and consumables are common issues faced across all sectors when it comes to motivating behavioural change. Increasingly for the water sector, the interaction that urban populations have with the water they use is limited to turning on the tap, watching the water flush away...and then paying the bill. The challenge today is to encourage water use awareness and promote efficient use of water in the houses and infrastructure we currently have, in order to help secure a better future for our water tomorrow. However, many urban citizens are unaware of what the water cycle involves and how we all play a central part in the journey of water from the sky to the sea and back again. To rely on policies

“The challenge today is to encourage water use awareness and promote efficient use of water in the houses and infrastructure we currently have, in order to help secure a better future for our water tomorrow. However, many urban citizens are unaware of what the water cycle involves and how we all play a central part in the journey of water from the sky to the sea and back again.”

and technological improvements to create solutions to current and future water issues will not address the key issues of awareness and knowledge that drive our everyday use of water, coupled with customers' irrational behaviour. We should develop new ways of delivering messages to reach water users within their social context. These would be more likely to result in sustained changes to water use, motivating long term efficient behaviours.

As part of her Masters in Planning Practice at the University of Auckland, Sally Dymond drew on her studies of water demand management to develop an interactive education and awareness tool for urban populations. Her aim was to create a prototype tool








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Figure 3 – Example of a “scene” from Sally Dymond’s water communication tool

that delivered the message of water conservation contextually, in an engaging manner that was fun and interesting to a wide variety of audiences. The creative tool provides a medium where people can explore their relationship with the ‘three waters’– freshwater, wastewater and stormwater. The purpose of the tool was to facilitate interaction between people and the ‘water environment’, and to place people within the water cycle, using Auckland’s water system as an example (Figure 3).

“As a creative communication solution, Dymond used videos and an interactive map of Auckland to take the water user on a journey through Auckland’s water cycle. The user explores where their water comes from, and how their use of water is directly and indirectly connected to different effects on the environment, and what consequences this can have for the user.”

As a creative communication solution, Dymond used videos and an interactive map of Auckland to take the water user on a journey through Auckland’s water cycle. The user explores where their water comes from, and how their use of water is directly and indirectly connected to different effects on the environment, and what consequences this can have for the user. The ‘journey’ concludes by walking the user through simple water conservation techniques, explaining to the user how their individual actions could make a difference in the future. The tool was designed to be fun and engaging, highlighting the simple things people could do to reduce daily water consumption. Rather than telling water users what to do, the aim of the tool was to influence people’s interaction with their water and motivate them to make a difference.

Dymond’s project and the other initiatives listed above are all examples of how creative thinking and different media can be used to deliver a message. They set the message in the social context with the aim of making long term behavioural changes. As discussed above, there is no one magic solution to overcoming the personal habits and lifestyles of water users that influence their everyday use of water. However, by researching not just the target audience but the world in which they live, and the sources of information they are most likely to trust, we can tailor our messages to be more targeted and effective. The essential component to creating a successful water conservation campaigns will therefore not be in the message itself, but in understanding the social context in which it is being delivered, and adapting the delivery of the message accordingly. ■

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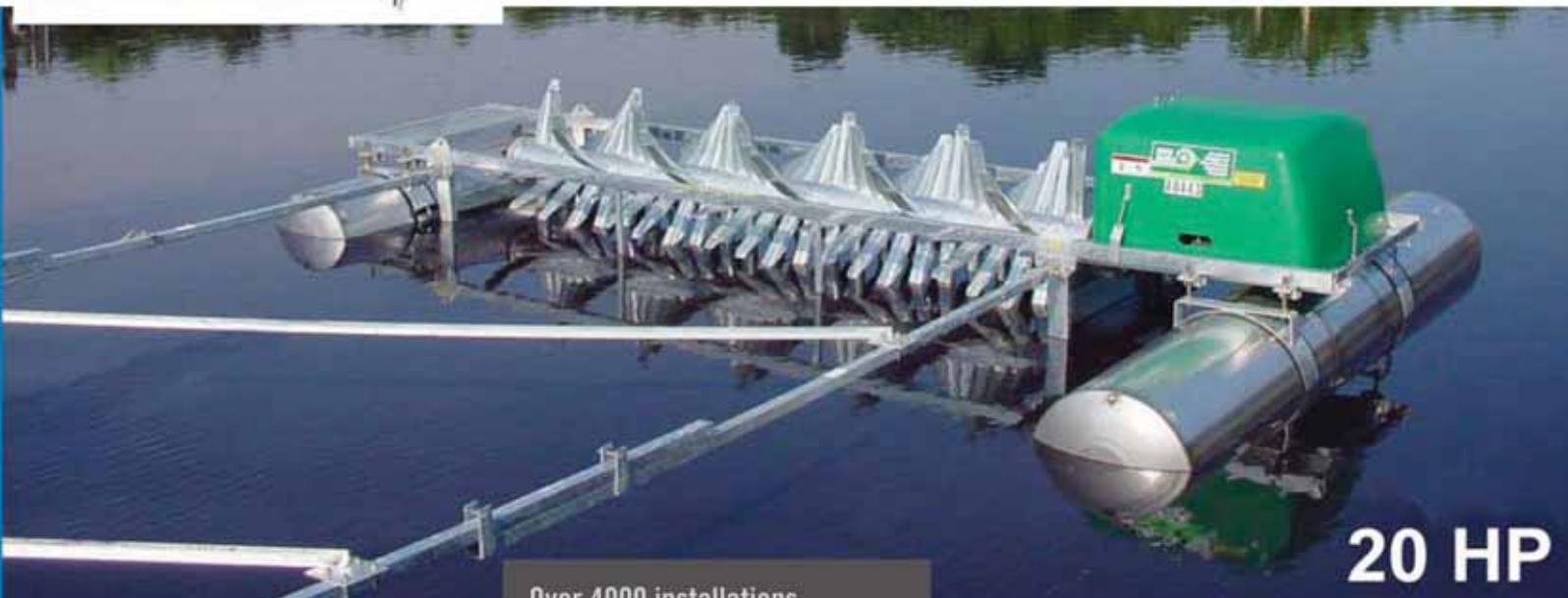
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Benchmarking

**Dr David Edmonds –
Technical Coordinator,
Water New Zealand**



Dr David Edmonds

The infrastructure sector is currently under a spotlight regarding its performance. In their 2011 National Infrastructure Plan the Infrastructure Unit of Treasury looked at the relative performance of New Zealand's five main infrastructure sectors (transport, telecommunications, energy, water and social) and found the water sector wanting, with poor relative scores under three of the six guiding principles used in the assessment. With regard to the urban water infrastructure the two key issues highlighted in the report were:

"Funding Mechanisms – Local authorities are confronted with competing interests on multiple

fronts. The lack of alignment between the increasing requirements to meet national objectives and local funding and accountability is a concern"

"Accountability and Performance – There is currently insufficient good information available at local or national level to develop a consistent and credible understanding of the current state of urban water assets"

The report goes on to say that improvement, with 'greater emphasis on clarity, consistency and quality of financial reporting', is expected and amongst other things the report promotes the establishment of 'a flexible but common platform for reporting against the three waters infrastructure'.

Notwithstanding the emphasis that Treasury (not unexpectedly) puts on financial reporting, better understanding of how others are faring with regard to non-financial measures, as well as financially, is one of the first steps towards better performance. This is where industry benchmarking, namely the assembly of consistent data obtained from audited reporting and made publically available, can help. By comparing one's own performance against measures related to entities with similar characteristics, an insight can be had into one's own relative performance.

The primary objectives of benchmarking are:

- 1) To provide a set of key performance indicators related to a utility's managerial, financial and operational activities to measure performance and provide managerial guidance
- 2) To enable the utility to compare its performance with those of other similar utilities to identify areas needing improvement

By providing comparative information on utilities' costs and performance, benchmarking can also be of value to other stakeholders, including:

- Governments: to monitor and adjust sector policies and programmes
- Regulators: to ensure adequate incentives are provided for improved utility performance, increased value for consumers and suitable protection for the environment
- Consumers: to enable valid concerns to be expressed (by providing for greater transparency)

Better understanding is the first step towards better performance. The International Benchmark Network (IBNET) for Water Supply and Sanitation Performance (the 'blue book' published by the World Bank) notes that..."comparison with similar utilities

"This is where industry benchmarking, namely the assembly of consistent data obtained from audited reporting and made publically available, can help. By comparing one's own performance against measures related to entities with similar characteristics, an insight can be had into one's own relative performance."

elsewhere in a country or region or with standards of international good practice can shed light on how well a utility is performing, identify areas for improvement, and help indicate a plan of action". This applies equally to developed as well as developing countries.

Benchmarking also promotes transparency, something the local government reforms are likely to strongly promote, and which is a statutory requirement in this country for publicly listed companies. In drawing comparisons it is essential that consistent data is used. In the financial area, the various treatments applied to depreciation cost, allocation of overhead costs (particularly where a water utility's financials are included as part of a council's overall operations, as opposed to a stand-alone operation) interest costs and assets acquired as part of a development contribution can lead to lack of transparency, and will doubtless be addressed as part of the local government reforms. Important conclusions that need to be drawn from the financial data include whether or not revenue covers cost of operation and whether or not capital expenditure (over a number of years) is at least keeping pace with asset depreciation.

Lack of transparency due to inconsistent data is of equal concern for non-financial measures. For example, in the case of the in-flow capacity to a waste water treatment plant, there are a number of ways this could be characterised:

- Peak wet weather flow (PWWF)
- Peak dry weather flow (PDWF)
- Average dry weather flow (ADWF)



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- Daily flow averaged over a specified period, e.g. ADF over a year

Each measure has its relevance in the design and management of a waste water plant, but which should be used in an overview benchmarking exercise? In this case, probably the ADWF is most relevant as it ties in the BOD load on the plant with the population served. However the most important issue is that a consistent measure is used by all those contributing to the benchmarking exercise. If a vague question is posed in a survey, the responses will be equally vague.

Australia has undertaken an annual water utilities benchmarking survey since 2004/05 through the National Performance Report: Urban Water Utilities managed by the National Water Commission in collaboration with the Water Services Association of Australia (WSAA). While closely modelled on the Australian survey, the New Zealand equivalent, the National Performance Review of Water Utilities, managed by *Water New Zealand*, includes stormwater as well as water supply and wastewater.

The New Zealand survey has been undertaken annually since first covering the 2007/08 year and *Water New Zealand*

is gearing up for the 2011/12 survey. It is anticipated that at least 14 utility network operators will be involved in the 2011/12 survey, though it is hoped that others can be encouraged to join in as, in any benchmarking exercise, with more contributors, the better the data represents the population from which it is drawn. While benchmarking one's own performance against others indicates good governance, involvement in the benchmarking survey indicates commitment.

There can be a reluctance to be involved with benchmarking in that it can show your own organisation up in a poor light, or that regulatory authorities may decide to take action against you if, for example, non-compliance with some aspect of a resource consent is discernible from the data provided. The Australians have demonstrated a maturity that enables them to overcome such concerns and regularly report on, for example, the number of wastewater treatment plants that meet sewage treatment compliance within specified bands – less than 80% compliant, 80 to 89% compliant, 90 to 99% compliant as well as fully compliant.

Benchmarking often focuses on numerical data. In looking at the relative

“Each measure has its relevance in the design and management of a waste water plant, but which should be used in an overview benchmarking exercise?”

'health' of New Zealand's infrastructure the National Infrastructure Plan used a more subjective approach making an assessment of performance on the basis of one of three traffic light scores (red, amber or green) under each of six headings or 'guiding principles'. In the Pilot Study¹ undertaken by PwC and GHD on behalf of *Water New Zealand* and the New Zealand Council for Infrastructure Development, supported by a number of study partners, the layers of detail behind performance under each of the six headings was investigated for each of nine participant utility operators. Both the depth of the study and the results provided significant insight into what constitutes good governance in the water utilities area.



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“Investment analysis involves whole of life assessment.”

The questions posed to participants in the Pilot Study can be recast as a series of good governance principles under each of the six guiding principles put forward in the National Infrastructure Plan:

Investment Analysis

The asset management plan relating to the three waters is reviewed regularly, at least annually, and provides robust information about the asset condition, performance and levels of service provided.

Investment analysis involves whole of life assessment.

The basis for replacement of existing assets involves detailed condition assessment.

New assets meet nationally accepted design and construction standards.

The investment analysis procedures used follow widely accepted guidelines and the costs and benefits:

- Include social and environmental issues, including the impact on the local economy, as well as financial measures

- Assess the potential for integration with networks from other infrastructure sectors
- Take into account likely future legislative changes
- Look at a scenario of changes in demand for services (both increased and reduced level of service) including the value of restricting demand for different customers
- Use external benchmarking to review the performance of existing and proposed new or replacement plant
- Look at alternative ownership models (e.g. JVs with other councils) for major investments

Resilience

An assessment of the vulnerability of the components of the infrastructure to significant natural or other risks is regularly undertaken.

There are contingency plans in place covering power outage and the occurrence of likely major hazardous events, and the plans are well understood by those who may need to use them.

Maintenance procedures take due account of the criticality of the various elements of the network.

Duplication of critical elements of the network and/or power back-up are considered when looking at capital investment.

Funding Mechanisms

The management of the infrastructure is self funding, ie revenue covers total operating costs, including depreciation of assets and interest on loans.

Volumetric metering* is used as a basis for charging for water to reduce high usage and wastage.

Actual capital expenditure closely follows planned capital expenditure.

Alternative revenue tools, e.g. metering where it currently does not exist, or changes to development contributions policy, are regularly reviewed.

**Noting, as per the National Infrastructure Plan, that volumetric charging does not imply or require private ownership of water assets*

Accountability and Performance

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“The ‘water unit’ provides input into the territorial authority’s land use plan.”

Performance measures are regularly recorded and external benchmarking undertaken to focus improvement through ‘competition by comparison’.

The public/customers are involved in decision making through a consultation process.

Condition assessment of assets is carried out on an appropriate regular basis, with the frequency based upon a hierarchy in terms of the criticality of particular components.

From time to time the current operational model is reviewed and possible alternatives considered with respect to:

- Delivery of services (e.g. outsourcing of operational and maintenance work)
- Ownership of the assets (e.g. JV involving two or more local authorities)
- Independence of the ‘water unit’ (e.g. council controlled organisation)

Regulation

The organisation managing the water assets has a good understanding of the role that the main parties that regulate* activities have in ensuring the on-going

sustainability and robustness of the services provided.

Regulatory standards and consent conditions are met.

The organisation is able to predict the behaviour of regulators.

The organisation understands the impact of enforcement if regulatory standards are not met or consent conditions breached.

**It is noted in the National Infrastructure Plan that the government is seeking to reduce compliance and transaction costs that are derived from central government policy, with the aim of improving and coordinating the interaction with local government*

Coordination

Effective interaction occurs with other infrastructure providers, both within and outside the local authority (e.g. so that water main renewals do not take place just after road maintenance has been completed on the same stretch of road).

There is a useful interaction with land use planners throughout the planning process.

The ‘water unit’ provides input into the territorial authority’s land use plan.

Water infrastructure asset management plans recognise the district plan and any regional water plan.

Collaboration and sharing of best practice occurs with geographically close councils on:

- Water plans (where applicable)
- Capital investment
- Operational/maintenance activities

The thought had been that response to survey questions in each of the above areas would be sought from participants as part of the 2011/12 National Performance Review on the basis that if the management is right, good performance will follow. However consideration of the difficulties involved in impartially evaluating and scoring the responses (even on a score sheet as simple as the traffic light model discussed above) not to mention how the responses would be audited, led to the conclusion that this was a bridge too far, at least for the upcoming survey. ■

Footnote

¹Implementing the National Infrastructure Plan in the Water Industry – a Pilot Study, July 2012



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The 2011 National Infrastructure Plan – Did Treasury Get it Right for the Urban Water Sector?

**Steve Carne – Business Leader, Water, NZ, GHD Limited,
David Walker – Director, Consulting, PwC, Mark Robinson –
Manager, Consulting, PwC**

Abstract

As a result of a relatively poor outcome for the water sector (Figure 1) compared to other chosen infrastructure sectors in the high level “traffic light” assessment of infrastructure sectors by Treasury’s National Infrastructure Unit (NIU) in their 2011 National Infrastructure Plan (NIP), GHD and PwC were engaged to undertake a pilot study

Figure 1 – 2011 NIP Outcomes

	Transport	Telecommunications	Energy	Water	Social
Investment analysis	Green	Green	Green	Red	Green
Resilience	Green	Green	Green	Red	Green
Funding Mechanisms	Green	Green	Green	Red	Green
Accountability and Performance	Green	Green	Green	Red	Green
Regulation	Green	Green	Green	Red	Green
Coordination	Green	Green	Green	Red	Green

reviewing the performance and potential improvement opportunities in local authority urban water and wastewater operations.

It is important to note at the outset that whilst the NIU’s categorisation of the “Water” infrastructure sector was all-inclusive of both the urban and productive or rural water sectors, the scope of this pilot study was limited to the provision of urban water supply and wastewater and excludes the urban stormwater and the rural or productive water sectors.

The pilot study was carried out by assessing performance and outcomes of ten participant organisations, a mixture of councils and water focussed council-controlled organisations (CCOs), against the six performance principles contained in the NIP framework. The chosen grouping of ten pilot study participants serves approximately half the nation’s population and is geographically diverse with a cluster of participants in the Waikato Basin. It also includes a range of water and wastewater service providers including smaller district councils, larger district or city councils based on provincial towns and cities and also Wellington City, Hutt City and Watercare.

To achieve its intended outcomes, the study required:

- The development of an assessment methodology based on the NIP principles framework
- An assessment of local authority water and waste operational performance against this framework centred on a pilot grouping of councils and utility providers

Both of these study phases were undertaken in a very consultative manner with study participants and other industry stakeholders. This enabled significant industry participation in the development of the framework questions used as the basis for the assessment and the supply of data for the assessments.

Some of the study elements were subject to data limitations, given that the council water and wastewater operations are integrated

within existing council organisations. In particular, this restricted the ability to assess performance against the ‘funding mechanisms’ principle.

The inclusion of two CCOs, Watercare Services Limited and Capacity – Wellington Water Management Limited, provided a useful contrast to the traditional council operations.

1. Pilot Study Scope

The study scope allowed us to assess data and information available from the sector at the operator level to initially develop a detailed assessment methodology for the NIP principles.

The detailed methodology was developed and workshopped over a three-month period in two rounds of one-on-one face-to-face consultation meetings with each of the participating organisations.

At these meetings, a total of 46 initial metrics were developed in conjunction with the study participants which were targeted at addressing performance of their organisation against each of the NIU’s six guiding principles which are detailed in Table 1. As the methodology was defined during the assessment, some of these metrics were discarded as information was either unavailable or had been repeated elsewhere in the assessment.

Inherent in the study outcomes is that good practice is defined as good practice in relation to the NIP principles. Good practice in relation to the guiding principles is defined in the NIP by the NIU as shown in Table 1.

The principles focus on processes and decision-making, rather than outcomes. The NIP assessment was therefore based on the quality of processes and decision-making. The NIP implicitly assumed that good processes and decision-making lead to good outcomes.

“Some of the study elements were subject to data limitations, given that the council water and wastewater operations are integrated within existing council organisations. In particular, this restricted the ability to assess performance against the ‘funding mechanisms’ principle.”

The NIP assessed each infrastructure sector against each principle using high-level assessment criteria and a ‘traffic-light’ scoring scale. A sector received a green score on a principle if it “occurs effectively”, an amber score if “occurs but could be further developed”, and a red score if it “does not occur or is ineffective”. This scoring scale is essentially the same as the RAG (red, amber, green) method commonly used in benchmarking, including by SOLGM. Our assessment methodology used the same ‘traffic-light’ scoring scale.

Guiding Principle	NIP Good Practice Description
Investment analysis	Investment is well analysed and takes sufficient account of potential changes in demand.
Resilience	National infrastructure networks are able to deal with significant disruption and changing circumstances.
Funding Mechanisms	Maintain a consistent and long term commitment to infrastructure funding and utilise a broad range of funding tools.
Accountability and Performance	It is clear who is making decisions, and on what basis, and what outcomes are being sought.
Regulation	Regulation enables investment in infrastructure that is consistent with other principles, and reduces lead times and certainty.
Coordination	Infrastructure decisions are well coordinated across different providers and are sufficiently integrated with decisions about land use.

Table 1 – The NIP Guiding Principles

2. Findings

Figure 2 presents the results for each pilot study participant against the NIP guiding principles.

Compared to the NIU scores, the pilot study results are as follows:

1. The individual scores reflected a better overall result than the preceding industry level assessment completed by the NIU in 2011.
2. This improvement was evident across all participants for the investment analysis and coordination principles.
3. The average score across participants for the resilience and regulation were better than the outcome of the NIP assessment.

4. The outcomes across all participants for the funding mechanisms principle were consistent with the NIP assessment, while the outcomes for the accountability and performance principle were variable across participants but broadly consistent with NIP outcome on average.

The improvements stated above are considered to be “good news stories” for the participants and if consistent nationally, the urban water and wastewater infrastructure sector itself. We note however that many of the individual scores from the pilot study are still inferior to the corresponding scores for other infrastructure sectors in the NIP.

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Figure 2 – Pilot Study Outcomes

Principles	2011 NIP	Waikato	Hamilton	Waipa	Taupo	Watercare	New Plymouth	Hutt	Wellington	Dunedin
Investment Analysis	Red	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow
Resilience	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow
Funding Mechanisms	Red	Red	Red	Red	Red	Yellow	Red	Red	Red	Red
Accountability and Performance	Yellow	Red	Yellow	Yellow	Red	Green	Yellow	Green	Green	Green
Regulation	Red	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Coordination	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green

2.1 Limitations Of The Niu Principles For The Urban Water Sector

Upon review, responses to the assessment questions suggested that some aspects of the NIU principles are less applicable to the urban water and wastewater infrastructure sector than they might be for other infrastructure sectors which are the subject of the 2011 NIP assessment.

Scale of project size was an issue in considering broader funding mechanisms. Due mainly to scale and the obvious requirement for compliance with legislative and regulatory requirements, there was very limited consideration by participants of other infrastructure funding opportunities. We note that it is unclear whether the lack of sufficiently sized projects is because this scale is optimal for water capital projects, or is a result of lack of consideration of larger projects due to current water provision structural arrangements.

Volumetric charging for water and wastewater, whilst being an alternative funding source, a tool for improving equity across water users, and affording pricing signals for encouraging efficient water use, may not be appropriate in all jurisdictions. In particular, some councils may incur a relatively low cost to supply water to consumers where clean and apparently plentiful groundwater sources currently exist, and in these areas the benefits of volumetric charging may not outweigh the costs associated with metering. However, good financial practice still requires the periodic consideration of the costs and benefits of alternative options such as this.

These two points illustrate the differences between the existing urban water and wastewater sector from the telecommunications and energy sectors where optimal delivery structures are different. These inherent industry differences need to be considered in any future comparative assessments between sectors NIU decides to undertake in the future.

2.2 Trends for Good Performance

There was considerable variation in the results with each participant receiving a combination of effective and “further development required” outcomes.

However, it was evident that there were a number of trends arising, with some participants having better results.

Several different governance models are used, ranging from council department, business unit, shared service, CCO asset manager/operator and fully dedicated water utility.

Strategic focus on the needs and provision of the water and wastewater services was found to be an important improvement factor. This enabled specialised operators embedded in council organisations to score improved results.

The study found that single-purpose entities have a greater degree of strategic focus.

“The study found that single-purpose entities have a greater degree of strategic focus.”

There is also a clear correlation between an operator's scale and its results. Larger operators scored better than smaller operators. Increased size enables improved strategic focus, specialisation of technical staff, purchasing power and economies of scale.

However, operators involved in shared services arrangements with others were able to achieve some portion of the improved outcomes that could be achieved through larger scale.

Governance models that enabled inter-council sharing or integration provided leverage for both scale and strategic focus. These models also provided greater opportunities for funding network infrastructure in smaller townships, which are subject to affordability challenges.

Regulation is problematic for the industry. Water providers are ‘takers’ rather than imposers of the regulation which is applied from a range of government agencies and regional councils, often with conflicting priorities. Scores for this principle across the all the respondents were accordingly unfavourable, but were more of a reflection of the national regulatory framework than their individual performance. The study suggests that larger organisations were better able to respond to regulatory directives, but that regulatory problems were present for operators of all scales and governance models.

Whilst the study attempted to address the question related to the perception that the sector is under-funded, it could not arrive at such a conclusion because of the absence of data to fully assess this issue. This absence may be due to the funding process considerations in the Long Term Plan development process itself rather than an actual funding shortfall.

Improvement Opportunities

The additional level of granularity provided by the pilot study, compared to the 2011 NIU assessment enabled the identification of detailed improvement opportunities at both service provider and industry level. Highlights by category include:

1. Investment analysis – Utilisation of enhanced investment analysis will provide a better understanding of the wider economic benefits of proposed expenditures in addition to more robust cost benefit assessment. Operator scale influences the ability and extent to which analysis can be successfully implemented.

“Whilst the study attempted to address the question related to the perception that the sector is under-funded, it could not arrive at such a conclusion because of the absence of data to fully assess this issue.

2. Resilience – Hazards and risks are generally well understood, but there is some work to do in the area of mitigations for these risks.
3. Funding mechanisms – Subject to some limited exceptions, there is a high dependency on rates which provides weak signals to the economic use of water and wastewater assets. Scale of project size was an issue in considering broader funding mechanisms and alternative ownership models.
4. Accountability and performance – Generally respondents had performance indicator frameworks in place with a number being involved in external benchmarking opportunities. It was not evident however, that in all cases these were being used as a driver to continually review assets as a means of improving investment and service delivery outcomes.
5. Regulation – Although respondents have limited opportunity to influence the regulatory framework for the betterment of their operations and service delivery, shared or integrated arrangements can mitigate some of the variability and apparent lack of affordability of compliance costs that were evident for smaller service providers.

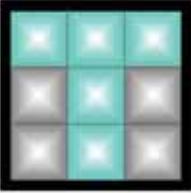
6. Coordination – Although there is room for improvement, infrastructure decisions are generally well coordinated across the service providers and are integrated with broader council land-use decisions.

In summary, the study has enhanced the NIU industry picture through an assessment of individual service providers based on a detailed performance framework endorsed by stakeholders. This has facilitated the identification of improvement opportunities at both the industry and individual service provider level.

Next Steps

A series of next steps for improvement opportunities have been identified. In summary, it is recommended that:

1. Participating respondents utilise the outcomes of their assessments to inform individual business planning priorities.
2. Treasury, NIU, Water New Zealand (WNZ), Local Government New Zealand (LGNZ) and INGENIUM evaluate the desirability and value that could be gained by a possible roll-out of the same or a modified assessment framework across all industry providers nationally to complete the picture that is formed from this pilot study, thereby testing the validity of its findings nationally.
3. Treasury consider how the findings of this study can be incorporated into Government's infrastructure workstream being established through its Better Local Government programme.
4. WNZ work with other key industry stakeholders including LGNZ, INGENIUM and Treasury, to help guide future government and council policy including regulation.
5. NIU inform and update the 2011 NIU recommendations for the urban water sector including the relative priorities. ■



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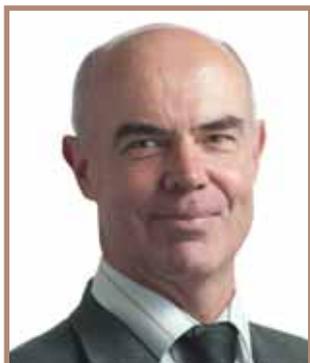
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MWH Global Adds Senior Economist to New Zealand Team



Anthony Byett

Global engineering and strategic consulting firm MWH Global has appointed Anthony Byett as its senior economist to further expand the company's economic advisory services in New Zealand and across the Asia Pacific region.

Based in Auckland, Mr Byett will advise clients in the water and wastewater, transportation, energy and industrial, and commercial markets on the financial feasibility of projects, the prioritisation of expenditure and the use of pricing

to bring supply and demand into balance.

Previously the chief economist for the ASB Bank in New Zealand, Anthony joins MWH with over 30 years' experience in economic research, financial and economic analysis and financial risk management, with particular focus on the analysis and forecasting of financial prices and risks.

His experience includes understanding and communicating economic trends and driving forces, estimating the impact of events on local and national communities, valuation of assets and setting prices for goods and services, including wastewater.

In addition to ASB Bank, Mr Byett has also worked with Paymark, Manukau Water, Oracle, Tenon, the University of Waikato and the University of Auckland in both in-house and consulting capacities.

"We are very excited to have Anthony on board to further the roll-out of our economic network plan service here in New Zealand and to offer the Australian MWH business added value in the water regulation market," said New Zealand leader, Business Solutions Group, MWH Global, Jill Harrison.

"His experience includes understanding and communicating economic trends and driving forces, estimating the impact of events on local and national communities, valuation of assets and setting prices for goods and services, including wastewater."

"We see Anthony's role as providing market leading strategic advice right across the region and we look forward to introducing him to our clients."

Mr Byett says that what has become immediately apparent is the tremendous networking power of MWH, both within and beyond the firm.

"The staff clearly have many skills but just as importantly they have many contacts in the community, and they have shown a readiness to cross fields within the organisation to find others to support their project – this is a powerful combination, not unlike the Web."

"I have the same sense of wonder and excitement starting with MWH that I get when sitting down to explore a new topic on the Web," he said. ■

"Previously the chief economist for the ASB Bank in New Zealand, Anthony joins MWH with over 30 years' experience in economic research, financial and economic analysis and financial risk management, with particular focus on the analysis and forecasting of financial prices and risks."

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New Chairman Creates History at Harrison Grierson Engineers



Margaret Devlin

Respected business leader, Margaret Devlin, has been appointed the new Chairman of the Harrison Grierson Board. Margaret created company history when she became its first independent director in August last year.

Her appointment as Chairman is another first for the company.

Margaret has a highly successful track record including more than 20 years' experience working at senior executive and

director level in both the infrastructure and retail sectors in New Zealand and the United Kingdom.

“Margaret created company history when she became its first independent director in August last year.”

Margaret was previously the Managing Director of the UK water company, South East Water Limited. She is currently Chairman of EPIC Limited, CF Reese Limited, Scott Sheet Metal Manufacturing, and the Waikato Branch of the Institute of Directors and Deputy Chair of WEL Networks Limited. She is also a director of City Care, Moto International Holdings Limited and the Institute of Directors Accreditation Board.

Margaret was a Government appointment to the National Infrastructure Advisory Board and is a co-opted Board member of *Water New Zealand* as well as a member of the Risk Management Committee for the University of Waikato.

Harrison Grierson Managing Director Glen Cornelius said the Board is excited about the leadership, skills and depth of experience that Margaret brings to the company in her role as Chairman. Glen thanked Gary Clark, who has been Chairman of the Harrison Grierson Board since 2009. Gary was responsible for overseeing the managing director appointment and transition. He is now focusing on supporting the Christchurch office at this important time. ■

“Margaret has a highly successful track record including more than 20 years' experience working at senior executive and director level in both the infrastructure and retail sectors in New Zealand and the United Kingdom.”

New Water Reticulation Specialist Offers Comprehensive Product Suite

Newly-created specialist engineering company Aquate is now offering a full range of environmentally-friendly water reticulation solutions designed specifically for New Zealand domestic and commercial applications.

Created by former Hynds Environmental General Manager Peter Carroll, Auckland-based Aquate is now the only New Zealand company offering vacuum, low-pressure grinder and STEP systems, as well as standard domestic and larger custom-designed pump stations.

“In addition, we have the knowledge and experience to work closely with consulting engineers to specify and design the most appropriate technology for any project,” says Peter.

Peter started Aquate after seeing an opportunity to introduce more environmentally-friendly and cost-effective water reticulation systems.

“Historically New Zealand has relied on deep gravity sewerage networks combined with large pump stations, or on-site waste-water treatment and disposal,” he says.

“The problem is that for a lot of developments, particularly those with high ground-water tables and uneven terrain, or those in more remote areas, these solutions are often not the most effective or environmentally sensitive.

“Vacuum sewage systems in particular have an enormous potential in the New Zealand market. I am confident they will become a preferred solution over the next few years because they are cost-effective, resilient, low maintenance and have minimal impact on the environment.”

“I believe that in most domestic and commercial situations, we can now design and supply the best technology – or a combination of technologies – to meet each project's unique needs.

“Vacuum sewage systems in particular have an enormous potential in the New Zealand market. I am confident they will become a preferred solution over the next few years because they are cost-effective, resilient, low maintenance and have minimal impact on the environment.”

“These benefits are already being recognised in Christchurch, where vacuum systems have been chosen for several community sewer replacement schemes.”

Peter has been at the forefront in the development of innovative stormwater and wastewater treatment technologies for New Zealand and the Pacific Islands since 2001.

His efforts to raise professional standards for domestic wastewater treatment and stormwater treatment were recognised recently, when he was elected a Fellow of The Institution of Professional Engineers New Zealand (IPENZ). ■



Engineered geo-polymeric structural resins are used to seal seawall

Technology Transfer from Japan Delivers New Technologies

The world's leading seismic remediation technologies, developed in Japan, have now been introduced to New Zealand by Uretek Ground Engineering, whose earthquake remediation work in seismic regions around the world (Japan, Turkey, USA, Finland) has led to strategic alliances with world's experts.

"We needed to bring Jet Grouting, Jack-on-Grout, and Low Mobility Compaction Grouting to our portfolio", said Andrew Masterson, Construction Business Development Manager.

"In the water sector, Uretek been re-supporting and re-levelling roads above culverts, compacting fill and sealing leaks, and working on dams, weirs, manholes, ports, waterways and sewerage pipelines, successfully sealing them using the geo-polymeric resins."

"Because not only the Christchurch jobs, but many other subsidence problems need special solutions, or a number of technologies working in combination," he said.

"Many people think that Uretek offers only slab lifting, but we have a multi-tool technical approach to resolving ground engineering challenges working with our Japanese partners."

In the water sector, Uretek been re-supporting and re-levelling roads above culverts, compacting fill and sealing leaks, and work-

ing on dams, weirs, manholes, ports, waterways and sewerage pipelines, successfully sealing them using the geo-polymeric resins. Uretek work at docks has included hardstanding stabilisation and re-levelling and re-establishing surface falls towards drains. Subsiding wharves, warehouses and office buildings have been corrected, as well as re-levelling seaport crane rails, and replacement of sub-base eroded by leaking drains. ■

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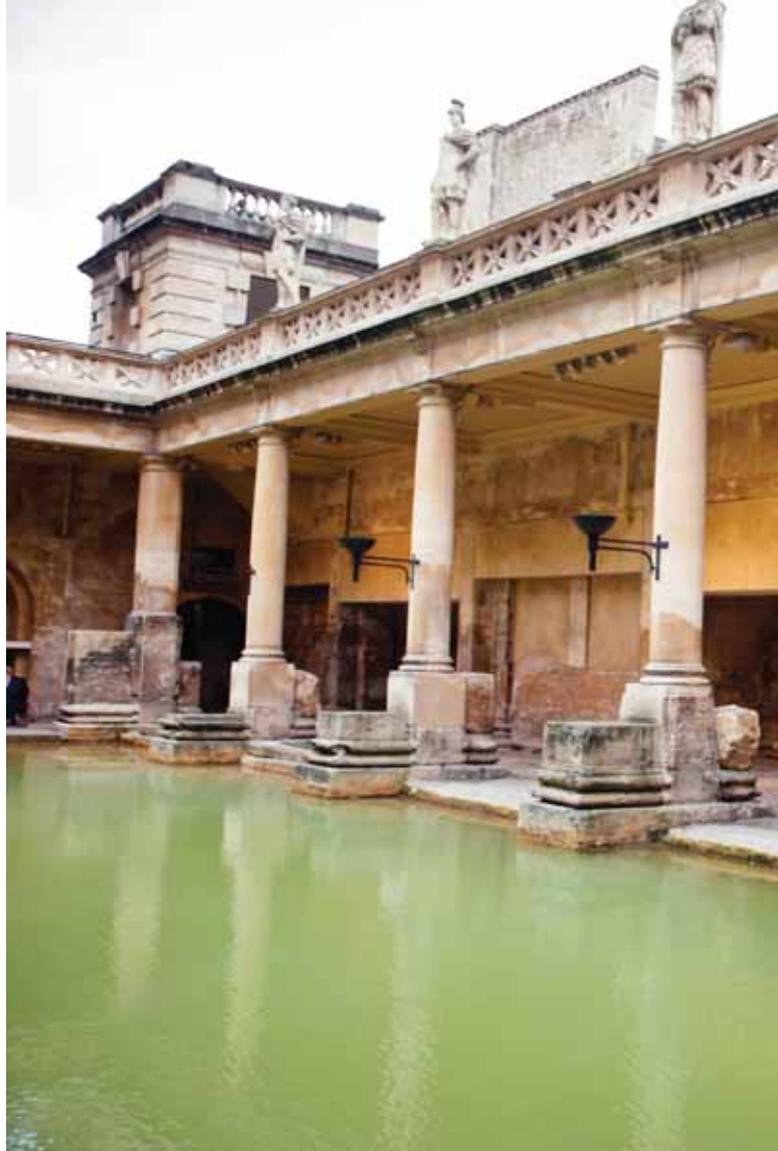
The major benefits are:

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Intercrete™ – The Perfect Solution for the Water and Wastewater Industry

The Romans used concrete to build their empire because of its strength, versatility, durability and for its ability to retain water. The same reasons apply today and concrete is one of the most widely used construction materials particularly in the water and wastewater industry. Reinforcing concrete with steel creates a composite material with high compressive and tensile strength. However, steel is vulnerable to corrosion attack from the surrounding environment which can reduce the overall strength and integrity of the structure.

Issues Experienced in the Water and Wastewater Industry

In the wastewater industry, Hydrogen Sulphide gas (H₂S) is produced which leads to the formation of sulphuric acid (H₂SO₄). The acidic water can lead to severe degradation of the structure potentially resulting in the exposure of supporting steel re-bar, prone to corrosion in the absence of concrete cover. This problem is most commonly experienced in enclosed environments such as anaerobic digestion tanks, sewer linings and manholes.

It is hard to believe that similar deterioration is seen in the clean water industry, however not because of corrosive H₂S but due to soft water, which is very pure. It is known to eat away at the cement within the concrete because it tries to strip away the minerals which are absent from the water.



“Over time, without protection, all concrete structures deteriorate to the point where the structures and the owner are faced with the loss of a valuable asset or contamination of the surrounding area. The cost and time implications of unplanned remediation are severe and often in the water and wastewater industry this is not possible as some areas cannot be shut down for extended periods of time.”

Left – The Romans used concrete because of its special qualities, Below – Soft water attack exposing the aggregates of the concrete column

Over time, without protection, all concrete structures deteriorate to the point where the structures and the owner are faced with the loss of a valuable asset or contamination of the surrounding area. The cost and time implications of unplanned remediation are severe and often in the water and wastewater industry this is not possible as some areas cannot be shut down for extended periods of time. A more effective solution is to embed a maintenance ritual into the plant's existing schedule to include any necessary remediation of the structure prior to treating the asset with a highly waterproof, protective coating.

The use of protective coatings not only reinstates the water retaining characteristics but also increases the longevity of the concrete structure thus increasing the return on the initial investment.

Protective Coatings

International Paint has introduced the Intercrete® product range which is a compact group of products used for concrete repair. They are Portland cement based and show excellent compatibility by chemically reacting with the concrete substrate to become 'one'. These repair mortars and protective coatings can be used in a maintenance context to significantly extend the service life of an existing asset, or at the construction phase to provide long lasting concrete protection, minimising future maintenance.

For the Wastewater Sector

The use of Intercrete 4840 significantly enhances the durability of the concrete in an acidic environment. It is a technologically advanced epoxy and polymer modified cementitious coating with enhanced



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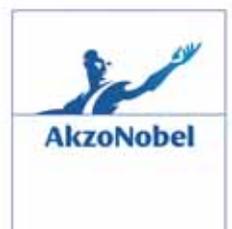
- Waterborne Portland cement based technology suitable for use in confined space
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“The key benefits of the product is that it is easy to install, no substrate primer required and can be applied on damp concrete, making it an economic and practical solution to speed up the remediation process.”

chemical resistance as well as impact and abrasion resistance. Test reports demonstrate that Intercrete 4840 shows good chemical resistance to H₂SO₄ even at 20% concentration. The key benefits of the product is that it is easy to install, no substrate primer required and can be applied on damp concrete, making it an economic and practical solution to speed up the remediation process.

For cases where steel reinforcement bars are exposed, 2 x 1mm coats of Intercrete 4871 may be brushed over to rapidly reinstate the passivating layer providing long term corrosion protection. A repair mortar such as Intercrete 4801 may be applied to fill large defects before using Intercrete 4840 to provide lasting protection.

For the Clean Water Sector

For protection against soft water attack, Intercrete 4841 is designed for the water industry demonstrating no detrimental effect on the quality of drinking water and is commonly used internally on water towers, tanks and reservoirs.

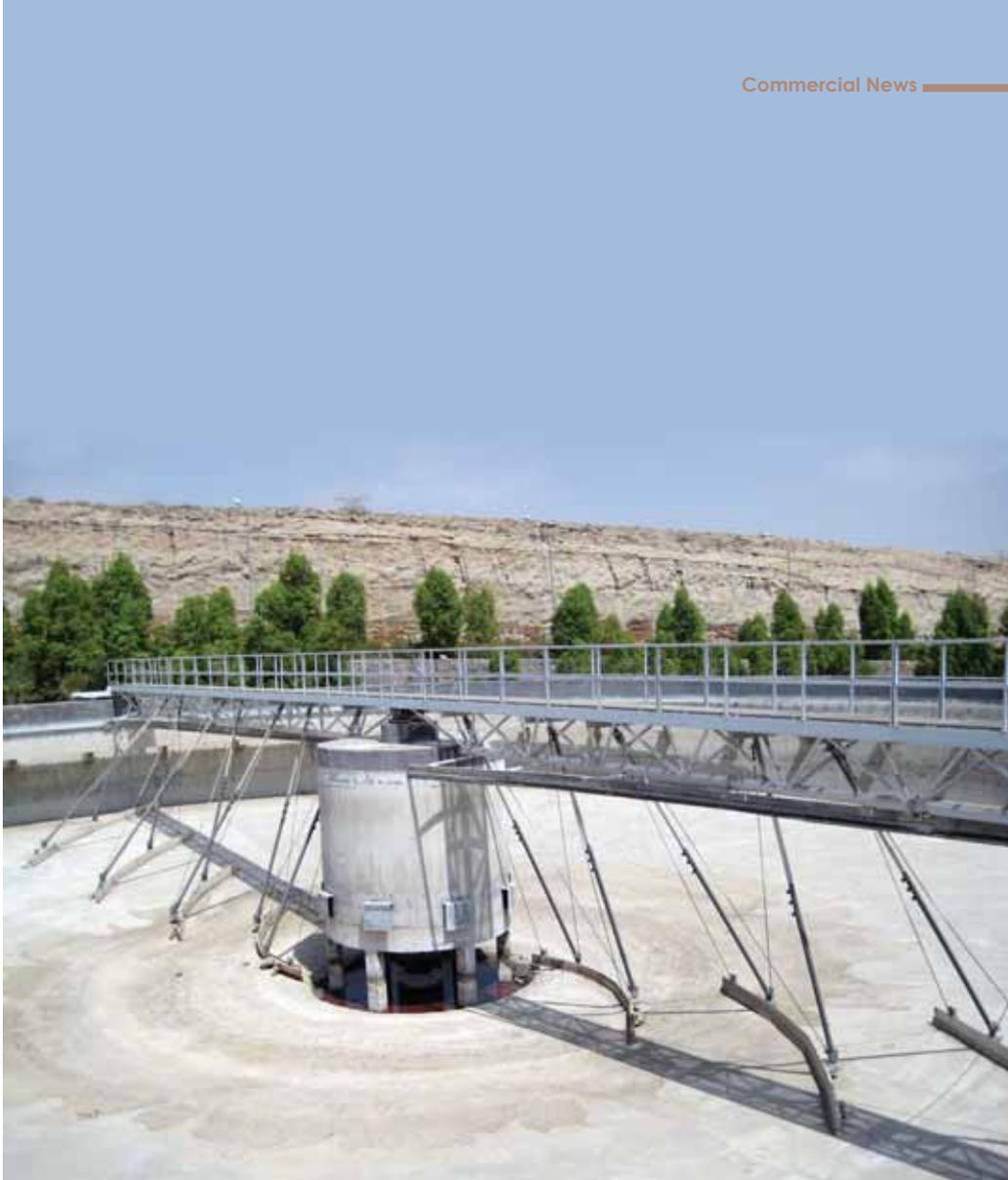
For leaking joints, cracks and areas where movement is expected International Paint offers a range of solutions including Intercrete 4872, a crack bridging flexible tape, and Intercrete 4842 a modified polymer rich flexible cementitious coating to ensure all your protection requirements are met.

Additional Features

The Intercrete product range is waterborne, limiting H&S issues commonly encountered when performing maintenance in confined spaces presented in the water and wastewater industry. The Intercrete range is a compact selection of highly engineered products that can be applied rapidly and effectively in damp conditions with short drying times enabling fast return to service. All the products provide cost effective waterproofing; resisting positive and negative pressure of up to 10 bar.

The advantage of having a concise range of highly engineered products is that it simplifies product selection allowing immediate focus on solving the actual problem.

Intercrete complements our existing range of coatings that have resistance to H₂S and AS4020 approval for potable water such as Polibrid® 705E Elastomeric Urethane and Interline® 975 solvent-free epoxy tank lining. ■



Intercrete 4841 is commonly used internally on water towers, tanks and reservoirs

Case Study

The City of Dunedin's wastewater treatment facility in Florida, U.S.A., processes over six million gallons of wastewater each day, and was experiencing severe degradation of the concrete within its two clarifiers. The concrete was made using limestone aggregate, which was being severely eroded by the acids in the effluent and the chlorine added as part of the treatment. Intercrete 4840, an advanced cement and epoxy modified polymer coating was chosen to provide long term protection in this aggressive environment because of its excellent chemical and abrasion resistance. Following removal of contamination and unsound concrete, Intercrete 4802, a rapid setting repair mortar, was used to reinstate the weirs and effluent roughs prior to the application of Intercrete 4820, a cementitious fairing coat for filling minor defects. 2mm of Intercrete 4840 was then applied to provide long term protection. Work on the first clarifier was completed in 2004 and the second treated the year after. An inspection in 2007, has shown the system to be performing well.



New Zealand-Owned and Operated HTC Specialised Tooling Ltd Celebrates 30 Years In Business

Started in a garden shed with a small consignment of 700 bar Hydraulic Tools from Japanese manufacture Riken Kiki Ltd, 30 years on HTC now distributes over 1,000 product lines from premises in both the North and South Island, servicing a wide variety of industries nationwide.

“It was a gamble but I knew I had the best product for the job and backed it with superior service – a concept which still underpins the business today.”

In the early 1980s the Hydraulic tooling market was dominated in New Zealand by one major distributor, so it was a very large leap of faith by founding Director Roy Huskinson to take the family’s savings and start importing a lesser known but more technically advanced and reliable Japanese product into New Zealand for sale.

“It was a gamble but I knew I had the best product for the job and backed it with superior service – a concept which still underpins the business today,” says Roy.

The initial years were dogged by industry scepticism but this was overcome with reliable and timely supply of product and parts from overseas and, as the company increased market share, requests for additional product lines were made. Within a short six months these requests took HTC from a single product company to one offering jacks and torque wrenches from a range of international manufacturers.

When asked what makes a business successful after 30 years, Roy points to hard work, grit, determination and a commitment to treating customers well.

“From the outset we were determined to be the number one supplier and servicer of industrial hydraulic tools in New Zealand, this



meant providing only the very best equipment and service at the right price to our customers,” he says.

This philosophy has been carried on through current Managing Director and owner Robb Huskinson, who purchased the business from his father in 2003. Under careful direction, the business has continued to build on its strong foundation and now, as well as being a distributor of specialist tools, HTC boasts a hire division and parts and servicing and onsite calibration services.

“From the outset we were determined to be the number one supplier and servicer of industrial hydraulic tools in New Zealand...”



Top left – First Office – Halsey St, Opposite page left – First products, Above right – Roy Huskinson sitting on his deck in 1982 outside HTC's first building – the garden shed

"We sell the best in Hydraulic tools, so it is in our best interest to ensure the product we sell or hire is kept in the highest working order," says Robb.

Having an extensive hire fleet also enables HTC to offer short term hire of product to customers while they service or calibrate the customers own equipment meaning there is very little or no down time for the customer ensuring all product is working to the very highest of standards at all times.

"Under careful direction, the business has continued to build on its strong foundation and now, as well as being a distributor of specialist tools, HTC boasts a hire division and parts and servicing and onsite calibration services."

"Hiring the same equipment we sell, means we test its reliability on an on-going basis and we only sell equipment that lasts in hire," says Robb.

Thirty years on HTC has worked alongside New Zealand's key contractors, engineers and manufacturing plants on a raft of significant projects. And the business continues to grow with new product lines and services being added to ensure HTC always has the right tool for the job and can deliver on its motto of "makin' the hard jobs easy". ■



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Above – ROTO-SIEVE in action, Top – ROTO-SIEVE High Performance Drum Screens in an MBR Plant

Roto-Sieve is ideal for handling rag, grit and stones which are transported out of the screen by the internal auger built inside the drum. Alternative screens used ahead of MBR's are usually installed after the grit trap, therefore requiring an additional screening step, whereas Roto-Sieve is installed ahead of the grit system, eliminating the requirement of an additional screening step. Furthermore, Roto-Sieve's integrated overflow system returns excess flow to upstream of the process train, further protecting the MBR process from damaging solids and fibres.

There are over 4,000 Roto-Sieve drum screens in operation worldwide with more than 100 units protecting MBR plants. Läckeby have recently been awarded a contract to supply 19 Roto-Sieve drum screens to the QingHe Wastewater Treatment Plant (3,000,000 PE) in Beijing, China, which is set to become the largest MBR plant in the world with a capacity of over 240,000m³/day.

Roto-Sieve rotary drum screens are available in five models for flows rates up to 435 litres per second and are supplied in either stainless steel (1.4301) or acid-proof steel (1.4436) materials. Standard drum perforations are 0.8, 1.0, 1.5, 2.0, 2.5mm and the smallest perforation available is 0.6mm. ■

“The high capture rate of Roto-Sieve enables small chain toilet paper fibres to be captured before reaching an MBR pre-aeration zone.”

The Roto-Sieve drum screen is widely accepted as the leading technology for pre-screening at Membrane Bioreactor (MBR) plants. The high capture rate of Roto-Sieve enables small chain toilet paper fibres to be captured before reaching an MBR pre-aeration zone. These tiny fibres, which tend to spin and generate threads, can end up growing into long strands that wrap around the hollow fibre membranes causing backwash of flow and damage to the delicate membrane structures. Roto-Sieve has validated its excellent performance in preventing this problem and is widely recognised as the best available solution.



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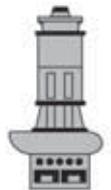
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