



WASTEWATER MONITORING, UPGRADE AND TECHNOLOGY REVIEW 2024

Tauranga City Council | Prepared by Beca & Boffa Miskell | February 2024

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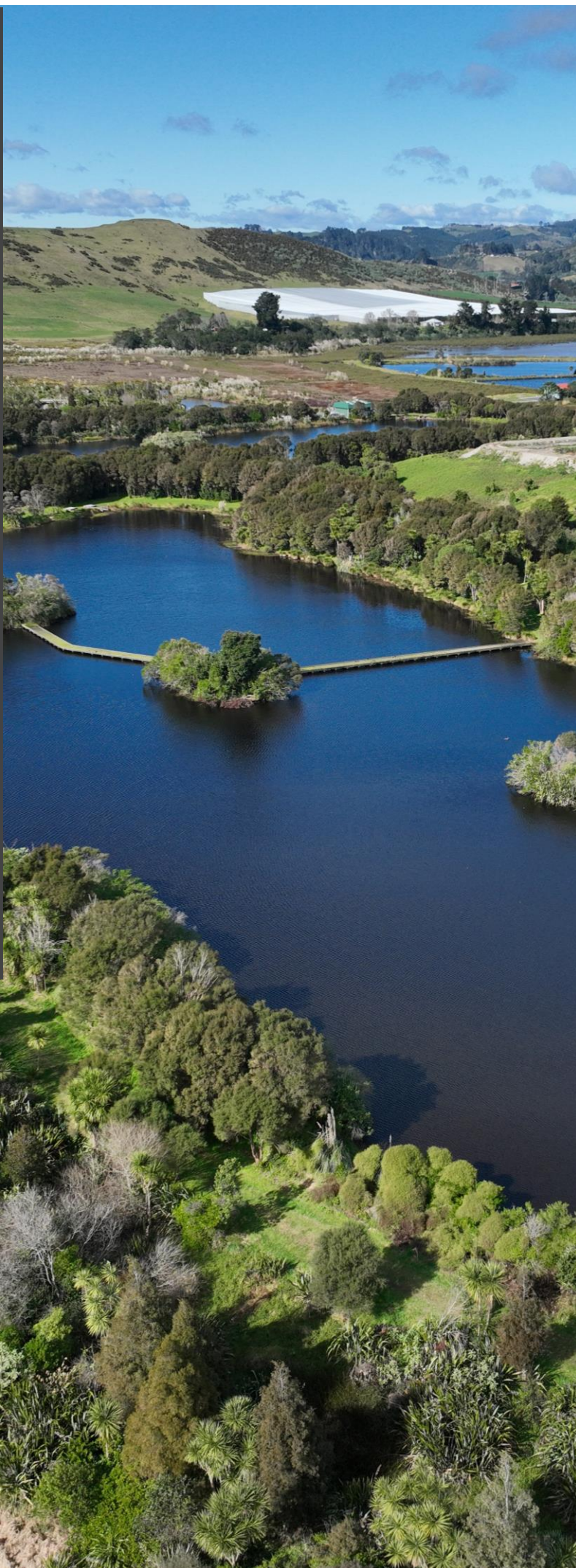
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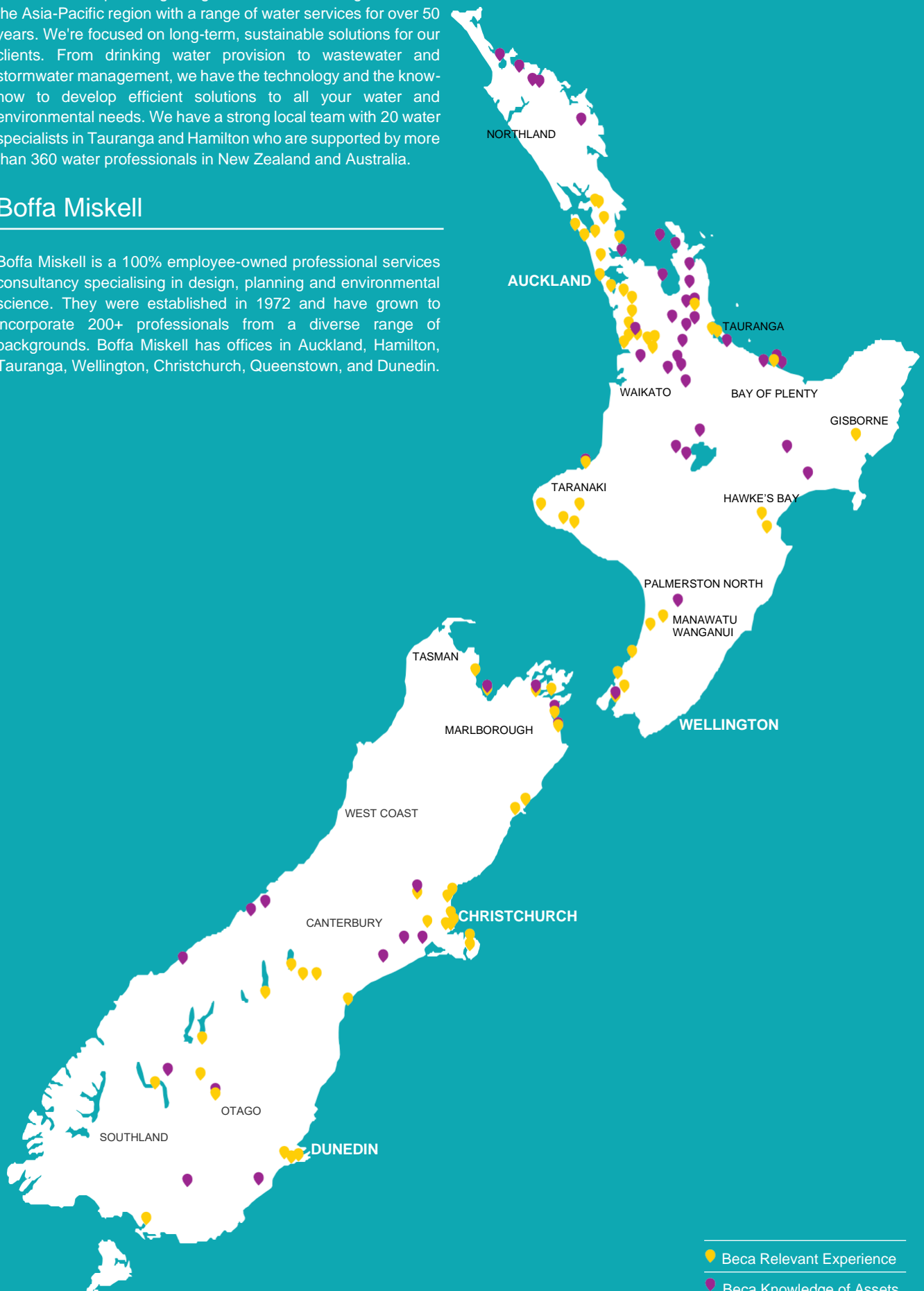


Beca

Beca has been providing design services and strategic advice to the Asia-Pacific region with a range of water services for over 50 years. We're focused on long-term, sustainable solutions for our clients. From drinking water provision to wastewater and stormwater management, we have the technology and the know-how to develop efficient solutions to all your water and environmental needs. We have a strong local team with 20 water specialists in Tauranga and Hamilton who are supported by more than 360 water professionals in New Zealand and Australia.

Boffa Miskell

Boffa Miskell is a 100% employee-owned professional services consultancy specialising in design, planning and environmental science. They were established in 1972 and have grown to incorporate 200+ professionals from a diverse range of backgrounds. Boffa Miskell has offices in Auckland, Hamilton, Tauranga, Wellington, Christchurch, Queenstown, and Dunedin.



● Beca Relevant Experience

● Beca Knowledge of Assets

Wastewater Monitoring, Upgrade and Technology Review 2024

Tauranga City Council (TCC) is seeking a suitably qualified independent New Zealand wastewater specialist to undertake a Monitoring, Upgrade and Technology Review (MUTR) of TCC's wastewater practices and consent compliance. This review is required every five years under the suite of consents that TCC holds for its wastewater system.

To achieve this, TCC needs experienced specialists who can provide independent advice on progress towards planning and environmental targets, technological and legislative changes, and consent compliance.

Five years ago, we (Beca) prepared the last MUTR which was accepted by the Wastewater Management Review Committee (WMRC) and Bay of Plenty Regional Council (BOPRC). Our extensive knowledge of TCC's wastewater scheme allows us to prepare a draft MUTR quickly and efficiently to meet project timeframes. We are independent of TCC and their wastewater operations team.

National experience supported by a local team to deliver robust advice

Beca has provided wastewater engineering services to local authorities across New Zealand and Australia for more than 60-years. Our partner, Boffa Miskell has also provided specialist advice for more than four decades.

Our team has been involved with almost all municipal wastewater treatment plants across New Zealand and bring considerable technological knowledge and benchmarking of industry best practice.

Our technical lead, Garry Macdonald and technical reviewer, John Crawford have extensive experience in the design, construction, commissioning, and operation of wastewater treatment plants, with a combined knowledge of over 85 years in NZ and overseas. They will provide independent, robust technical advice on the performance of TCC's wastewater treatment plants and advice on technological changes and advances in wastewater treatment, disposal, and re-use over the past 5 years.

Our environmental specialist, Garrett Hall has led several key wastewater consent projects in Auckland, Waikato, and Hawkes Bay over the last decade. Garrett will review TCC's monitoring results for the last 5 years against resource consent conditions and provide advice on the adequacy and scope of TCC's monitoring regime. Garrett and Garry will provide an update on recent and proposed legislative changes affecting the water environment in NZ, and how these could impact on the Tauranga wastewater system and ocean outfall discharge.

Marine ecologist, Sharon De Luca of Boffa Miskell is known nationally for her work on large infrastructure projects and locally for her extensive knowledge of Tauranga's marine ecology. Sharon will provide specialist advice on monitoring of marine flora and fauna.

Our project manager, Celia Walker will coordinate the technical specialists to prepare the overall MUTR report and facilitate workshops with the WMRC and BOPRC. Celia has project managed and been involved in stakeholder engagement for three waters projects in Tauranga for more than a decade and is well known to TCC.

Profiles of our key personnel are shown in the Project

Personnel section and full CVs are provided in Appendix A.

Technology advances through global collaboration

Beca has a long history and successful track record of collaboration with international consultancies in order to stay up-to-date with technological advances in various fields of engineering expertise.

Currently, we have an exclusive relationship with the global consulting engineering company, Black & Veatch, whose head office is in Kansas City, as well as offices around the world.

Our key technical leaders like Garry Macdonald and John Crawford regularly attend and present at NZ and international conferences and technology exhibitions. Through this avenue, they develop longstanding contacts with water and wastewater utilities in the USA, Australia and Denmark and have arranged for their experts to input into our NZ projects as well as to visit our NZ clients.

For example, over the past 18 months, Garry Macdonald and John Crawford have led two short study tours with clients, including TCC, to multiple North American utilities to keep abreast of what is happening in advanced wastewater treatment, resource recovery from wastewater, recycled water, and biosolids management in North America. Their expertise, technology choices and lessons learned can be applied to the New Zealand context and knowledge utilized in undertaking the MUTR for TCC.

Key factors to consider in the MUTR

Condition 20 of Consent 62878 (treated wastewater discharge) requires TCC to prepare a MUTR report every 5 years which should consider the following:

- Progress towards TCC's objective of "towards zero waste"
- Progress in adoption or promotion of Smart Growth Stretch Targets
- Technological changes and advances in relation to wastewater management, treatment and disposal and beneficial re-use technologies which may be relevant to the ongoing operation of the Wastewater Scheme, including the availability of alternatives to the current waterborne wastewater system such as waterless toilet systems.
- The results and associated assessment of the permit holder's sampling monitoring undertaken in accordance with the resource consents, including the adequacy and scope of such monitoring and sampling.
- Ongoing compliance with the requirements of all relevant resource consents particularly in relation to any reported non-compliance with consent conditions.
- The implications of any relevant changes in legislation or policy relevant to the ongoing operation or compliance of the Wastewater Scheme, including standards relevant to receiving environments affected by the Wastewater Scheme
- The cost of any potential technological changes having regard to the best practicable option for addressing the relevant issue

As freshwater becomes scarcer, globally there has been an appreciation for "Wastewater" is a potentially valuable resource. Recovery of resources such as water, energy (as biogas and heat), nutrients (such as phosphorus and nitrogen) and organic material (as biosolids) is growing in breadth and scale across the world.

There is also increasing knowledge and interest in "contaminants of emerging concern (CECs)" such as microplastics, pharmaceuticals and personal care products.

With the technical experience and knowledge, we will consider and address these topics in the MUTR.

The consent also states that the:

- WMRC should make recommendations to TCC in relation to the independent consultant to be appointed to undertake the MUTR report.
- MUTR be prepared in consultation with the WMRC, BOPRC and any key stakeholders or iwi groups identified by the WMRC.
- Tangata whenua may prepare a paper for submission to the independent consultant on the outcomes of any cultural monitoring or any other issue relevant to the operation of the permits

Our team roles are summarised in the table below:

Review Area	Technical Experts
Progress towards targets/compliance with consents	Garrett Hall
Technology review	Garry Macdonald and John Crawford
Legislative update	Garett Hall and Garry Macdonald
Environmental monitoring	Sharon De Luca (marine ecology) and Garrett Hall (all other monitoring)
Project Management/ Report Compilation	Celia Walker

Proposed additional sustainability factors to include in the MUTR

Since the comprehensive wastewater consent was granted by BOPRC to TCC in 2006, there has been increased focus in New Zealand on the following sustainability factors which influence the planning and operation of key infrastructure:

- Climate Change Mitigation e.g., Greenhouse gas emissions reduction, carbon reduction and energy management
- Understanding and resilience to natural hazards, including climate change adaption
- Te Mana o te Wai

Whilst these specific factors are not a requirement of Condition 20 of Consent 62878, we propose that the MUTR report also reviews TCC's progress in considering these factors in the planning and operation of its wastewater treatment plants. This would provide a greater assurance to the WWMRC and BOPRC that TCC is acting and planning in accordance with these factors.

Proposed Timeline

TCC is seeking a professional services provider who can carry out an independent assessment of TCC's wastewater practices and consent compliance.

A key component of this is the cultural assessment of the wastewater scheme which may be provided by tangata whenua (if they wish to do so). We propose that we provide a draft MUTR report which summarises monitoring results and compliance over the last 5 years and provides progress towards planning and environmental targets, technological and legislative changes in February 2014.

This would be presented to the Wastewater Management Review Committee at a workshop and would allow tangata whenua to reference this information when preparing their own cultural assessment.

We propose the timeline below for your consideration (this is subject to feedback from the Wastewater Management Review Committee):

- June 2024 – draft MUTR report presented to Wastewater Management Review Committee during workshop 1
- April to October 2024 – cultural paper prepared by tangata whenua; update MUTR with any feedback from workshop 1
- November 2024 – cultural paper presentation at workshop 2
- Update MUTR to include cultural paper and with any feedback from workshop 2
- March 2025 – submit final MUTR report to committee for approval prior to sending to Bay of Plenty Regional Council



Project Personnel



Garry Macdonald | Technical Lead

Qualifications and Training

Bachelor of Engineering (Civil), (First Class Honours), Master of Engineering (Civil) (Distinction), Distinguished Fellow EngNZ, CMEngNZ, Honorary Life Member Water NZ, WEF Fellow, Board of Trustees, WEF (2011-15 Washington DC, USA), Board of Trustees, OXFAM NZ (2012-2020)

Relevant Experience

Garry is Market Segment Director for Beca and is widely recognised as an expert in wastewater and environmental engineering with over 48 years' experience in a wide variety of wastewater and environmental engineering projects, both in New Zealand and abroad. Garry has held project leadership and Technical Director roles in many of the major wastewater master planning and treatment and disposal projects carried out by Beca in the last 35 years, including numerous projects for Watercare Services and for Tauranga City Council (as well as other large Council clients) since moving from Christchurch to Auckland in 1993. He has also led peer reviews on major projects ranging in value from \$25M to \$100M for several NZ clients where work has been undertaken by other consultants. Garry has a high-profile governance and leadership involvement in many industry organisations, including Water Environment Federation (WEF), Water NZ and Engineering NZ (previously IPENZ). He is currently the Global Leader for the Technical Program Committee for WEFTEC, one of the largest annual water, wastewater and stormwater conferences, a role in which he sees world-leading technologies being presented to over 25,000 delegates. Through this involvement, Garry is connected with a large number of fellow technical experts in USA, Europe and Australia from whom he can draw advice and expertise on behalf of our NZ clients.

Role on MUTR Project

Garry will provide input to the technology review as well as to the update on national legislation and future trends relating to fresh and marine water management and discharges. He will also be the overall verifier of our final reports and will present these to the WMRC.

Practical Experience

Garry's attached CV demonstrates his extensive experience on wastewater collection and treatment schemes, outfalls consenting and design, and wastewater network master planning. He is currently Project Director for the Tauranga Wastewater Treatment Framework Contract (since 2014) and is involved in technical leadership roles for wastewater treatment and biosolids projects in Auckland (Watercare), Whangarei, Hamilton, New Plymouth, Napier, Gisborne, and Te Awamutu.



John Crawford | Specialist Technical Input

Qualifications and Training

BE (AG) Hons, CMEngNZ, CPEng, Certified Resource Consent Decision Maker

Relevant Experience

John is a Technical Fellow for Wastewater Engineering at Beca. He has 38 years' experience in a wide variety of environmental engineering projects in New Zealand, Singapore, Fiji, Malaysia, and the UK. He has been based now in Hamilton for the past 29 years.

John's experience covers the full range of project services for wastewater treatment, from investigation to consenting, design, implementation, operations, condition assessment and valuation. He regularly provides expert evidence and peer review on wastewater process and related engineering matters. John is well versed in resource management issues being certified to sit as an RMA Commissioner. John has an ability to understand and discuss, in a manner which lay people can readily understand, all aspects of wastewater technology and practice. John has an ability and manner that allows him to 'get alongside' operations teams and really understand their needs on site. He also makes a considerable effort to maintain currency with what is happening internationally in the WW market.

With a strong background in both wastewater treatment engineering and consenting John is ideally suited to this project. In recent years John has developed a reputation for being able to work alongside tangata whenua, to identify their concerns and beliefs and develop pragmatic technical and consents solutions accordingly.

Role on MUTR Project

John will provide input to the technology review and latest technological advances in relation to wastewater management, treatment and disposal and beneficial re-use technologies, including the availability of alternatives to the current waterborne wastewater system.

Practical Experience

John's CV demonstrates an extensive list of wastewater projects. They demonstrate considerable experience with the interrelated disciplines of process engineering, obtaining, and managing wastewater discharge consents and ongoing engagement with tangata whenua and other stakeholders on these issues.



Garrett Hall | Environmental Lead

Qualifications and Training

BSc (Physical Geography), MSc (Hons) (Environmental Science and Chemistry), Certified Environmental Practitioner (CEnvP), Associate of the Institute of Environmental Management and Assessment (AIEMA), Member of the Resource Management Law Association (RMLA), Associate Member of the New Zealand Planning Institute (Assoc. NZPI), Making Good Decisions RMA Commissioner Training

Relevant Experience

Garrett is a Technical Director based in our Auckland office and has over 23 years' experience. He has extensive leadership skills in wastewater discharge consenting projects and has previously prepared Monitoring, Upgrade and Technology Review Reports (MUTR) to meet the requirements of the Tauranga (2019), Ruakaka/Marsden Point and Pukete (Hamilton) wastewater resource consent conditions. The requirements of the Ruakaka and Hamilton review reports are very similar to the TCC wastewater consent and Garrett therefore has direct recent experience in preparing these types of reports for local authorities.

Role on MUTR Project

Garrett will assess TCC's progress towards zero waste and Smart Growth targets and compliance with consent conditions. Garrett will also lead the review of TCC's monitoring and sampling regime and the implications of legislative changes affecting the ongoing operation of the wastewater scheme.

Practical Experience

Garrett has recent significant experience successfully leading complex multi-year wastewater consenting projects (from commencement to completion) and can bring these experiences together, alongside key skills in working collaboratively with mana whenua, to benefit the TCC Monitoring, Upgrade and Technology Review Report (MUTR).

He has worked for several years successfully delivering wastewater consent related projects for Far North District Council, Watercare, Waikato District Council, Waipa District Council, Hamilton City Council, Hastings District Council, Whangarei District Council (Ruakaka/ Marsden Point), Palmerston North City Council and various other wastewater related projects for local government clients throughout New Zealand.

Garrett has wide-ranging experience leading and coordinating teams responsible for the technical and planning investigations required for resource consent applications for water supply, wastewater, stormwater, and transportation infrastructure.

He has presented expert evidence at council hearings and the Environment Court. He is a Certified Environmental Practitioner (NZ), a Practitioner Member of the Institute of Environmental Management and Assessment (PIEMA), an Associate Member of the New Zealand Planning Institute and has completed the Independent Commissioner Training under the Ministry for the Environment's Making Good Decisions Programme



**Celia Walker | Project Manager/
report compilation**

Qualifications and Training

BSc (Hons) Environmental Science, HND Sewage Treatment and Sludge Disposal, PRINCE2 Project Management, Member of the Institution of Water and Environmental Management

Relevant Experience

Celia has 20 years experience in the public and private water sector within New Zealand and the UK. With a background in Environmental Science and Wastewater Treatment, Celia has specialist skills in planning and asset management for wastewater, water supply and stormwater infrastructure and has held a wide variety of project and programme management roles.

In recent years, Celia has worked for the Ministry for the Environment, Wellington Water and Tauranga City Council.

Role on MUTR Project

Her role will be project management and compilation of the Monitoring, Upgrade and Technology Review Report and facilitation of workshops.

Practical Experience

Celia has good understanding of TCC's wastewater system through her work with TCC over the last 17 years.

Recent experience includes project management and co-development of the TCC 30-year infrastructure plan for wastewater treatment, which identified assets requiring upgrade for input into the Long-Term Plan.

Celia was the Project Manager and key client contact for Beca's inputs into Tauranga's first Climate Action and Investment Plan, which included actions for three waters activities.

In 2016 Celia was seconded into TCC as a Strategic Planner for the Environment, which included leading the early development Tauranga Taurikura, including external and internal engagement activities, and working with iwi/hapu partners.

Celia worked for Tauranga City Council in the City Waters Team from 2006 to 2013, which included managing and working on projects such as the Papamoa Comprehensive Stormwater Consent, Water Demand Management initiatives, Low Impact Design and Biosolids Strategies. This involved working with iwi/hapu partners and presenting to the WWMRC and Council on numerous occasions.



Sharon de Luca | Associate Partner / Ecologist (Boffa Miskell)



Qualifications and Training

Independent Hearings Commissioner, Ministry for the Environment
Doctor of Philosophy, Environmental and Marine Science, University of Auckland,
Bachelor of Science, Zoology, University of Auckland

Relevant Experience

Sharon has more than 25 years' experience in marine ecology and 19 years' experience in freshwater and terrestrial ecology. She has worked for Boffa Miskell for eighteen years on a wide range of projects located throughout the country.

Sharon's approach is strongly based in ecological principles, coupled with a passion for ensuring technically robust and innovative environmental outcomes. Her ecological assessments and advice have the rigor to withstand scrutiny in Environment Court and Board of Inquiry Hearings where she has presented expert witness evidence for many significant projects.

Role on MUTR Project

Sharon's role is to review TCC's monitoring and sampling regime and consent compliance with regard to marine ecology.

Practical Experience

Sharon's most recent relevant experience for TCC includes:

- Survey of Effects of Wastewater Discharges: Assessment of the quality of the intertidal and subtidal marine receiving environment at Omanu Beach, including shellfish abundance, quality, diversity, sediment quality, faecal microbiology survey, and stable isotope assessment. Report submitted to TCC in 2014 and accepted without revision. Current survey being carried out January/February 2024.
- State of the Receiving Environment Annual Assessment of the quality of the freshwater, estuarine and marine stormwater receiving environments in Tauranga City, involving survey of sediment and water quality, microbiological indicators, marine and freshwater invertebrates, and freshwater fish (2012 to current).
- Rangataua Bay estuarine mud snail annual assessment, adjacent to the Te Manga Wastewater ponds annual report to TCC.
- Te Maunga Closed Landfill Consent, Assessment of estuarine ecological features relating to leachate discharges for PDP for TCC.
- Marsden Point Refinery Wharf Discharges (2019-2020), Report for Refining NZ, Assessment of effects on marine receiving environment from structures in the CMA and discharge of treated wastewater and stormwater.
- Port of Tauranga Stormwater Consent, 2017-2019. Report of the assessment of effects on marine ecological values.
- Maintenance Discharges from the Auckland Harbour Bridge, 2011 and current. Assessing the effects of the discharge of various contaminants to the marine environment through maintenance of the surface of the Auckland Harbour Bridge.
- Watercare Central Interceptor, Watercare 2012-2013. Assessment of construction of wastewater infrastructure within the Manukau Harbour.
- Comprehensive Stormwater Consents. Assessment of effects of the discharge of stormwater to freshwater and marine receiving environments to support comprehensive discharge consent.

Reference Projects

Waikato Metro Wastewater Treatment Business Case & Site Selection

The Hamilton-Waikato Metropolitan Area (Metro Area) is the urban sub-region of the Waikato. It is centered around Hamilton City as the core but extends from Taupiri in the north to Te Awamutu and Cambridge in the south. The Metro Area sits across three local authority jurisdictions (Waikato District, Hamilton City, and Waipā District).

Historically, each of the three local authorities in the Metro Area have planned and funded wastewater infrastructure separately. This infrastructure is aging, often does not have capacity for anticipated growth, and generally does not provide the level of treatment that would be expected from a modern wastewater treatment plant.

Beca staff formed part of the team developing the **Three Waters strategy for the long term** (10, 30 and 100 year) infrastructure development and coordination needs of the Waikato River Valley corridor between Cambridge, Te Awamutu and Papakura. This was undertaken in conjunction with central Government's multi-disciplinary considerations of infrastructure requirements for the corridor including transportation, housing, and employment.

The Metro Wastewater Detailed Business Case programme is the first step in investing in the long-term future of the wastewater infrastructure needs identified by the strategy study.

Waikato Northern Metro Wastewater Detailed Business Case

The Beca Team Developed all aspects of the Northern Metro Detailed Business Case except for the financial case. This included strategic background, technical analysis, development of options, cost estimation, and commercial and management recommendations.

John Crawford was part of the team who modelled and developed concepts for the redevelopment of Pukete WWTP to transition to near 'limit if technology' performance with more than double the current population.

The Beca team also ran an optioneering process for identification of a preferred option for long-term wastewater servicing in the Northern Metro Area. They facilitated a series of successful on-line technical MCA workshops. The interactive online workshop format allowed all participants from four different organisations to indicate how they thought each option should be scored, with space for challenge and discussion.

The Beca technical team presented the MCA workshop outcomes and high-level overviews of the options to a series of hui with iwi partners as part of a process to consider the maatauranga aspects of the options. The iwi partners then developed their own parallel assessment process, based on the objectives of Te Ture Whaimana o te Awa o Waikato.

The mana whenua assessment was considered alongside the MCA, costs, and consideration of risks to determine a preferred option that was supported by all parties.

Hamilton Southern Wastewater Treatment Plant Site Selection

One of the recommendations of the Waikato Southern Metro Wastewater Detailed Business Case was development of a new wastewater treatment plant to service the south of Hamilton City,

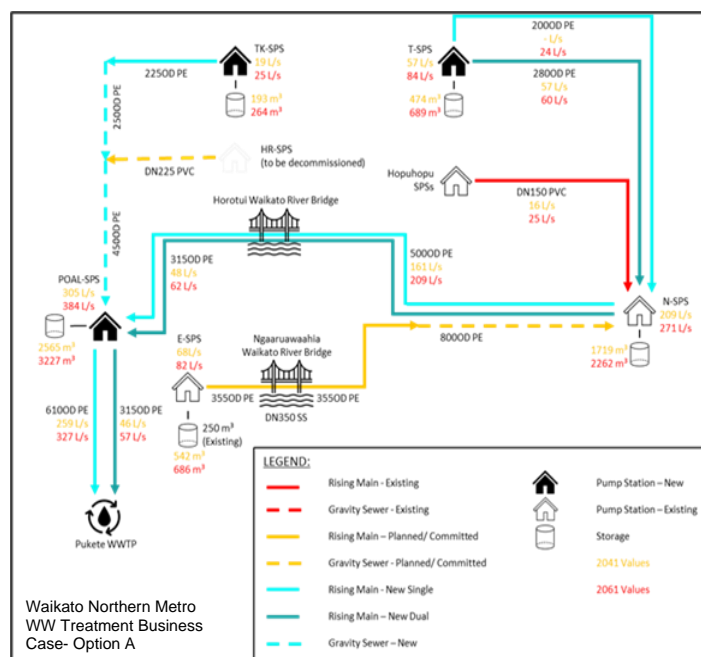
Hamilton Airport, and surrounding area. This project includes a similar optioneering process to the Waikato Northern Metro Wastewater Detailed Business Case.

The MCA assessments are based on desktop studies, treatment plant concept, site walkovers, and limited site investigations covering operability (for both the plant and conveyance), constructability, soil and geotechnical conditions, effects on the natural environment (ecology, natural character, soil contamination, water quality) and effects on the built environment (landscape and visual, odour, noise).

For this process, mana whenua undertook a parallel assessment using a Matariki Framework based on a framework developed for a similar project in the region. That process is being undertaken independently and is on-going.

Delivery of Services

Key services include Facilitation of business case processes, Business Case writing, optioneering and MCA processes, consent strategy advice, process modelling, consideration of effects on the natural and built environment (ecology, water quality, landscape and visual, odour, noise, contaminated land, groundwater, geotech, groundwater), concept design for wastewater treatment and conveyance.



Pukekohe Wastewater Consents and Design Project

Beca led the design of this upgrade, right through to the Commissioning Phase. The upgrade has been designed to achieve a total nitrogen concentration below 4 mg/L and total phosphorus concentration below 1 mg/L, some of the highest discharge standards in New Zealand. The upgraded plant is now fully commissioned and meeting the consent conditions.

Background

Te Ture Whaimana requires a continuous improvement in the health and wellbeing (water quality) of the Waikato River over an 80-year period. The final treatment solution (conversion of the SBR to a Membrane Bioreactor with new UV disinfection facility), sought to improve the water quality of the Waikato River from its current state to meet the aspirations of the Vision and Strategy.

Risk Management

The upgrade was a true brownfield project with the new facilities being fully integrated with the existing plant including the reuse of the two existing SBRs, making the sequencing of the project critical to its success. The project required that there was no reduction to the capacity of wastewater treatment during the construction phases and that consent conditions were met at all times. Detailed tie-in and sequencing planning was undertaken to manage the risks of interruption to the existing plant. The design took into account temporary operating modes during construction, e.g. additional aeration included in the new bioreactor to enable it to treat full plant loads during the retrofit of the existing SBRs as flow through reactors. Regular risk reviews were carried out during construction and commissioning to keep the design, construction, commissioning and operations teams informed of all current risks and the mitigation in place.

This project is relevant to TCC MUTR as provides a recent example of conversion of a brownfield site to a more advanced treatment process with detailed considerations of the ongoing operation of the existing plant.



Pukekohe WWTP

Gisborne WWTP Stage 1&2 Upgrades

Stage 1 of the Gisborne WWTP was designed by Beca and completed over a 3-year period between 2007 and 2010. Stage 1 included industrial separation, millscreening, grit removal, a biological trickling filter plant (BTF) and outfall pump station. The Stage 2 upgrade, includes preliminary and detailed design of additional liquid stream processes and a new solids stream process on the Stage 1 WWTP. This includes upgrades to the sludge treatment process, U.V disinfection of filtered effluent, and odour treatment. Construction of Stage 2 started in 2022 and was completed at the end of 2023 within the overall budget of \$35M, and the new plant is currently in the performance proving stage. Disinfected, tertiary-filtered effluent combines with pretreated industrial wastes and is discharged through a 2000m long ocean

outfall into Poverty Bay.

Continuous improvement in the quality of the wastewater discharged through the 60-year-old outfall has been a multi-decade journey for the city and its 35,000 residents. A consent for a new secondary treatment plant was granted in 2006 and required the formation and active participation of iwi and elected members through a Wastewater Management Committee (WMC) and a Wastewater Technical Advisory Group (WTAG). The ultimate aim for the Gisborne community, particularly of iwi, is the complete removal of wastewater of human origin from the ocean. The quality of the Stage 2 effluent is such that several “reuse” options, or wetlands enhancement, are now available for Council to progress.

Beca's Role

Our design was completed using a 3D modelling format which enabled full interaction with GDC Operators and the WWTP Manager through optioneering, SiD, HAZOPS and the Value Engineering exercises. The 3D model also enabled communication of the project to GDC elected members during Council meetings and workshops. This upgrade is one of the largest capital projects facing GDC so Councillors were very interested in the design details and out-turn cost. As the scope changed to reduce cost, councillors needed assurance that the project objectives would still be met.

Particular areas of innovation in this project are:

Use of lamella clarifiers to remove the biomass sloughed off the BTF which meant a lot less ground improvement and less susceptibility to differential settlement in an earthquake.

Use of screw presses for dewatering the settled solids – validated at Gisborne through a screw press trial using a pilot lamella unit and based on our successful installation of screw presses at Tauranga/Te Maunga WWTP. Due to their internal drainage configuration, screw presses perform well as single-stage thickening and dewatering devices, avoiding the need for a separate “thickening” unit. They are also much lower power consumption than centrifuges which are more normal in New Zealand WWTPs.

A final effluent, recycled water system is not unusual in WWTPs, but at Gisborne the recycled water system will completely displace the use of potable water for all washdown and process-related purposes, saving in the order of \$200- \$250k per annum. With the GWWTP being one of the largest uses of potable water in the city, this will reduce the demand on the drinking water supply.

Lower capital costs and embodied carbon - through the removal of several large concrete and steel buildings from Stage 2 which were in the preliminary and final designs, to house amongst other things process equipment, stores and all MCC and Control room functions. We also reduced the embedded carbon in the structural steel required for the project by lowering the dewatering screw presses from a 3m high elevated steel framed platform down to ground level with individual access stairs, and no fixed provision for overhead lifting.

In relation to our original preliminary design cost estimate, our first round of VE produced cost savings in the order of \$3 – 3.5m, mainly through the removal of a large high-level building with overhead crane housing the screw presses, stores, MCC, Control Room, and associated ancillary plant. The subsequent VE and ECI exercises have removed a further \$4-4.5m of capital costs, through changes in the ground improvement design, removal of a sludge tank, postponement of a new septage reception facility, removal of the enclosed solids loadout truck building, reduced air volumes for odour control and dropping the screw presses to ground level (previously

on an elevated platform) with discharge to spirotainers. This led to a consequential reduction in the contractor's P&G and margin of about \$2-2.5m due to the reduced scope and an easier to construct facility with a shorter construction programme. Where possible – in a plant configuration driven by gravity-hydraulics - we have tried to minimise stairs and elevated

platforms to reduce trip and fall hazards. Working with the operators in the SiD workshops, we identified where visual inspections were needed for monitoring performance and maintenance access and designed the walkways and platforms and external lighting locations accordingly.



Gisborne Tertiary Treatment Plant (Stage 2)

A photograph of the Te Maunga Wastewater Treatment Plant (WWTP) at sunset. The image shows a large, modern concrete building with multiple levels and large windows. In the foreground, there is a large circular concrete tank filled with dark water, reflecting the sky and the building. A metal walkway with railings and yellow safety markings runs along the edge of the tank. To the left, a large white cylindrical storage tank is visible. The sky is a mix of orange, yellow, and grey, indicating the time is either dawn or dusk. The overall scene is industrial and well-maintained.

APPENDIX A - CVs

**make
everyday
better.**



Garry Macdonald

Project and Technical Director of Environmental Engineering

Business Development Director – Water Market Segment

Bachelor of Engineering (Civil), (First Class Honours), University of Canterbury 1974

Master of Engineering (Civil) (Distinction), University of Canterbury, 1975

DistFEngNZ, CEngNZ, Honorary Life Member Water NZ, WEF Fellow

Garry is widely recognised as an expert in wastewater engineering with over 48 years' experience in a wide variety of wastewater projects, both in New Zealand and abroad. He has a high-profile involvement in many industry organisations. Garry has held project leadership roles in most of the major wastewater projects carried out by Beca in the last 34 years and has led peer reviews on major projects ranging in value from \$25M to \$100M. He has received several prestigious industry awards and presented over 60 technical papers in industry publications and at conferences in NZ, Australia, and USA.

Citizenship

New Zealand

Special competence

- Wastewater treatment and disposal systems
- Policy, Regulations, and Guidelines
- Masterplanning urban infrastructure
- Odour investigation and control
- Disposal and dispersion - river and ocean outfalls
- Environmental and feasibility report writing
- Peer Reviews

Relevant experience

Beca Steven/Steven Fitzmaurice and Partners Ltd, Christchurch, New Zealand, 1976 – 1993

Beca Ltd, Auckland, New Zealand, 1993 – present day

Tauranga City Wastewater Treatment Framework Contract

Project Director for this 5+3+3-year term contract covering all investigations, concept design, detailed design, and implementation of new and upgrade works for Tauranga's two wastewater treatment plants, effluent conveyance and storage and ocean outfall. The two plants are very different in their main process units and their age, and one of the first tasks to be undertaken is a new "master plan" for the city's wastewater system that optimises the sunk costs and the way the two plants are operated in a fully integrated manner. Some of the major multi-million-dollar sub-projects undertaken or underway for this framework contract have been:

- New elevated inlet works (influent lift pump station, milliscreens and grit removal) at Te Maunga WWTP to double peak wet weather flow capacity and increase the resilience of the WWTP headworks (to be completed in 2025/26)
- Third clarifier at Te Maunga WWTP to increase the capacity of the plant and provide redundancy and a higher level of resilience (to be completed in 2024)
- Concept design for the third bioreactor at Te Maunga WWTP (currently underway in 2024)
- Second bioreactor for additional capacity and to provide process redundancy (due for completion in 2025)
- Replacement landline from the treatment plant to the ocean outfall for greater capacity
- New sludge thickening (PFTs) and screw press dewatering facility

- 30-year masterplan for the Te Maunga WWTP, final effluent disposal through landline and new outfall
- New grit processing and influent connection chamber
- New blower and full fit out of Bioreactor #1 with new diffusers
- New standby generator
- Biosolids masterplan for the two WWTPs including dewatering and eventual solar sludge drying.

NZ Government (Department of Internal Affairs (DIA)) – Three Waters Reform Programme

Project Director for various work packages from DIA through a subcontract with EY on commercial and technical aspects associated with the Three Waters Reform which the Government is implementing 2020-24. It is proposed that this will result in the responsibility for owning, upgrading, operating, and maintaining three waters assets being transferred from 67 local councils to 3-6 new statutory bodies, or Water Service Entities (WSEs). The work that Beca is doing includes collecting operating and asset information from Councils; investigating the option of including “stormwater” in with the other two waters (water supply and wastewater); GIS mapping of potential WSEs across multiple Councils and mega-catchments; and representing the Water Sector in various DIA forums.

Gisborne Wastewater Treatment Plant Stage 2 Upgrade and Masterplan

Project Director for this \$35M project to add secondary clarification, tertiary filtration, and UV disinfection for the BTF effluent stream, and a biosolids storage, dewatering and loadout facility for the solids which are captured in the lamella clarifier. This will significantly increase the quality of the domestic waste stream, and the WWTP will recycle a portion of the final effluent for washdown and sparges, replacing the potable supply and saving \$250-300K per annum in water supply costs. The project included master planning the site for future treatment plant upgrades.

Napier Wastewater Treatment and Disposal Masterplan

Project Director for the preparation of a 30-year wastewater masterplan for Napier City whose population is predicted to grow from 60,000 to 90,000 over this time. It is predicted that effluent standards for the current ocean outfall will increase, and the existing plant will need to be upgraded, as well as expanded. The masterplan proposes that a new modular satellite plant be developed to service 20,000 population growth on the western hills, with an advanced membrane BNR to enable effluent reuse for irrigation or for sustaining environmental river flows in dry periods, likely to be more severe in Hawkes Bay with climate change. The masterplan proposes new inlet works (to replace the low seismic resilient existing headworks) and a new outfall and outfall pumping station to discharge 50% higher peak wet weather flows.

Kinloch Wastewater Treatment Plant Upgrade

Project Director for the upgrade of Taupo DC’s SBR plant at Kinloch to an advanced membrane bioreactor able to achieve very low levels of nitrogen and phosphorus to allow the effluent to be disposed of to land. The project was very difficult as the treatment plant is on a compact site and operation had to be maintained while the new process equipment was being installed. New plant included: coarse and fine inlet screens; grit traps; offline peak flow storage tanks; diffuser grids and mixers; aeration blowers; membrane system; and new switchboards and control system.

Te Awamutu Wastewater Treatment Plant Expansion

Project Director for the upgrade of this secondary treatment plant for Waipa DC to provide additional capacity and higher effluent quality to meet new consent requirements. The project provided challenges as the treatment plant operation had to be maintained while the new process equipment was being installed. New plant included: fine inlet screens; higher capacity lift pumps; screenings handling equipment; second circular secondary clarifier; UV disinfection; additional aeration mixers; and new switchboards and control system.

Pukekohe Wastewater Treatment Plant – Expansion and Upgrade from SBR to MBR

Project Director for this \$60M project for Watercare Services Ltd to double the Pukekohe WWTP capacity from 260L/s to 520L/s and to convert the current SBR process to an MBR process to achieve higher effluent quality standards. The project also includes completely new inlet works (5mm coarse and 1mm fine screens and vortex grit removal), new blower building, new control room, new solids handling (storage and screw-press dewatering) complex and a dewatered solids mono-fill created from an old wetland adjacent to the WWTP.



John Crawford

Beca Technical Fellow – Wastewater Engineering

Bachelor of Engineering (Hons)

CPEng, Fellow. ENZ

Chartered Eng (UK), MCIWEM

Certified Resource Consent Decision Maker (2008)

John's 38 years of experience has been gained in New Zealand, Singapore, the UK, Fiji and Malaysia. He is a nationally recognised expert in wastewater projects. He has specific interest in wastewater treatment and disposal / reuse projects, quantitative microbial risk assessment and biosolids management. He has extensive experience in the resource consent forum in research, consultation, the provision of expert witness, the drafting of consent conditions and is certified as a Commissioner / Decision Maker under the NZ Resource Management Act. John is regularly called upon to undertake external peer reviews and to facilitate HAZOP and Safety-In-Design workshops.

Key strength:

- Very strong process understanding and brings a very strong multi-disciplinary capability, being able to 'see and understand' across the entire design, which is particularly valuable for small to medium sized plants that will have limited Capital and Operational resources.
- Ability to work with clients, stakeholders, and legal counsel to achieve effective, innovative solutions that meet both client requirements and community need.
- Ably exercises leadership over related technical disciplines to ensure a sound and coherent case and solutions are provided.
- Ability to disseminate highly technical concepts and information into easily understood terms and communicate these with 'lay' people to assist them with their understanding of the issues at hand.
- Strong background in procurement and delivery of works via Design and Build contracting models.

Citizenship New Zealand

Technology Study Tours Ireland & Germany – Anaerobic digestion (2015)
USA – Very low TN Effluent technologies (2022)
North America – Biosolids & Biogas reuse (2023)

Relevant experience

Huntly WWTP, Waikato DC, 2024

Concept design for new 4MLD MBR plant with site redevelopment & future MABR options.

Pukete WWTP, Hamilton City Council, 2022-23

Technical Director for preliminary and detailed design project to deliver a new inlet works for the Pukete WWTP for a capacity of 4.8m³/s inflow rate and an SL4 level of seismic resilience. Progressing into future Master Planning for the long-term site development.

Waikato Metro Wastewater Detailed Business Case 2020-22

Treatment plants lead for the team that produced the detailed business case for the future wastewater servicing strategy for the Taupiri to Cambridge and Te Awamutu metro area to 2061 and beyond. Based around the Co-Governance structure of the Waikato River Authority and with Te Ture Whaimana as a guiding document, the DBC investigations considered options for centralised (2 WWTPs) vs decentralised (5 WWTPs) wastewater treatment and discharge. Mana whenua and Council stakeholders were involved from day 1 to assist with definition of the problems and development of potential solutions. The concepts developed are based on nutrient reduction to very low levels (e.g TN<4mg/l), membrane separation technology and advanced solids processing and energy recovery. The objectives are to give effect to the Vision & Strategy for the Waikato River, maximise resource recovery and minimise atmospheric emissions.

Project Pure Stage 2, Queenstown Lakes District Council, 2020-23

Technical lead for the Beca team engaged to undertake the Concept, Preliminary and Detailed designs for the Stage 2 expansion of the Wanaka WWTP to cater for significant growth in the catchment and the QLDC desire to centralise treatment where this makes sense from a business case perspective. Based on Batch Reactor technology with a significant focus on baselining and mitigating carbon emissions. First NZ use of the new, high efficiency Messner flat panel diffusers.

Project Shotover Stage 3, QLDC, 2018 – 2023

Engaged by Queenstown Lakes District Council to undertake project definition works that are required to inform the detailed design and construction phases for the Stage 3 upgrading of Shot-over WWTP. This includes flow and load characterisation, process selection, geotechnical and survey briefing and preparation of the Concept Design Report. Subsequently technical lead for the Beca team engaged to undertake the Concept, Preliminary and Detailed designs and construction technical & operational support.

Hamilton to Auckland Corridor Strategy, 2019

Wastewater expert guiding the 3-Waters considerations for the long term (10, 30 and 100 year) infrastructure development and coordination needs of the Waikato River Valley corridor between Cambridge and Papakura. This was undertaken in conjunction with central Government's other considerations for the corridor including transportation, housing and employment. Project was undertaken through 'Future Proof', an organisation consisting of senior representatives of mana whenua and the council organisations of the subject area.

Re-Imagining Mangere, Watercare, 2019-20

Direct appointment by Watercare to one of the teams planning the future process makeup of Watercare's flagship Mangere WWTP, serving approximately 1.1M people. My area is process conversion planning for the 12 no. primary sedimentation tanks in order to remove as much COD as possible for increasing biogas production.

Te Awamutu Wastewater Treatment Plant, Waipa District Council, 2018 – 2019-Imagining Mangere, Watercare, 2019-20

Technical lead for the development of the conceptual and preliminary designs, then technical lead for the detailed design for the Stage 3 BNR and disinfection upgrade. Facilitated the Stage 1 HAZOP and SiD workshops. Lead technical verifier for the project.

Project Shotover Stage 1, QLDC, 2013-2018

Undertook investigations and detailed design for, then subsequently supervised construction of a new inlet works for the Queenstown WWTP site. Provided advice on procurement, documentation (DBO under FIDIC Gold Book), process options, and public health risk for a new, tertiary level, wastewater treatment plant for Queenstown, Arrowtown, and Lake Hayes areas. Managed the procurement process with the client and a team of senior external consultants. Subsequently engaged as Employer's Representative during the design, build, and operations phases. The work has included preparation of the Employer's Requirements including detailed materials and performance specifications for all plant and equipment likely to be used in the new plant.



Garrett Hall

Technical Director - Environments

BSc (Physical Geography)

MSc (Hons) (Environmental Science and Chemistry)

PIEMA, CEnvP, Assoc. NZPI, MRMLA

Garrett is a Technical Director based in our Auckland office with over 23 years' experience. He has extensive leadership skills in long-term (35 year) resource consent infrastructure consenting projects.

Garrett has wide-ranging experience leading and co-ordinating teams responsible for the technical and planning investigations required for resource consent applications for coastal, water supply, wastewater, and transportation infrastructure. He has specialist knowledge and skills in water quality, contaminated land and environmental chemistry.

He has presented expert evidence at council hearings and the Environment Court. He is a Certified Environmental Practitioner (NZ), a Practitioner Member of the Institute of Environmental Management and Assessment (AIEMA), an Associate Member of the New Zealand Planning Institute and has completed the Independent Commissioner Training under the Ministry for the Environment's Making Good Decisions Programme.

Membership	<ul style="list-style-type: none"> • Member of the Resource Management Law Association (RMLA) • Practitioner Member of the Institute of Environmental Management and Assessment (PIEMA) • Certified Environmental Practitioner (CEnvP) • Associate Member of the New Zealand Planning Institute (Assoc.NZPI)
Special competence	<ul style="list-style-type: none"> • Technical leadership of resource consenting infrastructure projects • Environmental effects assessment • Contaminated land investigations • Water quality assessment • Management plan drafting • Resource consent preparation and co-ordination under the RMA, 1991
Background	<p>2018 to Present: Technical Director – Environments, Beca, Auckland</p> <p>2014 to 2018: Principal Environmental Consultant – Stantec New Zealand (formerly MWH)</p> <p>2008 to 2014: Senior Environmental Scientist – Stantec New Zealand Ltd (formerly MWH)</p> <p>2005 to 2008: Senior Environmental Consultant – Atkins Ltd (UK)</p> <p>2003 to 2005: Environmental Policy Planner – London Borough of Newham (UK)</p> <p>2000 to 2003: Environmental Reporting Team Leader – Northland Regional Council</p>

Relevant experience

Wastewater Monitoring, Upgrade and Technology Review Report (MUTR), Tauranga City Council, 2019.

Garrett was the Environmental Lead for the 2019 MUTR report and has first-hand experience preparing this report with a focus on compliance with consent conditions and reviewing the current sampling regime and the implications of legislative changes on the ongoing operation of the wastewater scheme.

Environmental Monitoring and Technology Review Report, Hamilton Wastewater Resource Consent, 2016 to 2017.

Garrett was responsible for reviewing and finalising the 2017 Environmental Monitoring and Technology Review Report for the Pukete Wastewater Treatment Plant (WWTP) discharge to the Waikato River. The review focussed on recent consent compliance, changes to relevant legislation since the granting of the consent in 2006 and reviewing changes to treatment process and wastewater disposal methods throughout New Zealand and their applicability to the Hamilton context. A key consideration of the report was whether the existing treatment and disposal process remains the Best Practicable Option (BPO).

Environmental Monitoring and Technology Review Report, Ruakaka/Marsden Point Wastewater Resource Consent, 2017 to 2018.

Garrett was responsible for the overall project management of the first Environmental Monitoring and Technology Review Report prepared for the Ruakaka/Marsden Point wastewater project since the resource consent was granted in 2011. The initial review focussed on extending the existing land disposal areas and possibly technologies/methods to further develop wastewater beneficial reuse options as part of the BPO. The report was used as the basis for consultation with mana whenua and provided to the Northland Regional Council to meet resource consent requirements.

Pukekohe Wastewater Treatment Plant Resource Consents, Watercare, 2014 to 2017.

As Project Manager and Project Technical Lead, co-coordinated the resource consents application and AEE's for discharges of contaminants to air, land and water from the Pukekohe WWTP. 35-year consents were granted in October 2017 after a Council hearing process where Garrett presented expert evidence on water quality effects of the discharge.

South-West Sub Regional Wastewater Servicing Project, Watercare, 2016 to 2018.

Provided specialist advice to assist with the assessment of alternatives process to determine the Best Practicable Option (BPO) for an integrated wastewater solution to serve the communities of Kingseat, Clarks Beach and Waiuku. 35-year consents were granted in December 2017 after a Council hearing process where evidence was presented on the assessment of alternatives process.

Far North District Council, Rawene Wastewater Working Group and Consent Project – 2022 – ongoing.

Garrett assisted FNDC recommence the engagement with the Rawene Wastewater Working Group (Te Mauri o Te Wai). Te Mauri o Te Wai have a strong preference for Electrocoagulation (EC) treatment, which is currently being assessed by FNDC, including the proposed EC trial at Taipa WWTP (see project below).

Far North District Council, Kaikohe Wastewater Treatment Plant Working Group, 2022 – ongoing.

Garrett is leading the technical engagement with the Kaikohekohe Wastewater Working Group to determine the long-term Best Practicable Option (BPO) for the treatment and discharge of wastewater from the Kaikohe township. Current work included identifying long-list treatment and discharge options (including land discharge) and treatment upgrade options. Garrett has a well-established working relationship with local hapu through this project. Current work includes assessing upgrade options to meet Infrastructure Acceleration Fund finding timeframes and development requirements.



Celia Walker

Senior Associate - Project manager- Three Waters

BSc (Hons) Environmental Science, HND Sewage Treatment and Sludge Disposal, PRINCE2 Project Management, Member of the Institution of Water and Environmental Management

Celia has 20 years experience in the public and private water sector within New Zealand and the UK. With a background in Environmental Science and Wastewater Treatment, Celia has specialist skills in planning and asset management for wastewater, water supply and stormwater infrastructure and is a strong project and programme manager. In recent years, Celia has worked for the Ministry for the Environment, Wellington Water and Tauranga City Council. Her role on this project: Project management and compilation of the Monitoring, Upgrade and Technology Review Report and facilitation of workshops.

With a background in Environmental Sciences and Wastewater Treatment, Celia has held a variety of project and programme management roles during her career in the Three Waters sector. Celia has good understanding of TCC's wastewater system and treatment plants through her work with TCC over the last 17 years. Celia previously worked for Tauranga City Council in the City Waters Team from 2006 to 2013, which included managing projects such as the Papamoa Comprehensive Stormwater Consent and working with iwi/hapu partners and presenting to the WWMRC on numerous occasions. In 2016 Celia was seconded into TCC as a Strategic Planner for the Environment, which included leading the development of Tauranga Taurikura, including external and internal engagement activities, and working with iwi/hapu partners. More recently, Celia Project Managed, and co-developed of the 30-year master plan for wastewater treatment infrastructure.

Qualifications	<ul style="list-style-type: none"> • Bachelor of Science (Hons) Environmental science • HND Sewage Treatment and sludge management • PRINCE2 Project Management
Citizenship	<ul style="list-style-type: none"> • New Zealand, UK
Membership	<ul style="list-style-type: none"> • MCIWEM
Special competence	<ul style="list-style-type: none"> • Wastewater Infrastructure Planning • Project management • Sustainability • Asset Management
Background	<p>2016 to Present: Senior Associate Project Manager, Beca Ltd</p> <p>2015 to 2016: Senior Analyst, Ministry for the Environment. Wellington</p> <p>2015 to 2016: Senior Project Manager/Team Leader, Wellington Water. Wellington</p> <p>2013 to 2016: Planning Engineer: Three Waters, Tauranga City Council</p> <p>2007 to 2013: Engineering Technologist: City Waters, Tauranga City Council</p> <p>2001 to 2007: Wastewater Management, Various Roles, Severn Trent Water Ltd, UK</p> <p>1999 to 2000: Environmental Projects Officer, Three Valleys Water Ltd, UK</p>

Relevant experience

Project and Programme management

Project Manager/Key Client Contact. Tauranga City Council. Climate Action and Investment Plan. July 2022-March 2023.

Project Manager and key client contact for preparation of the first draft Tauranga Climate Action and Investment Plan. Role included inputs into the stakeholder management plan, oversight and management of the project deliverables, programme, risks, people/resource management, client liaison and progress reporting. Beca deliverables included; undertaking basic emissions modelling, setting a science-based target for the city of tauranga and developing the first draft Climate Action Plan including working with Te Rangapu Representatives to develop a Te Ao Maori Framework for the plan, integrating Maori Values and Concepts.

Programme Manager. Hamilton City Council. Three Waters Resilience Study. March 2021 – June 2022

Programme Manager for a Three Waters Resilience Study with a project budget of \$600K with 14 work packages. Work improved understanding of their current state of resilience and scoped individual work packages to deliver some quick wins and develop tools for future use to improve the resilience of three waters activities. This included an implementation plan of future work. An adapted UN Resilience Scorecard was used to assess the current state of resilience and identify priority work packages for inclusion. Programme management responsibilities encompassed, scoping, budget and risk management, resource management, scheduling, deliverables co-ordination and reporting.

Strategic Planner for the Environment. Tauranga City Council. December 2016 – April 2018

Project lead for development of an Environment Strategy for Tauranga City, including external and internal engagement activities. Development of the work programme for the Environment Committee and providing strategic advice and support to elected members and staff. Relationship management with key environmental partners and stakeholders, including iwi/hapu and the Regional Council.

Three Waters Infrastructure Planning

Wastewater Management 30-year plan and updates, Tauranga City Council. 2020 – 2021

Project Manager, and co-developer of the 30-year master plan for wastewater treatment infrastructure. This included scoping infrastructure requirements, developing a programme and identifying interdependencies and preparing capital cost estimates. The role included running co-design workshops with key stakeholders, coordinating and managing inputs from subject matter experts and drafting the infrastructure plan document.

Wastewater Treatment Specific

NZ Wastewater Sector Overview Report, Ministry for the Environment. 2020-2021

The NZ Wastewater Sector Report was commissioned by the Ministry for the Environment and outlined current and emerging trends in the management of wastewater nationally. It was developed in collaboration with Beca, GHD and Boffa Miskell, including detailed information on trade waste management, environmental performance, land-based wastewater discharges and climate change. Role included job management and coordinating inputs from subject matter experts and leading the interface between the Beca team and other consultant collaborators to prepare a single document.

Asset Management – Asset Renewal Planning

Wastewater Asset Renewals Plans, Hamilton City Council – 2020

Assisted with the development of 30-year renewals plans for water supply assets (including water meter renewals programme) for Hamilton City Council. Role included Job Management, key client contact, methodology development and report preparation.



DR SHARON DE LUCA

KAIHAUROI | ECOLOGIST, PARTNER

SHARON.DELUCA@BOFFAMISKELL.CO.NZ | +64 7 571 5633

TOHU MĀTAURANGA | EDUCATION

Independent Hearings
Commissioner, Ministry for the
Environment, 2016

Doctor of Philosophy,
Environmental and Marine Science,
University of Auckland, 2000

Bachelor of Science, Zoology,
University of Auckland, 1995

NGĀ PUKENGA O MUA | EXPERIENCE

20+ Years Marine Ecology

14 Years Freshwater and
Terrestrial Ecology

TŪHONO MĀTANGA | AFFILIATIONS

Certified Environmental
Practitioner, Environment Institute
of Australia and NZ

Member, NZ Coastal Society

Member, Royal Society of NZ

NGĀ HAUTAKA | RECENT PUBLICATION RECORD

Hartland, A., Zitoun, R., Middag,
R., Sander, S., Laferriere, A.,
Saeed, H., De Luca, S., Ross, P.M.,
Aqueous copper bioavailability
linked to shipwreck contaminated
reef sediments. Scientific Reports.,
Article number 9573, 2019

De Luca, S., Mangroves in NZ –
misunderstandings and
management. 2015 Proceedings
of the Coasts and Ports
Conference, Auckland, 2016

NOHOANGA KA TIKI | SUITABILITY FOR THE ROLE

Sharon's approach is strongly based in ecological principles, coupled with a passion for ensuring technically robust and innovative environmental outcomes. Her ecological assessments and advice have the rigour to withstand scrutiny in Environment Court and Board of Inquiry Hearings where she has presented expert witness evidence for many significant projects.

She has advised a large range of clients from private landowners, district and regional councils to infrastructure/resource extraction companies, Government agencies and departments. Over recent years she has worked on a number of infrastructure projects including four Roads of National Significance with NZTA (where reclamation and discharges to the coastal environment were key issues), shipwreck abandonment, establishment of offshore oil infrastructure and mooring structures for cruise ships.

On large multi-disciplinary projects, she has integrated with hydrodynamic modellers, coastal processes scientists, erosion and sediment control specialists, stormwater treatment experts, engineers and other experts.

Sharon thrives on complex and challenging projects. She has significant experience in assessment of effects on coastal/marine, preparation of long-term monitoring programmes, habitat surveys, contaminant analyses, restoration plans and preparation and presentation of expert witness evidence. She has a strong background in the area of ecotoxicology, which was the subject of my Doctoral thesis and subsequent five years of research as a post-doctoral fellow in Hong Kong.

PUKENGA WHAKARITE | MANAGEMENT SKILLS

Experienced in managing disciplinary teams of up to 20 people on projects ranging from \$100,000.00 to \$600,000.00.

PUKENGA HANGARAU | TECHNICAL SKILLS

- Marine Ecology
- Assessment of Environmental Effects
- Environmental Monitoring
- Expert Witness
- Ecological / Scientific Advice
- Peer Review

MARINE ECOLOGIST, TRANSMISSION GULLY, NZTA AND SUBSEQUENTLY CPB, WELLINGTON, 2009 TO PRESENT:

Assessment of effects on marine receiving environment from construction phase discharges and operational phase stormwater on the Porirua Harbour from the Transmission Gully project. Presentation of evidence in Environment Court. Monitoring and analysing monitoring results on a 6 monthly, and more recently, 3 monthly basis.

MARINE ECOLOGIST, MARSDEN OIL REFINERY, WHANGAREI, 2019 TO 2020:

Assessment of effects on marine receiving environment from structures in the CMA and discharge of treated wastewater and stormwater. A critical part of the assessment is consideration of effects on adjacent marine reserve and other significant marine areas.

INDEPENDENT TECHNICAL ADVISORY GROUP MEMBER, RENA, THE ASTROLABE COMMUNITY TRUST, TAURANGA, 2018 TO PRESENT:

Independent review of marine ecological monitoring relating to the effect that the grounded vessel may continue to have on the ecological values of the Astrolabe Reef.

AQUATIC ECOLOGIST, STATE OF THE RECEIVING ENVIRONMENT, TAURANGA CITY COUNCIL, TAURANGA, 2010 TO PRESENT:

Assessment of the quality of the freshwater, estuarine and marine stormwater receiving environments in Tauranga City, involving survey of sediment and water quality, microbiological indicators, marine and freshwater invertebrates, and freshwater fish.

NGA WHIWHINGA | AWARDS

2015

NZPI Annual Awards - NZTA'S
Application for maintenance
discharges from Auckland Harbour
Bridge

MAHINGA O MUA | BACKGROUND

2020 to present

Partner, Boffa Miskell Ltd,
Tauranga

2006 - 2020

Associate Partner, Boffa Miskell
Ltd, Tauranga

2000 - 2005

Post-Doctoral Fellow, City
University of Hong Kong, Kowloon
Tong

1997

Part time consultant microbiological
surveys, Northland Regional
Council

INDEPENDENT HEARING COMMISSIONER AND EPA DMP HEARINGS

DECISION MAKING PANEL, EPA, 2022-ONGOING:

Reconsideration of EEZ application for iron sand mining in Taranaki.
Currently sitting on a DMP for the EPA.

INDEPENDENT HEARING COMMISSIONER, SAND MINING AT PAKIRI HEARING, AUCKLAND UNITARY COUNCIL, 2022:

Sat on hearing panel relating to the application for sand mining in nearshore and midshore zones at Pakiri Beach. Assisted with writing the decision.

INDEPENDENT HEARING COMMISSIONER, DREDGING OF THE APPROACH CHANNEL TO THE PORT OF AUCKLAND, AUCKLAND UNITARY COUNCIL, AUCKLAND, 2020:

Sat on hearing panel relating to the application for dredging to deepen the approach channel to the Port of Auckland to allow larger vessels to enter the Port. Assisted with writing the decision.

INDEPENDENT HEARING COMMISSIONER PANEL, HEALTHY WATERS, SHELLY BEACH ROAD AND MASEFIELD BEACH, AUCKLAND COUNCIL, AUCKLAND, 2019:

Sat on hearing panel relating to application for sewage network alterations. Assisted with writing the decision.

INDEPENDENT HEARING COMMISSIONER PANEL, ROYAL AUCKLAND AND GRANGE GOLF CLUB, AUCKLAND COUNCIL, AUCKLAND, 2018:

Sat on hearing panel relating to construction and operation of a two-lane bridge over the Tamaki Estuary to connect the two golf courses. Assisted with writing the decision.

EXPERT WITNESS

MARINE ECOLOGIST, STORMWATER CONSENT, PORT OF TAURANGA, TAURANGA, 2017-2019:

Preparation of Assessment of Effects on Marine Ecological Values and brief of evidence for Council hearing. Hearing in 2019. Decision favourable.

MARINE ECOLOGIST, QUEENS WHARF DOLPHINS, AUCKLAND TRANSPORT, 2018-2020:

Assessment of construction and operation of dolphin structures within the CMA to enable larger cruise ships to berth.

EXPERT MARINE ECOLOGY WITNESS, TAMARIND NEW ZEALAND LTD, 2018:

Provision of expert witness marine ecological evidence at an EEZ hearing relating to the deployment of temporary structures on the seabed within the Taranaki Oil field. Decision favourable.

EXPERT MARINE ECOLOGY WITNESS, SHELL OIL, 2017:

Provision of expert witness marine ecological evidence at an EEZ hearing relating to the deployment of additional structures on the seabed within the Taranaki Oil field. Decision favourable.

EXPERT MARINE ECOLOGY WITNESS, EAST WEST CONNECTION, NZTA, 2017:

Provision of expert witness marine ecological evidence at a Board of Inquiry hearing, where the primary

effects were reclamation of the Mangere Inlet foreshore and loss of coastal bird foraging habitat. Decision favourable.

EXPERT MARINE ECOLOGY WITNESS, RENA, SHIP INSURERS, 2017:

Provision of expert witness evidence at Environment Court hearing on marine ecology on behalf of the owners/insurers. Decision favourable.

EXPERT WITNESS, OKURA HOLDINGS, TODD PROPERTIES, 2015:

Provision of expert witness evidence regarding marine sediment contamination in a marine reserve arising from land-use change at Unitary Plan hearing on behalf of Todd Properties.

EXPERT MARINE ECOLOGY WITNESS, PRIVATE LANDOWNER, POINT WELLS, 2015:

Provision of expert witness evidence regarding marine ecology and sediment contamination arising from land-use change at Unitary Plan hearing on behalf of private developer. Decision favourable.

EXPERT MARINE ECOLOGY WITNESS, SHOAL BAY SPECIAL ECOLOGICAL AREAS, NZTA, 2015:

Provision of expert witness evidence on significant marine ecological values for Unitary Plan hearing on behalf of NZTA.

EXPERT WITNESS, MANGROVE MANAGEMENT PROVISIONS PROPOSED AUCKLAND UNITARY PLAN, 2015.

Provision of expert witness evidence on mangrove ecology for Unitary Plan hearing. Decision favourable.

EXPERT MARINE ECOLOGY, Puhoi to Warkworth, nzta, 2012-2014:

Assessment of the effects of construction and operation (including contaminant discharges) of new motorway alignment marine receiving environments. Expert evidence was presented at Board of Inquiry hearing in 2014. Decision favourable.

EXPERT MARINE ECOLOGY, PENLINK, AUCKLAND TRANSPORT, 2014.

Resource consent application was lodged in late 2014. Presented evidence at Council hearing on construction of a bridge within the Coastal Marine Area and discharges of contaminants to the marine environment and marine reserve. Decision favourable.

MARINE ECOLOGY EXPERT WITNESS, DRURY INDUSTRIAL DEVELOPMENT, AUCKLAND COUNCIL, 2014:


Expert estuarine ecology evidence addressing the discharge of contaminants was presented at Council hearing and a favourable decision was received.

EXPERT WITNESS, BAY OF PLENTY REGIONAL COASTAL POLICY STATEMENT APPEAL, BAY OF PLENTY REGIONAL COUNCIL 2013:

Preparation of expert marine ecological evidence regarding the proposed new policy around mangrove removal in the Bay of Plenty region. The court made a favourable decision.

PROJECT ROLE, WATERCARE CENTRAL INTERCEPTOR, WATERCARE, 2013.




Presentation of evidence at Council hearing on the effects of construction of wastewater infrastructure in the Coastal Marine Area and potential for contamination in the marine environment. Decision favourable.



Ka ora te wai
Ka ora te whenua
Ka ora te whenua
Ka ora te tangata

If the water is healthy
The land will be nourished
If the land is nourished
The people will be provided for

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 linkedin.com/company/beca
 twitter.com/becagroup
 facebook.com/BecaGroup

**make
everyday
better.**

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