Waikato Sub-Regional Three Waters

Strategic Business Case

A compelling case for change

Future Proof partners

December 2019

Contents

Figures

Tables

Appendices

Executive summary

Introduction

This Waikato Sub-Regional Three Waters Strategic Business Case sets out the case for change in municipal water, wastewater and stormwater management in the Waikato and Waipā River catchment[1]. Changes are needed because of:

- increasing freshwater water quality standards and the desire for Best for River environmental and social outcomes
- forecast population increases and changes in land use
- the need to deliver services more efficiently
- concerns around community affordability.

The strategic business case is part of the Sub-Regional Three Waters Project, which responds to *Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River*[2], Future Proof objectives, government policy changes in water standards and management, and local policy direction such as Healthy Rivers/Wai Ora: Proposed Waikato Regional Plan Change 1 – Waikato and Waipā river catchments.

It is intended to support development of a programme business case for a collaborative strategy and long-term investment in three waters management and delivery in the sub-region, unconstrained by territorial boundaries.

The focus of this business case is on three waters strategic infrastructure. But many of the potential solutions, utilising a collaborative and holistic approach, have relevance to, and will be influenced by, land use planning and development.

Strategic context

The Three Waters Project is being delivered through the Future Proof Partnership[3] and is one initiative being delivered as part of the broader *Hamilton to Auckland (H2A) Corridor Plan*. The study area includes parts of the Waikato and Wāipa districts and all of the Hamilton City Council jurisdiction. It is wholly within the Waikato Regional Council jurisdiction.

Provision of three waters infrastructure is a key enabler for sustainable development and growth in the H2A corridor and region. Three waters services are:

- fundamental to community wellbeing and the quality of the environment
- key to unlocking economic potential in the H2A corridor, including investment already made in the Waikato Expressway
- essential to achieving the growth and development objectives and aspirations of the H2A Corridor Plan and the Future Proof Strategy
- Key to demonstrating how urban land use and development is giving effect to Te Ture Whaimana which requires that development within the Waikato River catchment improves the quality of the environment.

The H2A corridor is nationally significant and work is well underway to develop an integrated spatial plan and establish an ongoing growth management partnership for the corridor. The spatial planning exercise is a key pillar of the Government's Urban Growth Agenda (UGA).

1 While the case for change is applicable to the full Waikato and Waipā river catchments, this business case and the broader Sub-Regional Three Waters Project that it supports are focused on the settlements located in the river catchments from Cambridge/Karāpiro and Te Awamutu/Kihikihi in the south through to Port Waikato. A map of the Waikato sub-region study area is in Figure 1 in section 1.1.

2 *Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River* is the primary direction setting document for the Waikato River and its catchments. It calls for an integrated, holistic and co-ordinated approach to the management of the natural, physical, cultural and historic resources of the Waikato River, and the restoration and protection of the health and wellbeing of the Waikato River. There are also significant expectations for swimming and fishing in the wider community.

3 Future Proof comprises representatives from Waikato Regional Council, Hamilton City Council, Waipā and Waikato district councils, Tainui Waka Alliance, Waikato-Tainui and Ngā Karu Atua o te Waka (a forum providing input on matters relevant to tangata whenua), NZ Transport Agency, Waikato DHB. For matters relating to the Hamilton to Auckland Corridor the membership also includes representatives from central government, Auckland Council, Tamaki Makaurau iwi, Franklin Local Board.

Currently Hamilton city, Waikato district, and Waipā district councils are individually responsible for three waters infrastructure and services in their respective communities. Along with land use modification, drainage and land use activities, decisions relating to this infrastructure and land development have contributed to a current state where:

- the water quality of the Waikato River is significantly degraded and does not meet current expectations or technical targets[4]
- in general, three waters infrastructure is inefficient and ageing, no longer fit-for-purpose, with a significant legacy of underinvestment
- there is uncertainty around the abilities of individual councils to fund infrastructure, maintenance and operations for future growth and to achieve regulatory targets for freshwater quality
- there is concern about whether or not, under existing funding arrangements, ratepayers will be able to afford appropriate three waters infrastructure in the future.

Future growth pressures, environmental expectations and increased regulatory requirements (such as *Te Ture Whaimana* and the National Policy Statement for Freshwater Management) are likely to exacerbate these issues.

Three phase development

The Waikato Sub-Regional Three Waters Project is being delivered in three phases. This strategic case is a key deliverable from phase 1.

This project has been developed and delivered through partnership and collaboration with iwi, local government and water service providers and central government agencies with interests in the study[5].

4 Targets include the National Policy Statement – Freshwater 2017, Proposed Waikato Regional Council Plan Change 1.

5 List of stakeholders sourced from the Waikato Sub-Regional Waters investigation – terms of reference final v1.3.

The need for investment

The challenges associated with the current approach to three waters servicing (and by default land use planning and development) are consolidated into four main areas.

1. **Lack of integrated management**
   There is a lack of integrated catchment management and urban waters long term planning. There is an absence of a common vision and agreed future outcomes that are unconstrained by territorial boundaries. Insufficient application of both mātauranga Māori and conventional science methods, and inadequate funding provisions, is resulting in inefficient near sighted decision making and the degraded health and wellbeing of the Waikato River.
2. **Historic decisions resulting in degraded environment and relationships**
   Inconsistent, short term and boundary driven regulatory, planning and investment decisions on land use and urban water resource management have contributed to cultural disconnect, degraded water quality, poor ecosystem health and over allocated resources. As a consequence, the relationships our communities have with the Waikato River and the ability of Waikato River iwi to exercise mana whakahaere or conduct their tikanga and kawa have been severely compromised.
3. **Poor infrastructure planning and inconsistent regulatory oversight**
   Reactive infrastructure planning practices, coupled with inadequate regulation and compliance and inconsistent management practices, standards and performance expectations, have led to a variable urban water system performance across the region. This has adversely impacted the health and wellbeing of the Waikato and Waipā rivers.
4. **Infrastructure investment deficit**
   There are significant affordability challenges, as well as maintenance, operational and resource (skill) capacity issues, in the sub-regional three waters space. These are driven by a legacy of underinvestment in urban water systems; infrastructure reaching end of life; increasing regulatory requirements and environmental expectations; climate change impacts and greater growth demands. Combined, this has created a significant investment deficit within the sector.

While local authorities have budgeted for significant investment in their three waters services in their 2018-2028 long term plans, the level of funding currently in place is unlikely to satisfy regulatory obligations, or adequately respond to current and future growth pressures and long term environmental expectations. As a result, valid concerns exist around the sustainability of local government funding and people's ability to pay.

There is an urgent need to re-evaluate, redesign and deploy urban water management solutions and delivery mechanisms that meet the objectives of *Te Ture Whaimana*, rise to the challenges facing communities, unlock economic potential and deliver environmental, cultural, social and economic benefits.

There is a strong case to investigate boundaryless and collaborative three waters planning, management and delivery approaches between the partner councils.

This approach signifies a step change in thinking about the way three waters infrastructure and services should be planned and managed in river catchment sub-regions throughout New Zealand. More importantly, it represents a desire from all three councils to do better, respond to changing requirements and investigate and potentially adopt sub-regional three waters approaches that are more affordable, and can achieve improved long term outcomes for the sub-region, the Waikato and Waipā rivers and the wellbeing of local communities.

Opportunities

Addressing the challenges outlined above will contribute toward the following outcomes and benefits[6].

1. Commitment to a collaborative and integrated approach to land, water and community planning that is holistic, integrated, aligned with community aspirations and provides opportunities for involvement by wider community.
2. Deliver Best for River solutions and approaches for managing growth and resource sustainability.
3. River health and quality will be enhanced and people's connection with the river will be restored.

Aligning this business case to give effect to and contribute towards achieving Te Ture Whaimana is critical. As such, the objectives of *Te Ture Whaimana* were used to develop a set of draft objective statements and key performance indicators. These draft objectives, plus the objectives of *Te Ture Whaimana*, will form the basis for identifying and assessing urban water management options for phase 2 of the project. Programme objective statements are:

1. The whole of river water quality is improved.
2. All life within the stream and surrounding environment benefit.
3. Communities understand and are committed to caring for and protecting the river.

6 The benefits were identified in the ILM workshop on 14th May 2019 and two Best for River definition stakeholder workshops conducted on 25th June and 5th September 2019

4. Cultural connectivity with the river is restored and enhanced.
5. Improve access to the Waikato River to better enable sporting, recreational and cultural opportunities.
6. All water and land resource policy, regulations and decision-making frameworks across the catchment are consistent and fully aligned to achieve *Te Ture Whaimana*, including RMA instruments and catchment-based management approaches.
7. All river and land management decisions are based on robust and comprehensive knowledge and understanding of the river system, including real time and long-term data, sites of significance, and social and cultural activities.
8. Achieve net improvement to the environment.
9. Increase the efficient use of resources and maximise resource recovery and contribution toward carbon neutrality and energy neutrality.
10. Apply and maintain best practice to all three waters management and infrastructure which allows for the sustainable future growth of the Waikato sub-region.

These draft objectives and key performance indicators will be confirmed during the development of a programme business case.

It is clear a sub-regional three waters approach will be critical to unlocking economic development and residential growth in the Waikato sub-region through integrated planning. The success of the *H2A corridor plan* relies on a sub-regional three waters approach.

Three specific opportunities have also been identified in this strategic case (however, there are many other specific examples that will be considered alongside these specific opportunities in phase 2):

- **Cambridge wastewater treatment plant (WWTP) upgrade:** An upgrade of the Cambridge WWTP will help meet Best for River objectives and service growth within the Cambridge catchment area, southern Hamilton area, and Hamilton Airport commercial and industrial property park, plus unlock greater residential development within Peacocke. Diverting flow from the south end of Hamilton away from the Pukete WWTP provides the potential to release capacity and extend the area serviced by Pukete (possibly to unserviced land in Te Kōwhai and other areas to the north of Hamilton) and provide for wet industry activities.
- **Wet industry:** There is a significant opportunity to proactively plan for wet industry activities within the sub-region and create an environment that encourages, enables and supports water use and reuse innovation through water recycling and reuse for non-potable activities. This could involve sharing sub-regional allocations of consented capacity takes from the Waikato River.
- **Development at Ohinewai.** A sub-regional approach offers the potential to unlock proposed industrial development at Ohinewai by enabling sub-regional infrastructure to support such developments while also accommodating planned residential growth (at both Te Kauwhata and Huntly).

Strategic responses and outcomes

Stakeholders recognise that a strongly collaborative approach across councils is critical to making the changes needed in order to realise opportunities identified. This work signals a paradigm shift in the approach to three waters management and supports the high growth forecast for the H2A corridor.

Project partners agree that achieving Best for River outcomes and infrastructure upgrade and capacity improvement aspirations will require collaborative three waters management, as opposed to planning driven by territorial boundaries.

The responses to be investigated further in phase 2 of the programme business case will include:

- collaborative planning – for three waters infrastructure investments
- collaborative procurement – for capital programmes and operational contracts
- RMA processes – to make the processes of preparing consents and ensuring compliance more efficient
- asset ownership vehicles – to manage or own and manage assets collectively
- sub-regional technical resourcing and service delivery – operational resources for managing three waters infrastructure and processes.

The potential wastewater servicing options and solutions for the *Hamilton-Waikato Spatial Plan* area, including Cambridge, will be investigated and progressed in parallel with the overall programme level detailed business case.

In addition, Future Proof partners recognise the potential to extend the coverage of any future collaborative arrangements over time to incorporate more of the Waikato and Waipā catchment.

Next steps

The Waikato Sub-Regional Three Waters Project seeks to identify the most innovative, responsive and timely infrastructure solutions, unconstrained by territorial boundaries, while creating better environmental outcomes, community benefits and overall efficiencies than can currently be achieved by individual territorial authorities.

This approach provides a platform for more integrated catchment planning, economies of scale, operational efficiencies, and adoption of new and emerging technologies. Any plan will need to consider maximising efficient water use, water quality improvement, ecological enhancement and carbon and energy neutrality.

Delivery of a programme level business case for three waters infrastructure across the Waikato Sub-Region is the key deliverable for Phase 2 of the project. The Programme Business Case will map a long list of options and identify a short list of options for further detailed investigation. The Programme Business Case will identify key asset and non-asset based projects and activities needed to achieve the programme vision and objectives.

Phase 2 of the project will continue to be developed and delivered through collaborative decision making and collective endorsement of approaches taken and deliverables by the project partners. Phase 2 will also include broader stakeholder engagement.

Funding for phase 2 will be sought from Future Proof partners, central government and other key stakeholders. A funding application to central government to support phase 2 is currently being progressed. The project has been advised that any funding support from central government will be subject to the same level of funding support being forthcoming from partner councils.

1. Introduction

"Access to water and sanitation is a precondition to life and a declared human right. Water is vitally important to sustainable development – from health and nutrition, to gender equity and economics. Over the coming years, our water related challenges will become more urgent. The increasing demands of a growing population and rapidly developing global economy, combined with the effects of climate change, will exacerbate lack of access to water and sanitation for domestic uses. In fact, many experts argue that an unpredictable supply of water could constrain socio-economic progress in the future." United Nations (2018)[7]

The pressures on our water resources are evident globally, nationally and locally. They manifest in many ways, from degraded environmental quality and loss of biodiversity through to constraints on water allocation.

In New Zealand, local authorities, iwi, communities and industry face significant challenges in meeting their current and future three waters[8] service needs. In the Waikato, there are few fully compliant municipal wastewater treatment plants and the majority of municipal wastewater discharge consents will expire in the next 10 years.

The Waikato River is almost fully allocated as a water source during summer low flow conditions and it is clear we are not making best use of this precious resource. The impact of urban stormwater and drainage discharges on our waterways is acknowledged and needs solutions. These challenges are compounded by ever increasing growth pressures and the associated demands this places on the environment, including our waterways.

Many Waikato communities require urgent investment in their three waters infrastructure to address existing and future performance requirements and needs. Councils are under increasing pressure to provide new and enhanced infrastructure that progress toward achieving *Te Ture Whaimana* and the objectives set out in the National Policy Statement for Freshwater Management (NPS FM), deliver on community expectations for environmental quality, respond to growth pressures and unlock the economic potential of their communities.

While local authorities have budgeted for significant investment in their three waters services in their 2018-2028 long term plans, the level of funding currently in place is unlikely to satisfy regulatory obligations, or adequately respond to current and future growth pressures and long-term environmental expectations. As a result, valid concerns exist around the sustainability of local government funding and people's ability to pay.

The *Hamilton to Auckland Corridor Plan* is a platform for integrated and holistic spatial planning and development informed by proactive three waters infrastructure planning and investment. Addressing three waters challenges in the sub-region is key to unlocking the H2A corridor and supporting significant investments, such as the Waikato Expressway, already made in the region.

This project seeks to identify the most innovative, responsive and timely infrastructure solutions which are unconstrained by territorial boundaries and deliver greater outcomes, community benefits and overall efficiencies than individual local authorities can provide alone. A sub-regional approach will be essential to achieving economies of scale, supporting the adoption of new and emerging technologies, and securing a future state of water and overall environmental gains that individual local authorities will struggle to realise alone.

Benefits include optimised financial investment, more integrated planning to meet current and future needs, more efficient resource use (including water, energy, carbon and nutrients), water quality improvement and ecological enhancement.

1.1 Approach

The Waikato Sub-Regional Three Waters Project seeks to develop an evidence-based investment strategy with candidate projects for implementation. Investment decisions needed to implement the strategy require robust investment proposals and appropriate levels of evidence to support them.

The five case Better Business Cases model (BBC)[9] has been adopted to facilitate favourable investment decisions necessary for project success and to ultimately support implementation of the investment strategy. The BBC model provides a disciplined, step by step approach to ensure the key aspects of a robust investment proposal are explicitly and systematically addressed (NZ Treasury, 2018). The five cases (shown in figure 1 over page) are addressed within the business case development process.

7 https://undocs.org/A/RES/68/157

8 Three waters services refer to the collective provision of drinking water, wastewater and stormwater services.

9 This model is used by NZ Treasury and by NZTA to support their investment decision making and provides a systematic way to prepare business cases designed around the five-case model.

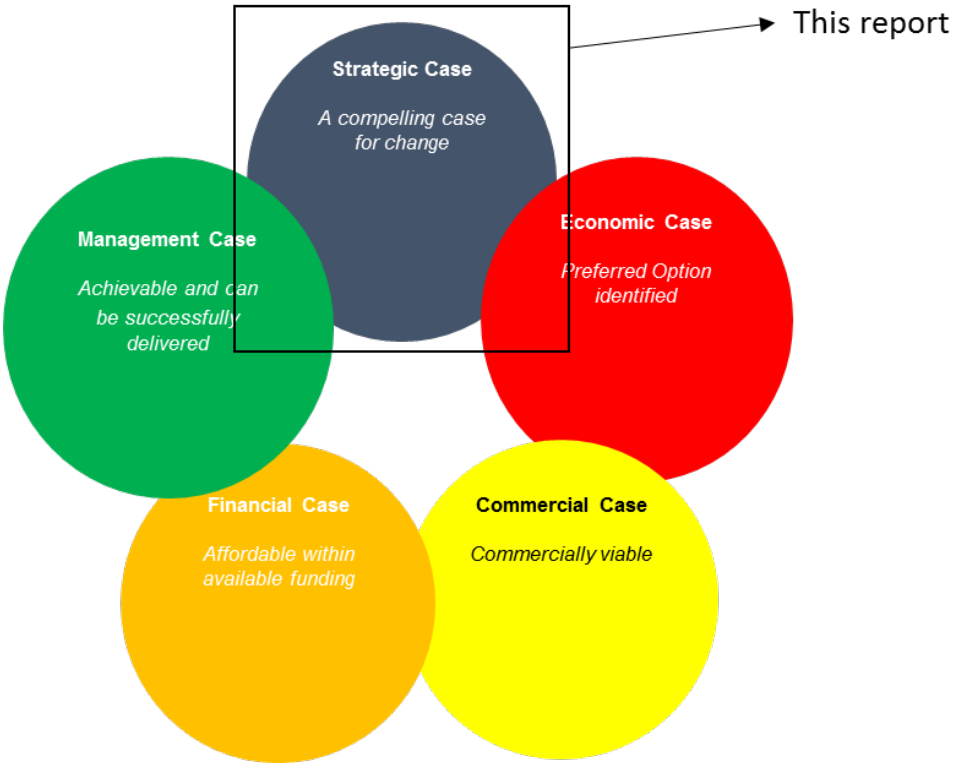


Figure 1 - The five cases of the Better Business Cases model (NZ Treasury, 2018)

This strategic case (phase 1) outlines the context and case for change in the way that water, wastewater, and stormwater (three waters) services are planned, managed and delivered in the Waikato and Waipā river catchments from Te Awamutu/Kihikihi and Karāpiro/Cambridge in the south through the Te Puaha o Waikato (Port Waikato) (herein referred to as the "study area"). It presents a shared understanding among project partners of the scale and significance of the problems, challenges and opportunities associated with current three water servicing in the study area. This is reinforced by the outcomes sought and the benefits desired in addressing the identified problems and challenges while capitalising on the opportunities presented. It also identifies potential strategic responses to address the problems.

This strategic case also provides the "case for change" evidence to support the completion of a programme business case (phase 2 of this project) that investigates collaborative sub-regional three waters management and delivery approaches, where greater service delivery effectiveness and Best for River outcomes can be achieved. The programme business case will develop the remaining four cases of the Better Business Cases model (the economic, financial, commercial and management cases) shown in figure 1.

Best for River is the concept that land and water management decisions, including those relating to three waters servicing, should be informed by and give effect to *Te Ture Whaimana o te Awa o Waikato* and *Te Mana o te Awa*[10]. This approach recognises that the management of water resources within the study area is directed both by national policy (in particular the National Policy Statement for Freshwater Management), and direction resulting from treaty settlements (in particular *Te Ture Whaimana*). Where there is a conflict, *Te Ture Whaimana* takes precedent[11].

This approach also recognises that existing and future development activities with potential impacts on the health of the river and its catchments, such as urban and industrial growth and development, are required to demonstrate that they will result in an overall improvement in the health of the Waikato and Waipā rivers[12].

This strategic business case should be read in conjunction with the *Waikato Sub-regional Three Waters Current State Technical Report* which provides further detail about the current state of three waters infrastructure and water quality in the Waikato sub-region.

10 Te Mana o te Awa is one of the guiding principles set out in the Waikato Raupatu River Settlement Act 2010.

11 According to the Waikato Regional Policy Statement, Section 12. Retrieved, 29 Oct 2019, from https://www.waikatoregion.govt.nz/Council/Policy-and-plans/Regional-Policy-Statement/Regional-Policy-Statement-Review/Section32/2/2-3/

12 WRC, 2019 (Internal Memo: Waikato River – Capacity for Urban Growth)

1.2 Scope

The project is being delivered through the Future Proof partnership[13] under the direction of the Water Policy Committee and is one of a number of initiatives being delivered as part of the *Hamilton to Auckland Corridor Plan.*

The project focuses on the development, delivery and management of the municipal three waters (water, stormwater and wastewater) infrastructure for urban settlements (current and future) in the study area shown in Figure 3 below. The study area is the Waikato and Waipā river catchment areas located in the Hamilton, Waikato and Waipā council areas[14]. The Waikato three waters sub-regional study area as shown in figure 2 is consistent with the land use development areas associated with the Future Proof partnership.

The project excludes flood management and rural land use and drainage systems except where there is a clear interface with the urban systems.

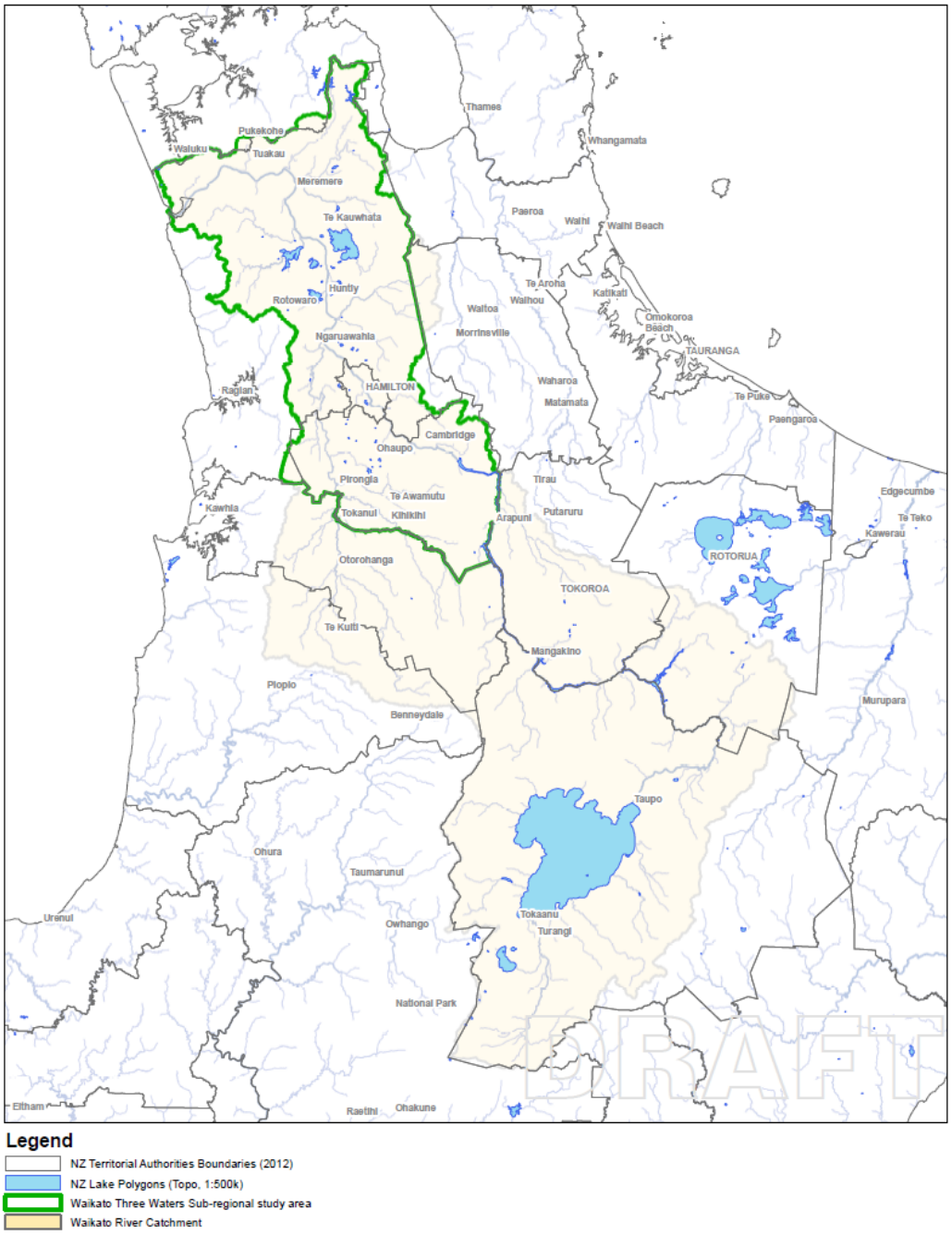


Figure 2 - Waikato three waters sub-regional study area[15]

13 Future Proof comprises representatives from Waikato Regional Council, Hamilton City Council, Waipā and Waikato district councils, Tainui Waka Alliance, Waikato-Tainui and Ngā Karu Atua o te Waka (a forum providing input on matters relevant to tangata whenua). For matters relating to the Hamilton to Auckland Corridor, the membership is expanded to include central government, the Auckland Council and three iwi representatives from Tamaki Makaurau.

14 It also considers adjacent settlements where appropriate such as Tauwhare which sits outside of the Waikato River catchment.

15 Source: Future Proof partners Waikato Sub-regional Three Waters Study, figure 1 Waikato River catchment, 22 August 2019

Ten, 30 and 100 year planning horizons have been adopted for the project. These horizons align with local government long term (10 year) planning processes, Future Proof population forecasts and the 80 year timeframe proposed to achieve the water quality targets set out in *Healthy Rivers/Wai Ora: Proposed Waikato Regional Plan Change 1 – Waikato and Waipā river catchments*[16]. It also recognises the long term nature of investments typically made in three waters infrastructure and the likely need to transition from existing systems and approaches to longer term solutions which are capable of meeting current and future needs.

Management of the three waters services and the land development activities that the services provide for are inextricably linked to the health and wellbeing of the river[17]. This strategic case adopts a holistic approach of what is Best for River and includes environmental, social, cultural and economic objectives. An integrated holistic approach to land and water management planning along with the potential to achieve three waters servicing synergies and greater delivery efficiency are key project drivers.

A key strategy contributing to development of this sub-regional strategic case is the *Future Proof Three Waters Strategy* developed by Future Proof partners in 2012. This strategy provides guidance on how water, wastewater and stormwater will be managed over a 50 year period. It calls for

the delivery of integrated, sustainable and well managed three waters services for the sub-region which ensures the cultural, social and economic needs of the community are met and the quality of the Waikato River is improved[18].

1.3 Hamilton to Auckland Corridor Plan

The *Hamilton to Auckland Corridor Plan* is a nationally significant joint Crown-council-iwi partnership which is developing a Statement of Shared Spatial Intent for the corridor. This in turn forms a framework for the development of the River Communities and the Hamilton-Waikato spatial plans. The spatial planning exercise is a key pillar of the Government's Urban Growth Agenda (UGA) to improve housing affordability, underpinned by affordable urban land. The *Hamilton to Auckland Corridor Plan* has six key focus areas.

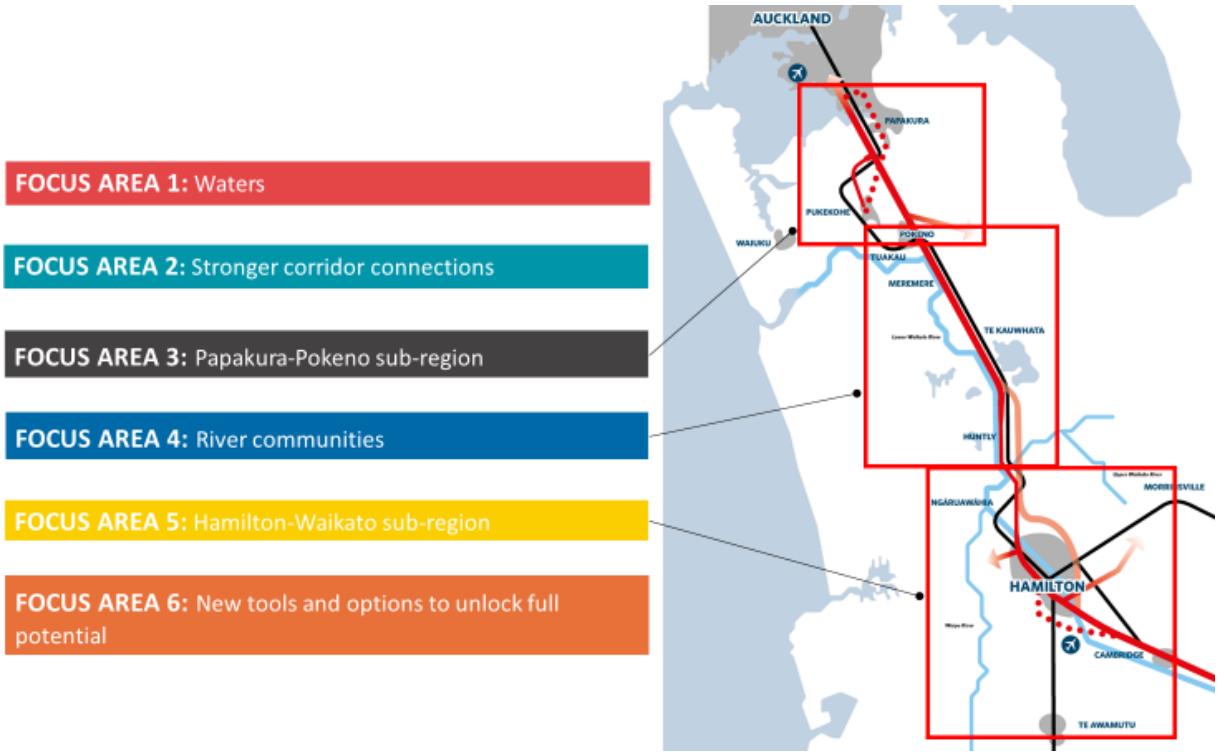


Figure 3 - Hamilton to Auckland Corridor Plan focus areas

16 Healthy Rivers/Wai Ora: Proposed Waikato Regional Plan Change 1 seeks to reduce the contaminant load entering into the Waikato and Waipā river catchments to achieve Te Ture Whaimana o Te Awa o Waikato – the Vision and Strategy for the Waikato River of making the river swimmable and viable for food collection along the entire length of the river

17 All urban settlements in the study area with municipal water services rely on the Waikato River for those services. In many instances water supply is drawn from surface or groundwater sources that feed the Waikato River. Wastewater discharges are either directly into the Waikato or Waipā rivers or tributaries draining to the river. Stormwater and drainage waters ultimately drain into the Waikato and Waipā rivers either directly or via lakes, wetlands and tributaries..

18 Future Proof partners, 2019. Three Waters Strategy. Retrieved 29 August 2019, from http://www.futureproof.org.nz/the-strategy/three waters-strategy/

The waters focus area cuts across the entire corridor and is made up of two key work streams:

- three waters
- land drainage and flood management.

Provision of adequate three waters infrastructure is a key enabler for sustainable development and growth in the Hamilton to Auckland Corridor and in the region, as these services:

- are fundamental to community wellbeing and the quality of the environment
- unlock the economic potential of the corridor, including the investment already made in the Waikato Expressway
- are essential to delivering the growth and development objectives and aspirations of the *Hamilton to Auckland Corridor Plan*
- represent major infrastructure investment across the region and present significant opportunity to maximise and deliver greatest value for investment
- are key to demonstrating how urban land use and development is giving effect to *Te Ture Whaimana* which requires that development within the Waikato River catchment improves the quality of the environment.

Land and water management decisions are inextricably linked and restoring the health and wellbeing of the river (which includes our lakes and wetlands) requires truly integrated water, land use and transport planning. To this end, the water focus area work stream is being delivered in conjunction with the other corridor plan focus areas. This will collectively help contribute toward achieving the *Te Ture Whaimana*, while delivering the *Hamilton to Auckland Corridor Plan* growth management objectives.

1.4 Existing three waters investment strategies and projects

Hamilton City Council, Waipā District Council and Waikato District Council have more than $1.1 billion budgeted over the next 10 years for three waters programmes[19]. Around 50 per cent of the total budgeted allowance is allocated for wastewater, 30 per cent for water supply and 20 per cent for stormwater.

Funded projects include:

- a new water treatment plant at Parallel Road, Cambridge, and connecting bulk mains to supplement the Te Awamutu water demand
- significant water treatment plant upgrades including Te Kauwhata and Waiora (Hamilton) and network investments including creation of demand management zones, new reservoirs, bulk mains and pumping systems
- major wastewater treatment plant upgrades, including at Te Kauwhata, Huntly, Pukete (Hamilton), Cambridge and Te Awamutu (Te Kauwhata and Cambridge are particularly significant given the ongoing noncompliance of those plants and the need for urgent investment decisions to be made to service growth)
- significant wastewater network capacity upgrades involving a combination of network storage, interceptors, pipe upgrades and catchment diversions to reduce overflows and provide capacity for infill (mostly residential)
- significant investment in stormwater systems needed to unlock greenfield development areas (such as Cambridge North, C1, C2 and C3 areas in Cambridge)
- funding to support stormwater consent compliance and integrated catchment management planning (Hamilton)
- an erosion control and remediation programme to address the impacts of urbanisation on receiving waterways (Hamilton).

Some examples of the funded projects are included in the table over the page. The list excludes trunk infrastructure required to service greenfield development areas.

19 This is the total amount funded in the Waikato, Waipā and Hamilton 2018-28 long term plans (excluding funding specifically allocated for Raglan) for water, wastewater and stormwater capital expenditure.

Table 1 - Example – three waters investment projects programmed in 2018-2028 long term plans[20]

Water supply	$ (with inflation)	Timing	Comments
Pokeno reservoir	$4m	2021-2028	Provide additional reservoir capacity to service residential growth.
Te Kauwhata , WTP upgrade, reservoir and pipe updates	$16m (also covers reservoir and pipework)	2020-2021	Stage 1 upgrade to 4500m3/day capacity. Provide additional reservoir and trunk main capacity to service residential growth.
Hamilton Waiora, WTP upgrade	$29m	2018-2028	Additional capacity to meet existing demand and short term needs.
Hamilton, network projects	$33m	2018-2028	Set up demand management areas. Excludes trunk mains and reservoirs to service new growth areas.
Te Awamutu Supplementary Water Supply	$34m	2019 - 2021	This is a programme of work to supplement the existing Te Awamutu Water Supply with additional water from the Waikato River. The programme includes projects to upgrade the intake pipeline from the Waikato River at Pukerimu to the Parallel Road WTP, increase the capacity of the Parallel Road WTP and transfer treated water from the WTP to Taylors Hill in Te Awamutu.
Cambridge, Alpha Street, WTP upgrade	$3m	2026-2028	Upgrade for further capacity.
Cambridge growth projects (new pump stations and pipelines)	$18m	2018-2028	Service residential and industrial areas.
Total water supply	**$137m**		

20 Note that this is not a complete list.

Wastewater management	$ (with inflation)	Timing	Comments
Pokeno,Tūākau, WW network capacity upgrades	$2m	2019-2022	Residential and industrial growth, pump station and rising main upgrades required and new gravity main in Tūākau.
Pukekohe, WWTP upgrade	$60m	2019	Growth and level of service. SBR to MBR + UV. Note: the Pukekohe WWTP serves parts of Waikato DC but also the south Auckland Council area.
Meremere, WWTP upgrade	$4M	2020	Level of service. Pond to MBR (differs from LTP preferred option of pumping to Pokeno). Pond to be retained for wet weather peak flows.
Te Kauwhata, short term upgrade	$4m	2020	Growth and level of service. Supplementary process being investigated to provide additional capacity until new MBR WWTP implemented.
Te Kauwhata, WWTP upgrade	$37m	pre 2028	Growth and level of service. Ponds to MBR with discharge to Waikato River via pipeline to Rangiriri.
Hamilton Pukete, WWTP	$20m	2019	Growth and level of service. No change. Primary + AS + UV.
Hamilton Pukete, WWTP inlet works and sludge upgrade	$15m + $16m	2022	Growth and level of service
Hamilton, network capacity improvements	$110m	2018-2028	A combination of network storage, interceptors, pipe upgrades and catchment diversions are planned to reduce overflows and provide capacity for infill (mostly residential).
Hamilton Peacocke, pump station and rising main	$65m	2021-22	Twin rising mains. 375mm and 600mm diameter – staged. Opportunities to service additional SW & SE sub-catchments.
Hamilton, growth extensions	$4m	2018-28	Rototuna, Rotokauri and Ruakura, Te Rapa North – residential and commercial.
Cambridge, WWTP short term upgrade	$5m	2019	Level of service. Aerated lagoon enhancements + UV + chemical P removal.
Cambridge, growth cell servicing	$5m	2018-2028	Cambridge growth cells C1, 2, 3 (residential) require additional trunk infrastructure to connect to the existing network. Pump stations and rising mains are most likely solution.
Hautapu industrial, WW servicing	$7m	2018-2023	A rising main is under construction to connect the existing Hautapu industrial area to the Cambridge WW network and service industrial growth cells in the area.
Cambridge, new WWTP	$27m	2024	Growth and level of service. Aerated lagoon to AS + UV.
Te Awamutu, WWTP stage 3 upgrade	$9m	2019	Growth. 2nd clarifier + additional aeration + new UV.
Total wastewater management	**$390m**		

Stormwater capital projects	$ (with inflation)	Timing	Comments
Hamilton, replacement of stormwater assets	$7m	2018-2028	Network renewals.
Hamilton, comprehensive stormwater consent implementation	$3m	2018-2028	
Hamilton, erosion control works	$38m	2018-2028	
Hamilton Rototuna, stormwater	$14m	2018-2021	
Rotokauri, stormwater	$41m	2018-2028	Partial funding of strategic stormwater needed to unlock growth cell.
Peacocke, stormwater	$69m	2018-2028	Strategic infrastructure to unlock growth cell. Funded over three stages.
Hamilton, stormwater pipe upgrade – growth	$2m	2018-2028	Funding to upsize infrastructure built by third parties as part of greenfield development.
Hamilton, existing network improvements in new areas	$1m	2018-2028	
Hamilton, integrated catchment management plan	$9m	2018-2028	Development of integrated catchment plans
Hautapu industrial, stormwater	$7m	2018-2023	Strategic infrastructure to unlock growth cell.
Cambridge north, residential stormwater	$16m	2018-2022	Strategic infrastructure to unlock growth cell.
Cambridge, C1, C2, C3 growth cells	$68m	2018-2026	Strategic infrastructure to unlock growth cells.
Waipā Cambridge Park, Bond Road, Kihikihi, stormwater	$1m		Minor improvement works.
Waipā, consent, remedial and flood mitigation work	$1m		
Waikato district, stormwater treatment improvements	$4m		
Waikato district, stormwater reticulation extensions	$4m		
Waikato district, stormwater reticulation upgrades	$5m		
Total stormwater capital projects	**$290m**		

1.5 Project collaboration

Working collaboratively across councils is critical to the success of this project. One of the key project objectives is "being an exemplar of collaboration and delivering a strategy that is supported by all partners".

Since the inception of this project in September 2018, key aspects and findings have been developed, discussed and agreed by the project partners before progressing to the next stages. This is particularly important given:

- the different local government boundaries and tribal territories that the study area covers
- the financial investment this project is ultimately seeking to inform
- the service delivery methods that may be needed to implement the investment strategies.

1.5.1 Project partners

Phase 1 of this project is sponsored by the Future Proof partners (Hamilton City Council, Waikato District Council, Waipā District Council and Waikato Regional Council) and Watercare (as a significant user of the Waikato River and provider of water and wastewater services in the study area).

External consultants providing technical support are engaged and managed through the Waikato Local Authority Shared Services (WLASS) company. WLASS is collaboratively owned by 12 councils in the Waikato and was established in 2005 to promote shared services and efficiency improvements between local authorities across the Waikato region[21].

Project partners, who have already contributed to the project, have an interest in the expected outcomes or can influence the investment proposal are identified in table 2[22]:

Table 2 - Key partners – Waikato Sub-regional Three Waters Project partners

Tangata and mana whenua with an interest in the sub-region spanning from Te Awamutu/Kemureti (Cambridge) through to Te Puaha o Waikato (Port Waikato)	
Waikato Tainui through Te Whakakitenga o Waikato	Raukawa Charitable Trust
Maniapoto Maori Trust Board	Tainui Waka Alliance
Ngā Karu Atua o te Waka (tangata whenua advisory board to Future Proof)	
Local government	
Hamilton City Council	Waikato District Council
Waipā District Council	Waikato Regional Council
Central government	
Department of Internal Affairs	Treasury
Ministry of Housing and Urban Development	Ministry for the Environment
Other	
The Future Proof partnership	Watercare Services Ltd

The project has been developed alongside and with input from the *Hamilton-Waikato Spatial Plan* and *River Communities Spatial Plan* focus area leads.

21 WLASS, 2019. Waikato Local Authority Shared Services Limited, About Us. Retrieved 24 September 2019, from https://waikatolass.co.nz/about-us/

22 List of stakeholders sourced from the Waikato Sub-Regional Waters investigation – terms of reference draft rev1.2

1.5.2 Phase 1 development process

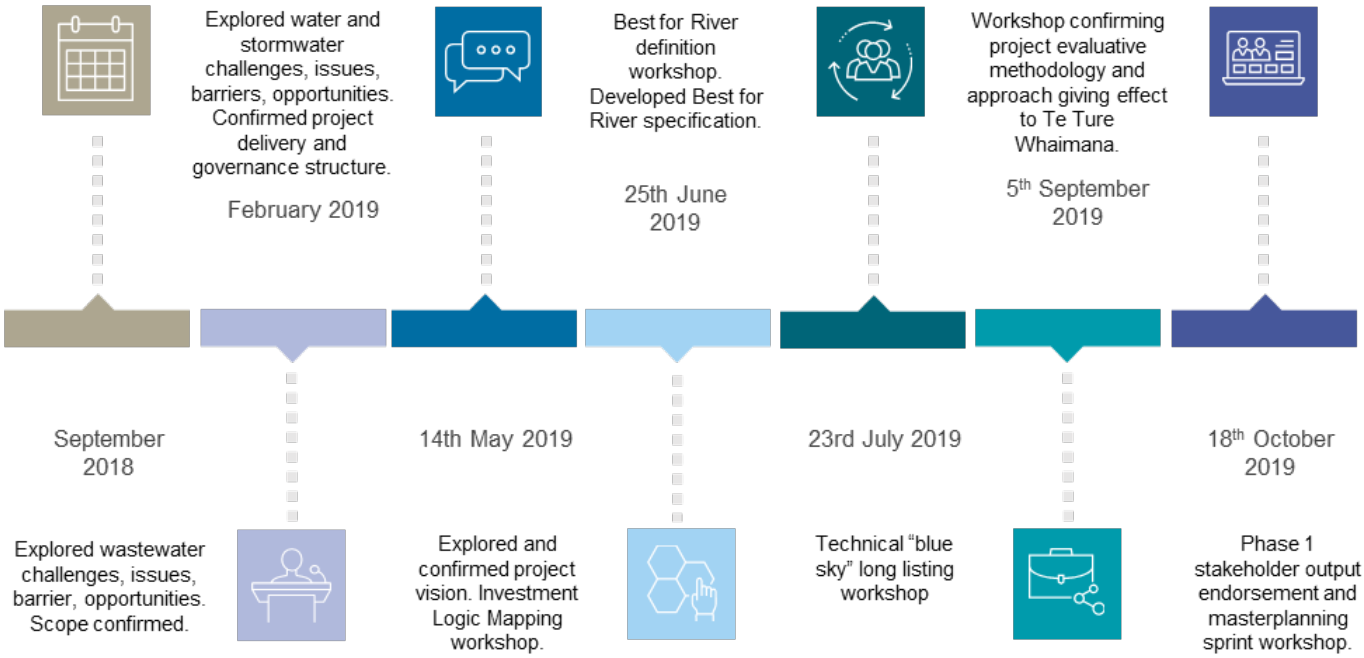
Phase 1 has been delivered through collaborative decision making and collective endorsement of approaches and deliverables (before proceeding further). Key project decisions made as a collective include:

- the scope of the study, including the study area; inclusion of water, wastewater and stormwater infrastructure; 10, 30 and 100-year design horizons
- the terms of reference
- the project vision and objectives
- investment logic mapping and key problem statements that the project is looking to address
- the methodology to be used to identify and evaluate servicing options and solutions.

Key stakeholders within respective partner organisations (from governance through to operation teams) have been regularly updated throughout phase 1, and input sought. Hapū and mana whenua representative groups have been informed of the phase 1 work and primed for direct involvement in phase 2 of the project and beyond.

The project has maintained open lines of communication between the project team and project partners. Continued high levels of partner and key stakeholder engagement is planned for the next phases. A timeline detailing the collaborative stakeholder workshops used to develop this strategic business case are shown in figure 4.

Figure 4 - Timeline of collaborative stakeholder workshops in the development of the strategic case



2. Strategic context

The strategic context provides an overview of:

- alignment to existing strategies
- stakeholder organisations and the outcomes they are seeking to achieve, or contribute to, through their activities
- current state in terms of water quality
- three waters infrastructure costs
- future growth projections.

2.1 Alignment to existing strategies

National and regional policies, plans and strategies relevant to this three waters sub-regional strategic business case are shown in figure 5 below. High level commentary on the relevance of policies, plans and strategies to this project is included in Appendix C.

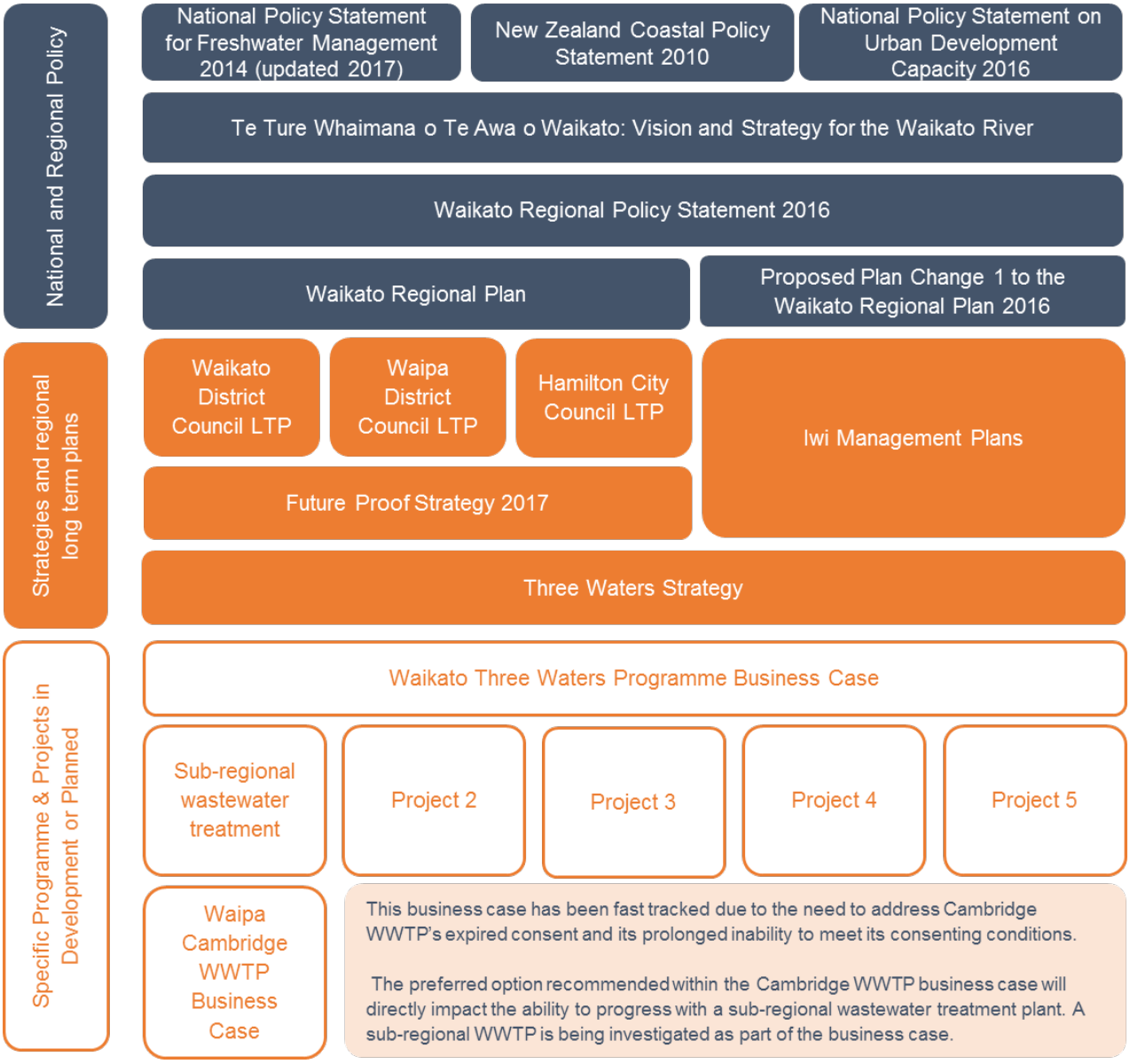


Figure 5 - Existing strategies tree diagram

Key strategies that outline the collective vision, regional plan and targets for Waikato River water quality are detailed below. In addition to the documents outlined in this section, local authorities have prepared strategic servicing documents for three waters services for all or part of their districts.

In some cases, local authorities have also partnered to look at strategic servicing across boundaries. These documents range from district wide master plans through to specific cross boundary water and wastewater servicing opportunities and have typically been used to inform 10 year and 30 year infrastructure strategies. The most relevant documents and strategies are summarised in the *Current State Report*.

2.1.1 Te Ture Whaimana o Te Awa o Waikato – Vision and Strategy for the Waikato River

Te Ture Whaimana is the primary direction setting document for the Waikato and Waipā rivers and their catchments. It was initially given statutory recognition via two Waikato River legislations in 2010, and subsequently extended to incorporate the upper Waipā River through the Waipā River legislation in 2012. *Te Ture Whaimana* was included in its entirety in schedule 2 of the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010. *Te Ture Whaimana* is also included in its entirety in the *Waikato Regional Policy Statement* (RPS), and regional and district plans must give effect to it.

Importantly, if there is any inconsistent provision in any RMA planning document, including any national policy statement, the Vision and Strategy prevails (Waikato Regional Council, 2019).

The *Vision and Strategy* contains the vision, objectives and strategies that reflect community aspirations and expectations.

The vision is:

Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri

The river of life, each curve more beautiful than the last

Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.

Te Ture Whaimana applies to the Waikato and Waipā rivers and to activities in the catchments of these rivers. It takes a holistic approach and aims for the restoration and protection of the economic, social, cultural and spiritual relationships that Waikato and Waipā river iwi and the Waikato region's communities have with the Waikato and Waipā rivers. *Te Ture Whaimana* prevails over the NPS-FM when there are any inconsistencies and requires more stringent water quality conditions to be met.

It requires the Waikato River to be safe for people to swim in and safe to take food from over its entire length (Waikato Regional Council, 2019).

Te Ture Whaimana includes 13 objectives.

a. The restoration and protection of the health and wellbeing of the Waikato River.
b. The restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural and spiritual relationships.
c. The restoration and protection of the relationship of Waikato River iwi, according to their tikanga and kawa, with the Waikato River, including their economic, social, cultural and spiritual relationships.
d. The restoration and protection of the relationship of the Waikato region's communities with the Waikato River including their economic, social, cultural and spiritual relationships.
e. The integrated, holistic and coordinated approach to management of the natural, physical, cultural and historic resources of the Waikato River.
f. The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River, in particular those effects that threaten serious or irreversible damage to the Waikato River.
g. The recognition and avoidance of adverse cumulative effects and potential cumulative effects of activities undertaken both on the Waikato River and within its catchments on the health and wellbeing of the Waikato River.
h. The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities.
i. The protection and enhancement of significant sites, fisheries, flora and fauna.
j. The recognition that the strategic importance of the Waikato River to New Zealand's social, cultural, environmental and economic wellbeing is subject to the restoration and protection of the health and wellbeing of the Waikato River.

k. The restoration of water quality within the Waikato River so that it is safe for people to swim in and take food from over its entire length.

l. The promotion of improved access to the Waikato River to better enable sporting, recreational and cultural opportunities.

m. The application to the above of both maatauranga Maaori and latest available scientific methods.

Te Ture Whaimana describes 12 strategies that if implemented will achieve the objectives.

1. Ensure that the highest level of recognition is given to the restoration and protection of the Waikato River.
2. Establish what the current health status of the Waikato River is by utilising maatauranga Maaori and latest available scientific methods.
3. Develop targets for improving the health and wellbeing of the Waikato River by utilising maatauranga Maaori and latest available scientific methods.
4. Develop and implement a programme of action to achieve the targets for improving the health and wellbeing of the Waikato River.
5. Develop and share local, national and international expertise, including indigenous expertise, on rivers and activities within their catchments that may be applied to the restoration and protection of the health and wellbeing of the Waikato River.
6. Recognise and protect waahi tapu and sites of significance to Waikato-Tainui and other Waikato River iwi (where they so decide) to promote their cultural, spiritual and historic relationship with the Waikato River.
7. Recognise and protect appropriate sites associated with the Waikato River that are of significance to the Waikato regional community.
8. Actively promote and foster public knowledge and understanding of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community.
9. Encourage and foster a 'whole of river' approach to the restoration and protection of the Waikato River, including the development, recognition and promotion of best practice methods for restoring and protecting the health and wellbeing of the Waikato River.
10. Establish new, and enhance existing, relationships between Waikato-Tainui, other Waikato River iwi (where they so decide), and stakeholders with an interest in advancing, restoring and protecting the health and wellbeing of the Waikato River.
11. Ensure that cumulative adverse effects on the Waikato River of activities are appropriately managed in statutory planning documents at the time of their review.
12. Ensure appropriate public access to the Waikato River while protecting and enhancing the health and wellbeing of the Waikato River.

2.1.2 National Policy Statement for Freshwater Management 2014 (updated 2017)

The National Policy Statement for Freshwater Management 2014 (NPS-FM) and subsequent 2017 amendments set out the objectives and policies for freshwater management under the *Resource Management Act 1991*. It aims to safeguard life-supporting capacity, ecosystems, indigenous species, health of people and communities, maintain or improve (where degraded) overall water quality for primary contact more often, and enable communities to provide for their economic wellbeing in sustainably managing freshwater quality within limits.

The NPS-FM provides national level guidance in the form of freshwater water quality targets for a range of contaminants. Within this guidance the targets are categorised into attributes (A, B and C), with attribute A being the highest standard. Attributes (e.g. total nitrogen) and their associated national bottom lines in the NPS-FM were selected on the advice of specialist science panels[23]. In 2017, national attribute targets were introduced for swimmable lakes and rivers. Ideally water quality should be within attribute A or B target ranges.

On 5 September, 2019, the Ministry for the Environment released its *Action for Healthy Waterways* discussion document for consultation. The document outlines proposed actions and standards intended to limit pollution and improve the health of New Zealand's waterways[24]. This included a Draft National Policy Statement for Freshwater Management, a proposed National Environmental Standard for Freshwater, a proposed National Environmental Standard for Wastewater, and an updated National Environmental Standard for Sources of Human Drinking Water[25].

23 MfE, 2019. Source: https://www.mfe.govt.nz/fresh-water/national-policy-statement/developing-2014-nps

24 MfE, 2019. Action for Healthy Waterways Summary. Retrieved 27 September 2019, from https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/action-for-healthy-waterways-summary.pdf

25 Wynn Williams, 2019. Fresh plans for freshwater – Government proposes reform. Retrieved 27 September 2019, from https://www.wynnwilliams.co.nz/Publications/Articles/Fresh-plans-for-freshwater-%E2%80%93-Government-proposes-r.

2.1.3 Proposed plan change 1 to the Waikato Regional Plan 2014

Healthy Rivers/Wai Ora: Proposed Waikato Regional Plan Change 1 gives effect to objective K of *Te Ture Whaimana* and the NPS-FM. Its aim is to restore and protect the Waikato River so it is safe for people to swim in and take food from its entire length.

The proposed rules encourage the management of nitrogen, phosphorus, pathogens and sediment from land to help clean up waterways in the Waikato and Waipā river catchments. Policy 11 provides a mechanism for councils to apply the best practicable option to avoid or mitigate adverse nutrient effects to fresh water. Where all adverse effects cannot be avoided or mitigated, the policy enables the offset of effects to point source discharges to occur at a different location.

The proposed plan change gives effect to the NPS guidance and *Te Ture Whaimana* by providing location specific short term and 80 year targets for reducing contaminants. The proposed targets were derived from an integrated assessment of the baseline and scenarios based on NPS attribute tables and requirements of *Te Ture Whaimana*. It was developed by a Collaborative Stakeholder Group made up of industry and community representatives who considered technical information provided by a Technical Leaders Group[26].

2.1.4 Cambridge wastewater treatment plant business case

There are several significant three waters servicing projects in the study area that require urgent investment decisions. One is the Cambridge wastewater treatment plant (WWTP).

The Cambridge WWTP is significantly noncompliant with its resource consent and requires considerable investment to bring the plant and overall operation up to an acceptable standard. In addition, Cambridge is experiencing significant residential and industry growth. Wastewater flows for these new developments must also be managed. Waipā District Council has been working through the Cambridge WWTP Project Business Case in parallel with this strategic case (as noted in figure 5).

Waipā District Council could choose to invest in the existing WWTP at Cambridge to meet its short to medium term needs, or a sub-regional solution involving a new plant capable of servicing a much larger area could be utilised. A sub-regional solution could deliver greater environmental gains (through adoption of more advanced technologies that reduce environmental impacts and enable more efficient and effective resource use such as wastewater reuse and recycling, energy and nutrient recovery) and unlock residential and economic development that may better serve the sub-region as a whole. Details of the Cambridge WWTP along with other potential opportunities are included as case studies in Appendix J.

This project seeks to assess these types of sub-regional alternative solutions in order to inform investment decisions like those required for the Cambridge WWTP. It is important that opportunities to implement medium and long term solutions that better achieve the collaboratively agreed project objectives are not lost. However, in order to inform those relatively urgent decisions, the programme business case (phase 2) must be delivered within a 12-18 month timeframe.

2.2 Three waters management and delivery agencies

Hamilton City Council, Waikato District Council and Waipā District Council are responsible for providing and maintaining three waters infrastructure and services to communities in the study area. Their combined annual budgeted expenditure (capital and operational) on these activities was $152 million in the 2017/18 financial year[27].

Under the current funding model, ratepayers or residents are both the owners and consumers of three waters infrastructure services[28] which are funded by rates and user charges. In 2016, the total resident population of the Waikato sub-region three councils was 276,912 people[29].

Each council is looking to achieve specific outcomes from their three waters operations, as described in their respective asset management plans. These outcomes are also reflected in the strategic objectives of the *Future Proof Three Waters Strategy*.

- Ensuring the protection and improvement of public health and safety and providing appropriate water sanitary services and hazard management practices.
- Meeting future anticipated and planned for growth demands.
- Planning for and adapting to climate change.

26 Tomkins Wake. Plan Change 1 to the Waikato Regional Plan –Healthy Rivers Implications for farming. Retrieved 28 August 2019, from https://www.planning.org.nz/Attachment?Action=Download&Attachment_id=4310

27 Waipa District Council, Waikato District Council and Hamilton City Council Long-term Plans 2018- 28

28 DIA, Nov 2017. Review of the three waters infrastructure services: Initial key findings for discussion with the Minister of Local Government. Retrieved 16 Jul 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Review-of-three-waters-infrastructure-services-key-findings-November-2017.pdf

29 Source: Future Proof Strategy, Planning for Growth (2017), Appendix 1 – Allocation and Staging of Growth: Detailed Tables. UoW. Total population is the sum of the territorial authority populations of Waikato District Council, Hamilton City Council and Waipa District Council.

- Ensuring that decisions relating to the three waters are underpinned by best practice, research and knowledge.
- Ensuring quality, efficient and sustainable infrastructure.
- The need for integration of relevant council functions, inter-council departments, the three waters, land use and water planning and management.
- The availability and allocation of water.
- Ensuring that iwi and hapu are involved in the management of three waters and tangata whenua values, aspirations and interests are identified and reflected.
- Ensuring protection and, where possible, the enhancement of the natural environment.

Between 2015 and 2017, Hamilton City Council, Waipā District Council and Waikato District Council came together to consider better ways of providing water, wastewater and stormwater services to their respective communities. Refer to section 3.1.4.1 for further details.

2.3 Current state of the Waikato River

Summary

There is extensive and clear evidence in western science and mātauranga Māori that the river is degraded along much of its length. This is well documented in material prepared to support Treaty of Waitangi claims and settlements (including the Waikato River Independent Scoping Study 2010), technical publications (including the significant body of work completed to support the *Healthy Rivers/Wai Ora: Proposed Waikato Regional Plan Change 1* process) and numerous books written on the subject. These details will not be repeated in this strategic case.

The fact that the overarching purpose of Treaty settlements between river iwi and the Crown relating to the Waikato and Waipā rivers is to "restore and protect the health and wellbeing of the Waikato River" is testament to the degraded current state of the health and wellbeing of the awa. *Te Ture Whaimana* responds to four fundamental issues.

1. The degradation of the Waikato River and its catchment has severely compromised Waikato River iwi in their ability to exercise mana whakahaere or conduct their tikanga and kawa.
2. Over time, human activities along the Waikato River and land uses through its catchments have degraded the Waikato River and reduced the relationships and aspirations of communities with the Waikato River.
3. The natural processes of the Waikato River have been altered over time by physical intervention, land use and subsurface hydrological changes. The cumulative effects of these uses have degraded the Waikato River.
4. It will take commitment and time to restore and protect the health and wellbeing of the Waikato River.

In biophysical terms (typically measured through parameters like nutrient levels, faecal contamination, suspended solids and water clarity), the evidence shows that water quality deteriorates as the river flows from its source to the Tasman Sea. The Waipā River, the largest tributary to the Waikato River, is also a significant source of sediment, nutrients and pathogens.

The causes of degradation include:

- agricultural land use practices and the associated diffuse run-off of nutrients and faecal contamination to surface water and leaching to groundwater
- point source discharges from wastewater treatment plants, industrial activities and geothermal sources
- land confiscations and private ownership impacting development decisions, land modification, access to land, water and resources
- urbanisation and the associated contaminants discharged to land and water along with significant modification of land form and natural waterways
- hydro-power, flood control and other public works that have destroyed or degraded historically and culturally significant sites, reduced access and impacted the connectivity of the river
- dams increase retention time and therefore promote algae growth
- the amount of algae present in the river and therefore elevated suspended solids
- destruction of habitat for key species, especially through land and wetland drainage
- introduction of pest species
- past limits on iwi and public participation in decision making related to the river catchment. (WRISS, 2010)

Biophysical water quality – current state

The water quality monitoring programme for the Waipā and Waikato rivers and tributaries includes 115 sites across the region and is managed by Waikato Regional Council[30]. Water quality along the length of the rivers vary. The causes of this variability are numerous and complex due to the interactions between land use activities and modification, land cover, soils, hydrogeology, groundwater, pest species and the cumulative effects of diffuse source water pollution from land use run-off; point source discharges from wastewater and stormwater systems and extraction of water for domestic and non-domestic uses.

In terms of point source discharges, there are currently 12 wastewater treatment plants in the study area (community wastewater treatment plants are shown in Appendix E). Of the approximately 15 per cent of the New Zealand population whose treated wastewater is discharged directly to fresh water, the study area has the largest population concentration, approximately 281,120 people[31]. Six of these community wastewater treatment plants have consents to discharge to fresh water, only two of which are currently fully compliant with their discharge consent conditions[32].

Diffuse source water pollution, principally from land use, is a very significant source of pollutants entering the river systems. This has increased as land use in some parts of the catchment has intensified (for example conversions from forestry to dairy farming). Land use activities contributed 61 per cent of the nitrogen and 45 per cent of the phosphorous volumes found in the Waikato and Waipā rivers between 2003 and 2012 (see figure 6).

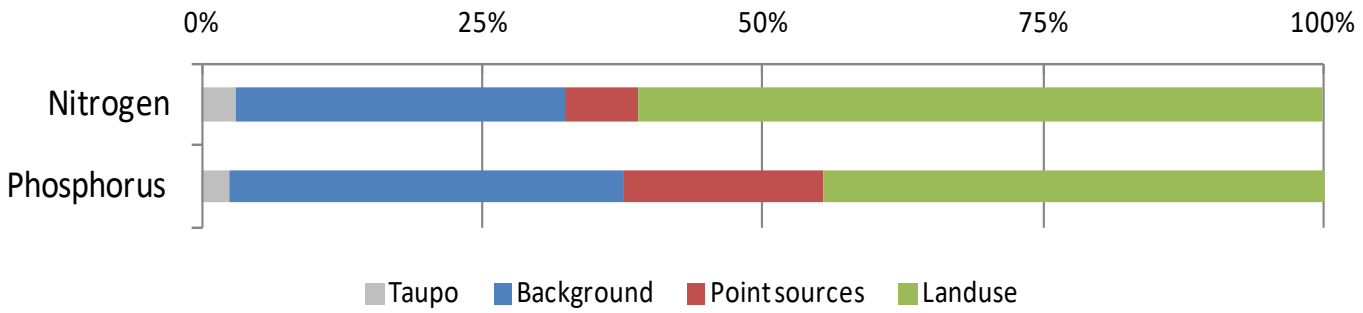


Figure 6 - Sources of nutrients, Waikato/Waipā rivers 2003-2012[33]

The general pattern of the four key indicators of nitrogen, phosphorus, *E.coli* and turbidity/clarity are shown in Appendix D, and in several areas of the catchment the water quality falls short of NPS-FM and *Healthy Rivers/Wai Ora* targets. The condition of the Waikato River is categorised by catchment area location (lower, middle or upper). The study area is primarily in the lower reach.

Water quality of the middle and lower Waikato River is poor when compared to the upper catchment[34] (a map showing the lower, middle and upper Waikato River catchments is displayed in figure 7).

Degradation is due to land use changes along the river, growing side areas of population concentrations, and the cumulative effect of contaminants as water flows downstream[35], particularly in the middle and lower Waikato River. Poor water quality affects interactions of local residents with the river and the water's suitability to support aquatic life; particularly, it means significant reductions in the ability of tangata whenua to collect kai and undertake traditional activities. The presence of *E.coli* downstream from major population centres often means these sections of the river exceed the safe levels for swimming[36]. Trends between 1993 and 2017 show that total nitrogen levels in the Waikato and Waipā rivers have become worse at 70 per cent of the 54 sites continually monitored over this period[37].

30 WRC, 2019.

31 Department of Internal Affairs, September 2018. Three Waters Review: Cost Estimates for upgrading Wastewater Treatment Plants to meet Objectives of the NPS Freshwater Final Report, 3.2.3 Summary of WWTPs discharging to freshwater, Table 3 and 4, page 15.

32 BECA, GHD, Oct 2019. Current State Report, GIS Maps: HCC, GHD, August 2019. Audit Compliance Wastewater Treatment Plant.

33 Source: Presentation by Bill Vant, Waikato District Council, 25 June 2019.

34 Vant, 2010

35 Waikato Regional Council, 2017a.

36 WRC, 2019. How clean is the Waikato River? Water quality for plants and animals, retrieved 15 July 2019, from https://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/Waikato-River/How-clean-is-the-Waikato-River/

37 Ibid. Note: Background is defined as natural contribution.

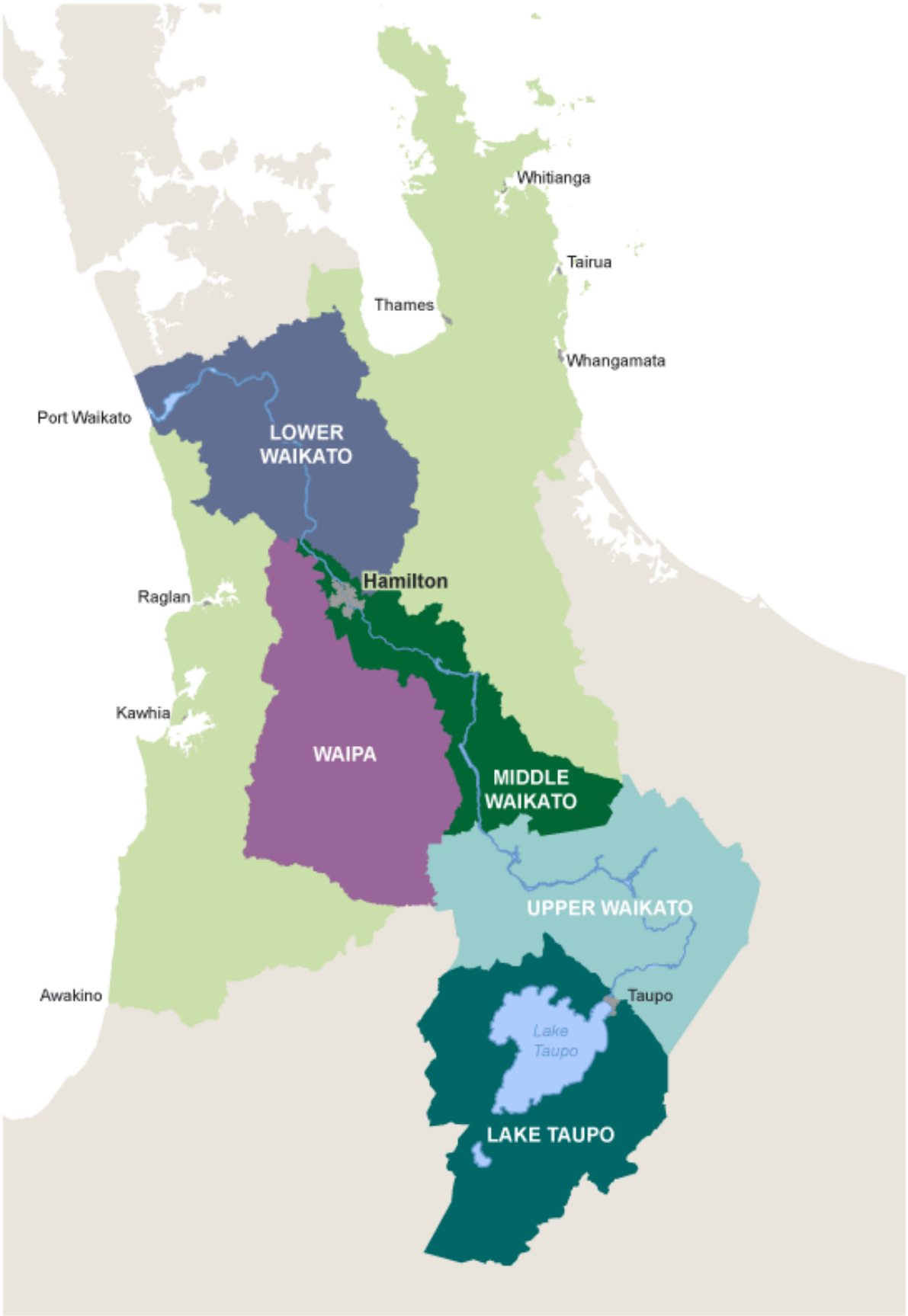


Figure 7 - Lower, middle and upper Waikato River catchments[38]

38 WRC, 2019. Map 2: Project Watershed Management Zones. Retrieved 30 August 2019, from https://www.waikatoregion.govt.nz/Council/Policy-and-plans/Hazard-and-catchment-management/Level-of-Service-and-Funding-Policy/10/Map-2/

Current water quality performance against targets

Current water quality readings for four Waikato Regional Council monitoring sites in the lower, middle and upper reaches of the Waikato River are displayed in relation to NPS-FM and proposed plan change 1 targets in figure 8. The map showing the location of these sites can be found in Appendix D.

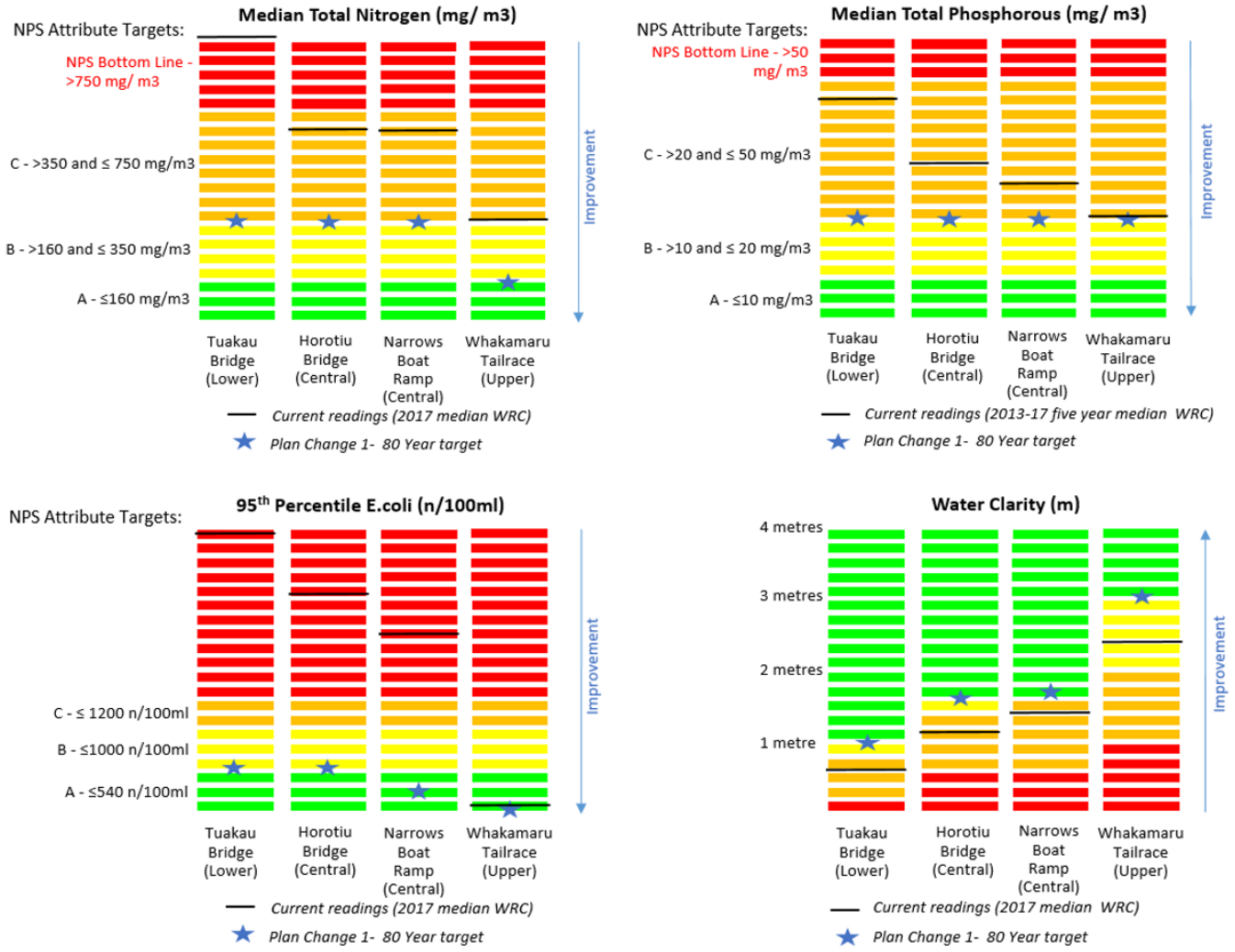


Figure 8 - Waikato River water quality and water quality targets[39]

This data shows that the current state of water quality at these four locations is variable and shows degrading quality with increased distances downstream of the headwaters and water source. Some NPS-FM bottom lines are being met, but overall water quality within the study area is degraded. None of the site specific regional targets outlined in the proposed plan change are being achieved. Significant improvements in performance against the 95th percentile *E.coli* targets are required to satisfy the proposed plan change and NPS-FM target attributes in the lower and middle Waikato River zones (shown in figure 7) to provide safe swimming at these sites of the river[40].

39 Sites selected at random to represent lower, central and upper Waikato River sites. Data and information sourced from Waikato Regional Council Monitoring Sites: Waikato River Water Quality Monitoring Programme (WARIMP), Plan Change 1, NPS 2017. Each figure is drawn to scale.

40 Land and Water Aotearoa, 2019. Retrieved 29 July 2019, from https://www.lawa.org.nz/explore-data/waikato-region/river-quality/waikato-river/

2.4 Three waters infrastructure costs

Three waters infrastructure (water supply, wastewater, and stormwater assets) in the Waikato sub-region is disparate in condition, performance and cost of service delivery. An outline of the water supply, wastewater and stormwater infrastructure assets in the Waikato sub-region can be found in the *Waikato Sub-Regional Three Waters Current State Technical Report* prepared in parallel to this document.

Commentary on specific issues relating to three waters infrastructure and its performance is included in the evidence sections for problem statements in section 3.

Cost of service delivery

Economic data for water, wastewater and stormwater service provisions give an indication of the costs to deliver these services. The information in Appendix I shows the differences between costs of three waters water delivery between the three councils in the Waikato sub-region, and the New Zealand national average in 2017/18. In many instances, capital expenditure and operating costs for water, wastewater and stormwater services varies greatly across the three sub-regional councils when compared to the national average.

On average, the total revenue received per property for the provision of water, wastewater and stormwater services was higher than the New Zealand national average. The average total revenue received per property in the Waikato sub-region (2017/18) was $709 for water supply compared to the national average of $553; $899 for wastewater compared to the national average of $673; and $240 for stormwater compared to the national average of $170[41].

A 2015 business case examining different delivery options for water services in the Waikato sub-region forecasted significant efficiencies could be achieved by utilising a more collaborative approach. It forecasted cost savings starting at $27 million between 2017/18 and 2026/27 if an enhanced shared water services delivery option was adopted rather than the status quo[42].

2.5 Future growth

The Future Proof strategy, *Planning for Growth* (2017), is a growth strategy specific to the Hamilton, Waipā, and Waikato sub-region. It forecasts the populations of Hamilton city, Waikato district and Waipā district will grow significantly over the next 30 years. These population growth forecasts (according to the University of Waikato) are displayed in figure 9 over the page.

The populations of these three areas are expected to grow between 46 per cent and 51 per cent between 2016 and 2045, putting very significant pressure on crucial infrastructure including three waters infrastructure.

Further to the Future Proof growth projections, the Government's Urban Growth Agenda (UGA) aims to remove barriers to the supply of land and infrastructure and make room for cities to grow. Spatial planning is one of five UGA focus areas, and is initially focused on the Hamilton to Auckland Corridor.

It is critical that spatial planning in the sub-region is integrated with the waters focus area and the three waters project to ensure that the overall health and wellbeing of the Waikato River is improved.

Emerging themes from the Hamilton-Waikato spatial planning process include providing for a total population in the wider metro area (generally from Cambridge and Te Awamutu through to Taupiri) of around 400,000 people in the next 50 years.

Phase 2 of the review of Future Proof will produce a *Future Development Strategy* (FDS) for the sub-region in accordance with the National Policy Statement on Urban Development Capacity (NPS-UDC). The development of the FDS will commence once the spatial plans for the Hamilton to Auckland Corridor are completed.

In addition to the spatial planning work being undertaken through the *Hamilton to Auckland Corridor Plan*, Waikato District Council is reviewing its *District and Economic Growth Strategy* (DEGS) to inform its proposed district plan hearings. This document is expected to be approved in early 2020. The DEGS will also inform the FDS.

All of these planning processes will need to be filtered through a three waters infrastructure lens to ensure that provision for growth, including potential high water use and activities associated with wet industry, can be met without compromising environmental outcomes.

41 Source: Water New Zealand National Performance Review (2017-2018). Retrieved 21 August 2019, from https://www.waternz.org.nz/Category?Action=View&Category_id=999

42 Cranleigh Corporate Finance and Advisory, May 2015. Business Case for Water Services – Delivery Options: Part B Detailed Report, Pg. 20, https://web.archive.org/web/20190204173751/http:/www.waterstudywaikato.org.nz/uploads/files/Part%20B%20-%20Final.pdf – (Enhanced Shared Services option)

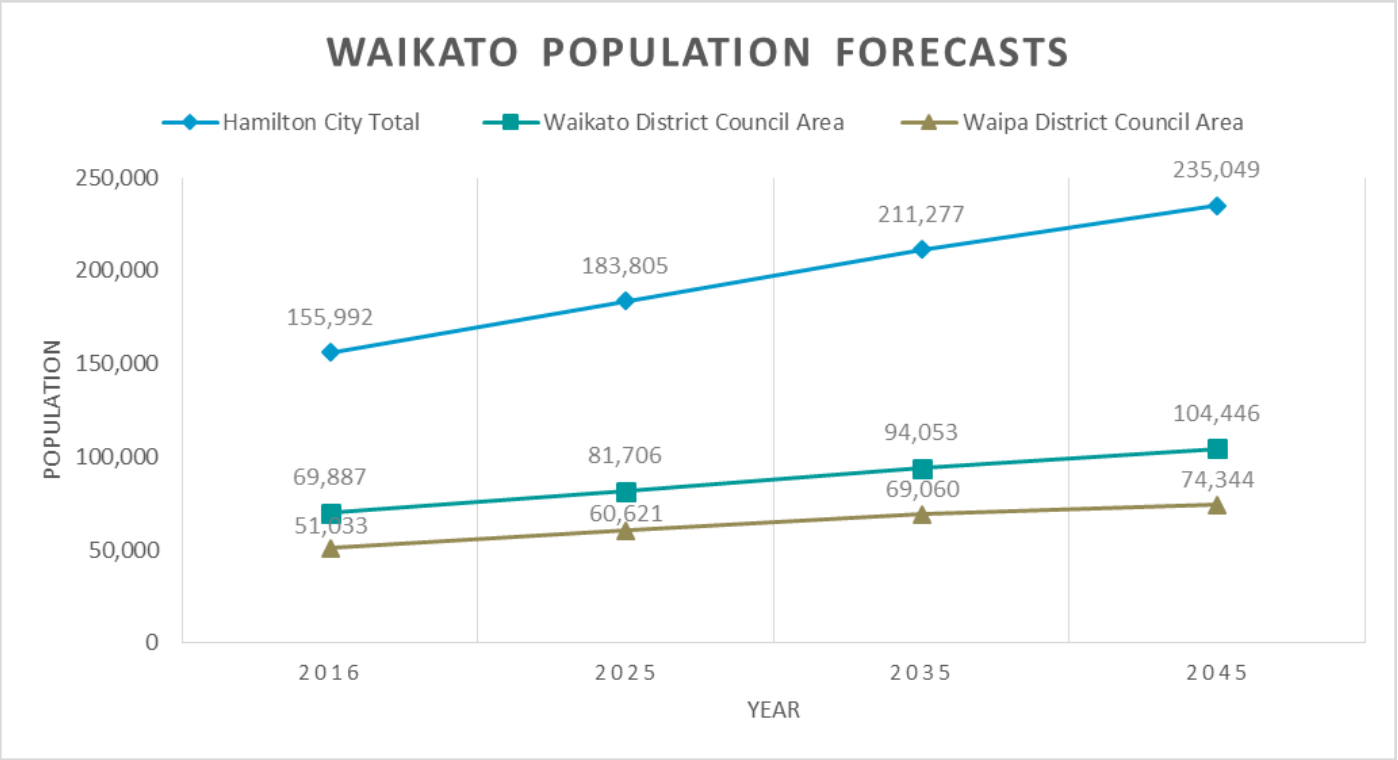


Figure 9 - Population forecasts[43]

43 Source: Future Proof Strategy, Planning for Growth (2017), Appendix 1 – Allocation and Staging of Growth: Detailed Tables. UoW Medium population forecasts used.

3. Outlining the need for investment

This section summarises the key problems or drivers of change in the provision of three waters services in the Waikato sub-region. The misalignment between the current state and desired future state creates a compelling case for change.

3.1 Defining the problem

Investment logic mapping is a series of structured workshops with key stakeholders to agree on problems, benefits and outcomes prior to investment in solutions. Facilitated workshops to define what was Best for River took place on 25 June and 5 September, 2019. They were preceded by a facilitated investment logic mapping workshop on 14 May, 2019. At the workshop, project partners agreed the current, "business as usual" approach would not contribute to Best for River outcomes as national water quality targets and *Te Ture Whaimana* objectives would not be achieved.

Four key problems, which provide the evidential basis for change, were identified. Further details about the current state situation can be found in the *Waikato Sub-Regional Three Waters Current State Technical Report*.

3.1.1 Problem statement 1 – Lack of integrated management (25%)[44]

There is a lack of integrated catchment management and urban waters long term planning. There is an absence of a common vision and agreed future outcomes that are unconstrained by territorial boundaries. Insufficient application of both mātauranga Māori and conventional science methods, and inadequate funding provisions, is resulting in inefficient near sighted decision making and the degraded health and wellbeing of the Waikato River.

3.1.1.1 Evidence of the problem

Problem statement 1 relates to the lack of integrated and holistic land and water management across the Waikato River catchment and specifically across the study area. While *Te Ture Whaimana* provides the basis for a common vision across the river catchment, it is not integrated into individual territorial authority planning instruments or strategic documents.

Despite *Te Ture Whaimana* being in place for more than 10 years it does not appear to be used as the primary direction setting document for development in the Waikato River catchment as was intended at the time of the Waikato Raupatu River Settlement.

Land use planning and growth is not proceeding as agreed in the *Future Proof Growth Strategy* in 2017. This creates uncertainty around infrastructure servicing requirements, both in terms of when infrastructure is needed and what it should be sized to accommodate. This can also mean that the three territorial authorities are effectively competing against each other for sought after development. This results in variable consent conditions and permitting land use activities which can be economical in the short term but potentially harmful to the sub-regional freshwater environment when development occurs in inappropriate or suboptimal locations and precedes the critical infrastructure needed to support it.

Land related water use activities in the Waikato have also changed in the last 50 years from mostly controlled point source takes and discharges to now being mainly allocated to intensive land use activities producing increased diffuse contaminants[45]. Traditionally, point source activities were easier to regulate and monitor than diffuse contaminants, as diffuse contaminants can have larger adverse impacts on the catchment environment as a whole. These impacts are beginning to be recognised through regional policy such as proposed plan change 1 which seeks to reduce the contaminant loads entering into the Waikato and Waipā catchments to achieve *Te Ture Whaimana*. An integrated land use strategy for the sub-region is needed to give effect to agreed future outcomes and *Te Ture Whaimana*.

44 The percentages indicated with each problem statement is an initial assessment of relative weighting given to each statement. This helps identify which problems are of greatest value. This will be tested further through the business case development process.

45 WRC, 2017. Waikato Freshwater Strategy1.7.1 Policy Tools No Longer Fit For Purpose, page 18. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

Short term decision making

The lack of an integrated strategy results in short term decision making that delivers limited progress towards the desired *Te Ture Whaimana* outcomes. This short term decision making creates three waters infrastructure capacity issues when networks and systems must service unplanned growth in residential, commercial and industrial activities.

Areas of planned growth in the Waikato sub-region which require investment to increase water and wastewater treatment capacity in the next 10 years are noted on maps in Appendix H. The water treatment plants requiring investment include Hamilton, Te Kauwhata, Huntly and South Te Awamutu[46]. The wastewater treatment plants requiring investment include Hamilton, Cambridge, Te Awamutu, Tūākau, Pokeno, Te Kauwhata, Meremere, Huntly and possibly Te Kōwhai.

These critical service capacity constraints have an economic cost. Residential developments are unable to occur and businesses are unable to expand their operations.

Further details on the future growth areas and the need for infrastructure provisioning at these sites can be found in the current state technical report.

Unserviced developable land

The study area includes several areas either zoned for development or with significant development potential located on the periphery of existing urban settlements. Many of these areas, such as Te Kōwhai and the Hamilton Airport industrial area, have limited three waters services currently and in some cases no servicing is planned despite the clear need for it. This means the land is zoned for development without sufficient long-term servicing solutions, or development is prevented, despite the potential to unlock significant economic potential.

Integrated environmental improvement

Urban development, when not based on an integrated land use and infrastructure planning approach with sound environmental outcomes in mind, often results in some level of adverse environmental and social impacts. This is true even when best practice development principles such as water sensitive city development and low impact urban design principles are applied. *Te Ture Whaimana* requires development to result in an overall improvement in the health of the Waikato and Waipā rivers.

In some instances, investing in restoration activities away from the urban development, rather than solely concentrating locally, may be more effective at achieving the objectives of *Te Ture Whaimana*. In order for this to occur, a whole of river and whole of catchment approach must be taken.

Unrealised potential of Waikato Expressway investment

The interdependencies between transport, land use and water services are clear. The Government has invested more than $2 billion in the delivery of the Waikato Expressway. Appropriate land use to take advantage of that investment will be developed through the *Hamilton to Auckland Corridor Plan*. The three waters servicing challenges associated with sub-regional development, along with legal obligations to improve the health and wellbeing of the river, must be addressed in order for the proposed land use and development to occur, and for the full potential of the Waikato Expressway investment to be realised.

3.1.1.2 Implications of the evidence

A high level spatial intent for the corridor with agreed future outcomes is under development in the form of the *Hamilton to Auckland Corridor Plan*. However, without a sub-regional three waters approach enabling the 20 initiatives in the corridor plan, regional development opportunities will be lost. This could compromise progress towards *Te Ture Whaimana* objectives and Best for River outcomes.

3.1.2 Problem statement 2 – Historic decisions resulting in degraded environment and relationships (50%)

Inconsistent, short term and boundary driven regulatory, planning and investment decisions on land use and urban water resource management have contributed to cultural disconnect, degraded water quality, poor ecosystem health and over allocated resources. As a consequence, the relationships our communities have with the Waikato River and the ability of Waikato River iwi to exercise mana whakahaere or conduct their tikanga and kawa have been severely compromised.

46 Future Proof Partners (BECA, GHD), September 2019. Current State Report

3.1.2.1 Evidence of the problem

Historic decisions resulting in degraded environment and relationships

Problem statement 2 relates to historic decisions which have led to the degradation of the Waikato River and environment, and the relationships of iwi and communities with the river. This strategic case does not attempt to provide a comprehensive assessment or account of the types and range of these historic decisions, however, they include historic breaches of the Treaty of Waitangi and subsequent land confiscations; catchment modification through to RMA planning instrument decisions; zoning, rules and resource consents; and inadequate enforcement of consent conditions.

A few planning examples are included in this strategic business case.

Water allocations have historically been made on a first in, first served basis. Policy 7 of the *Waikato Regional Plan* (WRP) outlines Waikato River water allocation limits within the context of this historical decision making. It recognises and accommodates this legacy thinking around fresh water resource management by specifying certain historical exceedances to allocable flows that do not represent water over-allocations (for the purposes of the NPS-FM). An example is a controlled activity for existing milk cooling and dairy shed wash down takes where applications to authorise those takes are lodged prior to 1 January 2015[47].

Any existing allocation of surface water that exceeds the combined primary and secondary allocable flows will not be phased out until 31 December 2030 in accordance with Policy 19 (*Waikato Regional Plan*)[48].

The aforementioned exception to Policy 7 of the WRP also displays the lack of historical restrictions for land use changes in the Waikato River catchment. In 2007, 48 per cent of the upper Waikato River catchment was used for pastoral agriculture purposes, and there was potential for conversion of a further 24 per cent of exotic forest to pastoral agriculture over the following 15 years[49]. Historically, land conversion decisions were made without a holistic view of the impacts, and consents for water takes or wastewater discharges were made without reference to a centralised Best for River approach.

In relation to consent compliances as referenced in the current state section of this business case, only two of the 12 wastewater treatment plants in the Waikato catchment that discharge treated water to fresh water fully comply with their respective consent conditions[50]. Best water management practices are beginning to be more commonly adopted in line with *Te Ture Whaimana*, but there remains a lack of alignment between the three councils on appropriate development rules, performance standards and targets (despite shared technical specifications). This is resulting in the over-allocation of water resources during low flow summer conditions, and continued degradation of the Waikato River at a time when collective action is needed to restore and protect the health and wellbeing of the river.

Water over-allocation and constrained growth

The over-allocation of water in the Waikato sub-region is evidenced by the number of current authorisations (existing legal rights to take water) present in the Waikato River catchment in relation to primary allocation limits. Primary allocable flow is defined as the high reliability allocation available in each waterway[51]. The primary allocation limit for the Waikato River is 18.67m^3/s, with a target of allocations of under 70 per cent of this primary allocation limit (table 3-5 of the regional plan). The Waikato River coastal marine area (CMA) as a whole achieved less than this limit for five months in 2018 but exceeded it in the remaining seven summer months from October to April[52].

47 WRC, April 2012. Proposed Waikato Regional Plan, Variation No.6 – Water Allocation, Operative (10 April 2012), Policy 7, page 17. Retrieved 21 August 2019, from http://www.waikatoregion.govt.nz/assets/PageFiles/7062/n2141102_v1_OPERATIVE_version_-_Variation_No__6March2012.pdf

48 WRC, April 2012. Proposed Waikato Regional Plan, Variation No.6 – Water Allocation Operative (10 April 2012), Page 21. Retrieved 21 August 2019, from http://www.waikatoregion.govt.nz/assets/PageFiles/7062/n2141102_v1_OPERATIVE_version_-_Variation_No__6March2012.pdf.

49 Environment Waikato, 2007. Project Brief: Effects of Land Use Change on the Flood Hydrology of the Waikato River Catchment Between Karapiro and Taupo, Retrieved 31 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/10839/projectbriefeffectslanduse.pdf

50 ture Proof Partners, 2019. Sub Regional Three Waters Study, Audit Compliance, Wastewater Treatment Plants. 13 August 2019

51 Source: WRC, 2019. Frequently asked questions: Dairy shed water takes. Retrieved 20 August 2019, from https://www.waikatoregion.govt.nz/assets/WRC/Services/regional-services/consents-and-compliance/water-takes/2252386-FAQ.pdf

52 WRC, 2019. Water Allocation Levels. Retrieved 21 August 2019, from http://waterallocation.waikatoregion.govt.nz/levels

The over-allocation is based on the assumption that all users consume their full consented allocation amount at all times.

Constrained growth is represented by the number of pending applications with Waikato Regional Council to take fresh water for land uses. There are currently 280 applications in the allocation queue for surface water takes in the Waikato region as at 21 August 2019[53].

These applications for water takes are all on a first in, first served wait list, and are on hold as they will exceed the allocation limits for catchments in the region[54].

Poor water quality, ecosystem health and cultural disconnect

Proposed plan change 1 to the *Waikato Regional Plan* is targeted at achieving *Te Ture Whaimana* in an 80 year timeframe. This includes achieving water quality that is swimmable and safe for food collection along the entire length of both the Waikato and Waipā rivers and their tributaries.

The propose plan change identifies targets for key contaminants contributing to poor water quality of the Waikato River, including nitrogen, phosphorous, sediment, ammonia and *E. coli*. Trends showing relative improvements or degradations for these contaminants and others were examined across 54 sites of the Waikato and Waipā rivers and tributaries between 1993 and 2017. Results of these measurements are shown in figure 10. Significant improvements in the presence of ammonia, total phosphorous and *E. coli* were shown in many locations, but significantly increased levels of total nitrogen and turbidity, and reductions in visual clarity, were also seen[55].

Nitrogen contaminants are usually a result of diffuse source pollution, particularly from farming land uses. The total out of waterbody Waikato regional surface water use (including irrigation) is 1.7 million m3 per day, and nearly half of this water use is for irrigation of pasture and crops. This suggests pastoral intensification land uses in the Waikato are driving the total nitrogen contamination increases in the Waikato River.

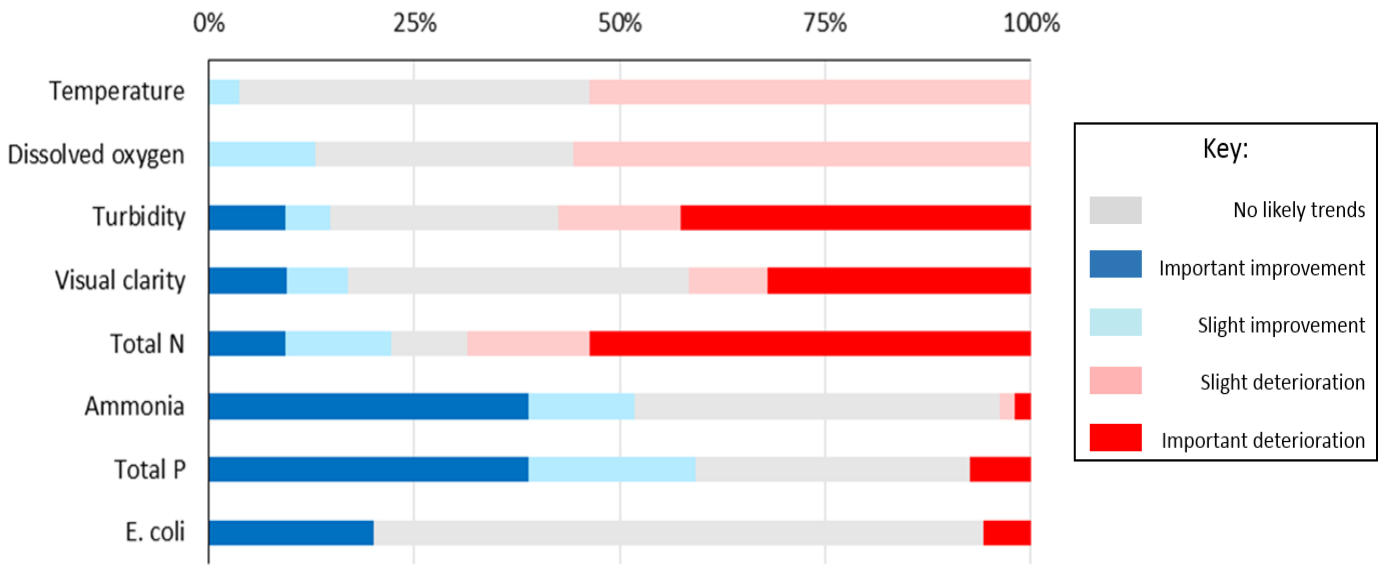


Figure 10 - Water quality trends at 54 tributary sites of the Waikato and Waipā rivers, 1993-2017[57]

Nitrogen levels have an ecological impact as they feed nuisance plants and aquatic life which can impact overall ecosystem health. Waikato Regional Council water quality readings between 2014 and 2017 indicate the water quality for plants and animals was considered over 30 per cent unsatisfactory in the lower Waikato River[58].

53 WRC, 2019. Water Allocation Levels. Retrieved 21 August 2019, from http://waterallocation.waikatoregion.govt.nz/levels

54 WRC, July 2017. Waikato Freshwater Strategy Te Rautaki Wāimaori Mō Waikato, Page 7. Retrieved 21 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

55 Source: Presentation by Bill Vant, Waikato District Council, 25 June 2019.

56 WRC, July 2017. Waikato Freshwater Strategy, 1.3.1 Surface Water, Page 10. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

57 Source: Presentation by Bill Vant, Waikato District Council, 25 June 2019.

58 WRC, 2019. How clean is the Waikato River? Water quality for plants and animals, retrieved 15 July 2019, from https://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/Waikato-River/How-clean-is-the-Waikato-River/

The presence of *E.coli* downstream from major population centres demonstrates poor water quality and ecosystem health in the Waikato River, and often means sections in the central to lower catchments of the river exceed safe levels for swimming[59]. At all of the Waikato Regional Council water quality monitoring sites in the lower catchment[60] (north of Hamilton) water quality is such that swimming and fishing in the Waikato River is not recommended by the regional council[61].

Many of the water quality measurements at these sites show there are large discrepancies between actual water quality and the desired proposed plan change 1 and NPS targets, as shown in Appendix G. These adverse conditions limit the number of cultural and recreational interactions people want to have with the river.

3.1.2.2 Implications of the evidence

There needs to be an alignment of land use planning provisions; alignment and consistent three waters servicing consent conditions and a holistic land use planning approach across the Waikato River catchment. Significant progress towards Best for River outcomes can only be made with collective consent requirements and collaborative, water and land use planning in line with rules and objectives of an operative plan change 1 and *Te Ture Whaimana*.

3.1.3 Problem statement 3 – Inadequate infrastructure planning and inconsistent regulatory oversight (15%)

Reactive infrastructure planning practices coupled with inadequate regulation and compliance and inconsistent management practices, standards and performance expectations have led to a variable urban water system performance across the region. This has adversely impacted the health and wellbeing of the Waikato and Waipā rivers.

3.1.3.1 Evidence of the problem

Inadequate infrastructure planning

There are many examples in the sub-region of land use planning and development decisions occurring without the necessary three waters infrastructure being in place. Examples of this exist in Te Kauwhata, Te Kōwhai, in some Hamilton growth cells, at the industrial areas around the airport and in Cambridge.

In addition, councils are often slow to fully understand and respond to new regulatory requirements. As a result, the necessary funding and infrastructure needed to deliver higher levels of service (e.g. higher wastewater treatment standards and stormwater quality improvements) arising from new regulatory requirements often drags behind development resulting in environmental degradation.

Evidence of this can be seen in the substantial investment now required to bring water treatment and wastewater treatment plants up to acceptable performance standards. In the Waikato Region, to meet minimum policy guidance standards, an estimated $30.3 million to $56.3 million of capital investment is needed for water treatment plants[62], and $240 million to $360 million for wastewater treatment plants[63]. Note: these estimates do not reflect the unique challenges faced in the Waikato in relation to the performance standards (and resulting investment) necessary to contribute toward achieving *Te Ture Whaimana* and the overarching obligation to "restore the health and wellbeing of the Waikato River". The actual costs associated with meeting both the current and proposed regulatory requirements along with growth demands need to be determined.

The inability to invest in – or even realise – cross boundary opportunity is a significant issue. A 2007 sub-regional wastewater investigation and a 2009 sub-regional water treatment plant investigation both failed to gain traction past the investigation stages. Had they progressed, they would have provided the organisations involved with certainty of supply, greater resilience and greater cost efficiencies.

59 Ibid.

60 Water Quality Monitoring Sites include: Tūākau, Mercer, Huntly, and Horotiu Bridge.

61 WRC, 2019. Waikato River water quality monitoring sites. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/environment/natural-resources/water/rivers/waikato-river/map/

62 Beca, March 2018. Cost Estimates for Upgrading Water Treatment Plants to Meet Potential Changes to the NZ Drinking Water Standards. Retrieved 22 August 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Beca-report-Cost-Estimates-for-Upgrading-Water-Treatment-Plants.pdf

63 GHD, Boffa Miskell, Sept 2018. Cost Estimates for Upgrading Wastewater Treatment Plants to meet objectives of the NPS Freshwater. Retrieved 22 August 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-documents/$file/Costs-of-wastewater-upgrades-GHD-Boffa-Miskel-Final-report-Oct-2018.pdf

Regulation, compliance and inconsistent standards

Regulatory requirements (in the form of regional resource consent conditions and district planning provisions) and levels of enforcement consistency within Hamilton City Council, Waipā District Council and Waikato District Council differ significantly. The source of misalignment could be attributed to each council's individual interpretation and approach to part 2 of the RMA where it is considered appropriate to trade off or balance economic, societal and environmental matters[64]. This has resulted in varied infrastructure and stormwater discharge compliance outcomes. In many instances, consent conditions and their enforcement have not resulted in compliance with environmental standards and alignment with iwi's strategic vision for water quality of the Waikato River.

Urban water system performance

The general performance of three waters infrastructure is reflected through meeting certain levels of service. The Department of Internal Affairs (DIA) has mandated measures in place for three waters infrastructure (shown in Appendix F). Two of these measures are: compliance with Drinking-water Standards for New Zealand and discharge compliance with resource consents. Both drinking water standards compliance for water supply and consent compliance for wastewater treatment plants and stormwater discharges vary across the sub-region.

There are 14 water treatment plants (for drinking water supply) operating in the sub-region. Ten are fully compliant with their respective consent conditions, three are bacteria compliant only and one is not compliant[65].

There are 12 wastewater treatment plants in the Waikato catchment that discharge treated water to fresh water. Only two comply fully with their respective consent conditions. Only three demonstrate a high level of consent compliance and three are significantly noncompliant.

There are 42 active stormwater network discharge consents to fresh water in the Waikato sub-region. Currently 67 per cent of these stormwater discharges in the study area do not fully comply with their consent conditions[66].

Maps outlining the locations of water and wastewater treatment plants and their current consent compliance can be found in Appendix E.

Degraded environmental quality

The water quality of the Waikato River varies significantly by site location. Generally, fresh water upstream of Lake Karāpiro is of good quality. Downstream, in lowland areas, water quality is severely degraded due to the cumulative effect of land use activities along the river. Few monitoring points in the middle and lower catchments between 1993 and 2017 have recorded waters that would meet the NPS freshwater categories A, B or C or Plan C for swimmability. The water quality variability of the Waikato River against these key indicators is shown in Appendix D.

Water quality measurements at four sites situated in the upper, middle and lower catchments of the Waikato River are presented in Appendix G. At the three representative sites in the lower and middle catchment of the Waikato River, none of the targets for *E.coli*, clarity, phosphorous and nitrogen in the proposed plan change or Attribute A of the NPS-FM were achieved in 2017/18.

At the upper catchment representative site, only the Attribute A target for *E.coli* and the short term target for water clarity in the proposed plan change were achieved. This widespread poor water quality and declining water quality trends at multiple Waikato River water quality monitoring sites against national and regional policy targets shows that significant progress is still required to achieve optimal and targeted water outcomes in line with *Te Ture Whaimana.*

3.1.3.2 Implications of the evidence

There needs to be greater collaboration and aligned infrastructure planning practices between the three councils to work towards agreed long term sub-regional investment outcomes. The adoption of agreed practices to achieve outcomes over a 100 year horizon will reflect the lifetime of the more significant infrastructure assets and provide long term return on investment for the community. The collaborative sub-regional planning practices and aligned investment outcomes should see the efficient procurement and delivery of three waters services, consent consistency and planned land use developments with flow-on effects that improve water quality.

64 WRC, July 2017. Waikato Freshwater Strategy, 1.7.3 Policy Misalignment. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

65 Future Proof Partners, 2019. Sub Regional Three Waters Study, Water Supply Drinking Water Standards Compliance. 27 September 2019

66 Future Proof Partners, 2019. Sub Regional Three Waters Study, Audit Compliance, Wastewater Treatment Plants. 27 Sep 2019

3.1.4 Problem statement 4 – Infrastructure Investment deficit (10%)

There are significant affordability challenges, as well as maintenance, operational and resource (skill) capacity issues, in the sub-regional three-waters space. These are driven by a legacy of underinvestment in urban water systems; infrastructure reaching the end of its life; increasing regulatory requirements and environmental expectations; climate change impacts and greater growth demands. Combined, this has created a significant investment deficit within the sector.

3.1.4.1 Evidence of the problem

Underinvestment in urban water systems

Historically, there has been underinvestment in urban water systems in the Waikato sub-region. This is because of local government debt ceilings, the current ratepayer service delivery model, community pressure to keep rates increases to a minimum and decisions to invest ratepayer funding in other community services.

This underinvestment is part of the reason why significant investment is now required to upgrade water treatment plants to comply with drinking water standards, and to upgrade wastewater treatment plants which discharge to fresh water to meet NPS-FM guidance.

An estimated $240 million to $360 million is required to upgrade existing wastewater treatment plants in the wider Waikato region to meet NPS-FM Attribute B targets for discharge to fresh water[67]. An estimated $30.3 million to $56.3 million capital cost is estimated to be needed in the wider Waikato region to make all water treatment plants comply with Drinking-water Standards for New Zealand[68].

Historical underinvestment in stormwater can be evidenced by relatively small levels of investment in catchment management plans by local authorities. In recent years, the number of catchment management plans developed in the Waikato sub-region have increased significantly but disparities remain between councils. Further information can be sourced from section 5.4 of the current state technical report.

Infrastructure reaching end of life and no longer fit for purpose

Significant parts of the three waters infrastructure in the Waikato sub-region are reaching the end of their useful life and in many instances are no longer fit for purpose. This is due to multiple factors such as the age of assets, historic material and construction methods resulting in poor asset performance; increased demand (and associated flows); climate change (in the case of drainage networks) and an evolution in urban water management that has moved beyond purely functional infrastructure to more integrated and holistic water management to deliver better ecosystem outcomes.

All three councils have financial constraints resulting from the current ratepayer funding model, meaning significant affordability challenges in meeting current and future infrastructure costs.

A key component of a three waters system is the pipe network. Pipelines in poor or very poor condition can lead to water loss and inefficiencies. The condition of three waters pipelines in Hamilton City Council, Waipā District Council and Waikato District Council jurisdictions are in table 3 below.

Table 3 - Waikato sub-region three waters network pipeline percentage in poor or very poor condition[69]

Percentage of pipelines assessed as poor or very poor condition	Hamilton	Waipā	Waikato
Water	24%	5%	34%
Wastewater	7%	12%	12%
Stormwater	2%	6%	12%

67 GHD, Boffa Miskel, 2018, Three Waters Review, Cost Estimates for Upgrading Wastewater Treatment Plants to meet objectives of the NPS for Freshwater. DIA. Retrieved 4th Oct, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-documents/$file/Costs-of-wastewater-upgrades-GHD-Boffa-Miskel-Final-report-Oct-2018.pdf

68 Beca, 15 March 2018. Cost Estimates for Upgrading Water Treatment Plants to Meet Potential Changes to the New Zealand Drinking Water Standards. Summary of Estimate of Probable Costs Table. Retrieved 29 October 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Beca-report-Cost-Estimates-for-Upgrading-Water-Treatment-Plants.pdf

69 WaterNZ, 2017/18. Percentage of water pipelines assessed as poor or very poor condition, Stormwater. Retrieved 29 July 2019, from https://www.waternz.org.nz/Category?Action=View&Category_id=1008

Pipelines in poor condition carry increased risks of failure and can lead to water loss and inefficiencies. This can drive up operational and capital expenditure costs associated with service delivery. The average three waters service delivery and expenditure costs per property for the three council jurisdictions in the sub-region (2017/18) is outlined in Appendix I.

When examining the average capital expenditure and operating cost per property for 2017-18, average costs were higher in the Waikato sub-region than the national average for water capital expenditure, wastewater capital expenditure and operational expenditure, and stormwater capital expenditure per property. Overflow numbers can also represent an infrastructure system that is not operating efficiently or is fit for purpose. The number of dry weather wastewater overflows and constructed wet weather wastewater overflows in the Waikato sub-region are shown in table 4.

Table 4 - Wastewater overflow data Waikato region[70]

Territorial authority	Number of dry weather overflows per 1000 rated properties (2017-2018) calculated figures from Stats NZ total populations	Number of constructed wet weather overflows per 1000 connected rated properties per year over the last 5 years (2013-2018)
Hamilton City Council	2.92	0.84
Waikato District Council	1.98	2.20
Waipā District Council	1.00	0

Increasing regulatory requirements and environmental expectations

Central and local government regulations around improving the quality of fresh water have been introduced in response to changing community environmental expectations and *Te Ture Whaimana*. Some of these, such as the NPS-FM and proposed plan change 1, specify short and long term targets for the water quality of the Waikato River. Current river water quality conditions generally fall short of these targets (as detailed in section 2.3).

In September 2019, the Ministry for the Environment released its *Action for Healthy Waterways*[71] discussion document for consultation. The document outlines proposed future actions and standards intended to limit pollution and improve the health of New Zealand's waterways, and signals increased central government regulation and targets on the horizon to improve freshwater environments. Improving plant efficiencies to meet current and proposed future standards is supported by local authorities, but there are significant extra costs associated with this. This cost to lift performance to meet current needs, coupled with capacity upgrades required to service growth, further exacerbates genuine affordability issues.

Current funding constraints and unaffordable current and future costs

The combined budgeted expenditure on water supply, wastewater and stormwater of Waikato District Council, Hamilton City Council and Waipā District Council between 2018 and 2028 is $1,570 million[72]. The councils regularly experience financial constraints in the form of rate increase limitations and debt to revenue ratio limits. It is expected (as outlined in the three councils' long term plans) that these financial limits will be reached by Hamilton City Council, Waipā District Council and Waikato District Council over the next 10 years in part to cover the increasing three waters costs.

- Hamilton City Council debt to revenue ratio limit is set at 230 per cent debt. Hamilton City Council expects to stay within this limit. Net debt is expected to a peak of $776 million in 2028.
- Waipā District Council debt to revenue ratio limit is set at 175 percent debt. Waipā District Council expects stay within this limit. Net debt is expected to rise from $13 million in 2018 to $184 million.
- Waikato District Council debt to revenue ratio limit is set at 150 per cent debt. Waikato District Council expects to stay within this limit. Net debt is expected to rise to an estimated $180 million[73].

70 Statistics NZ, 2018.

71 MfE, 2019. Action for Healthy Waterways Summary. Retrieved 27 September 2019, from https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/action-for-healthy-waterways-summary.pdf

72 This is the total amount funded in the Waikato, Waipa and Hamilton 2018-28 Long Term Plans (excluding funding specifically allocated for Raglan) for water, wastewater and stormwater capital and operational expenditure. Source: Future Proof Partners, GHD, Beca, Sub Regional Three Waters Study, 18 February 2019.

73 Information sourced from the three council's long-term plans 2018-28.

Three waters infrastructure in the Waikato sub-region is reaching its end of life and hence is in poor condition. Combined with high levels of local government debt, the current and future costs for new infrastructure (including their maintenance and operations) will present significant affordability challenges.

The populations of the three local authority areas are forecast to grow between 46 per cent and 51 per cent between 2016 and 2045[74]. Concerns exist around the ability of local government to fund the levels of investment needed to ensure that three waters infrastructure meets population demands and community performance expectations and contributes toward achieving *Te Ture Whaimana* and the NPS-FM.

Operations, human capacity and capability challenges

There are significant operational, human capacity and capability challenges across New Zealand's three waters sector, and the Waikato sub-region is no different. The Department of Internal Affairs' Three Waters Review in 2018 found that the industry has capacity, capability and sustainability challenges, particularly in smaller organisations. DIA found that scale plays a role in relation to service quality, compliance, asset management and governance capability. Smaller local authorities generally have fewer resources more widely spread across many activities[75]. The large land area and number of water and wastewater treatment plants (27) in the Waikato sub-region means resources are often stretched.

Between 2015 and 2017, Hamilton City Council, Waipā District Council and Waikato District Council came together to consider better ways of providing water, wastewater and stormwater services to their respective communities. During this time, a number of options were considered including an asset owning council-controlled organisation (CCO) and a shared waters management company (i.e. non-asset owning CCOs).

Both Hamilton city and Waipā district councils formally consulted with their communities on forming a shared waters management company with their two councils as founding shareholders. Following the public consultation period, Hamilton City Council resolved to proceed with forming a shared waters management company, but Waipā District Council rejected the proposal.

Waikato District Council resolved to contract Watercare Services Limited to deliver water management services for the district. Waikato District Council established an independent water governance board to drive the delivery and implementation of contractual arrangements with Watercare, including providing strategy input, oversight and monitoring of water services delivery.

From 1 October, 2019, Watercare Services Limited will be contracted to provide three waters services within the Waikato district. The contractual arrangements will be overseen by a waters governance board, an independent body appointed by Waikato District Council. Waikato District Council will continue to own the three waters assets. The contract is initially for a two year transitional period and then up to a further 27 years.

3.1.4.2 Implications of the evidence

The April 2018 report *Review of three waters infrastructure: key findings and next steps* states there will be broad national and local implications if performance improvements are not delivered across the three waters system. These include failure to meet national and local environmental outcomes for fresh water, housing infrastructure supply being unable to meet demand in high growth areas, a constrained ability to plan and fund robust systems to cope with climate change, emergencies and natural hazards, and limitations on developing the regions[76].

Meeting expectations for future growth and make the necessary performance improvements to current infrastructure to achieve regulatory river quality targets requires a new approach.

Unless there is a sub-regional approach to three waters management and delivery, the evidence suggests that critical infrastructure performance and capacity improvement upgrades will be unaffordable and undeliverable given existing resources.

A sub-regional approach will mean available funding is able to deliver greater impact through shared resources, consistent, innovative and sustainable procurement, and operational efficiency processes.

74 Future Proof Strategy, Planning for Growth (2017), Appendix 1 – Allocation and Staging of Growth: Detailed Tables. UoW Medium population forecasts used.

75 DIA, April 2018. Review of three waters infrastructure: key findings and next steps, retrieved 03 October 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Review-of-three-waters-infrastructure-key-findings-and-next-steps-April-2018-a.pdf

76 DIA, April 2018. Review of three waters infrastructure: key findings and next steps, retrieved 8 August 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Review-of-three-waters-infrastructure-key-findings-and-next-steps-April-2018-a.pdf

3.2 Opportunities

The major opportunities that can be realised through the development of a Waikato sub-regional three waters approach relate to improving river water quality, improved infrastructure quality, operating efficiencies and planning, enabling future population growth and realising the economic potential of the sub-region.

3.2.1 River restoration opportunities

There is a special relationship between Waikato River iwi and the river, which is reflected in *Te Ture Whaimana*. Many of Waikato's communities also have strong connections to rivers in the region. An opportunity exists to strengthen these relationships by contributing to the restoration of the health and wellbeing of the Waikato River (through reducing contaminant loading) and increasing the number of customary, recreation and education interactions along its length and in the wider catchment.

Appropriate three waters servicing provisions and land use planning and development practices will contribute toward achieving *Te Ture Whaimana*. However, investment in three waters servicing practices alone will not achieve *Te Ture Whaimana*. It will require wider catchment land use management changes and restoration investment. The three waters project will inform and be informed by the spatial planning, blue-green corridor and environmental markets work streams being delivered through the corridor plan. This project, in combination with these work streams, provides the opportunity to identify and prioritise restoration and enhancement investments that may deliver the greatest benefit to the river, the most progress toward "restoring the health and wellbeing of the awa", and support growth and economic prosperity within the sub-region.

This work may identify centralised investment in large scale restoration and enhancement initiatives in combination with application of good practice as the most effective approach to accelerate progress toward achieving *Te Ture Whaimana*.

Achieving *Te Ture Whaimana* will mean the health and wellbeing of the Waikato and Waipā rivers is restored and protected for current and future generations, so that it is safe to swim in and take food from its entire length. Greater social, environmental and economic wellbeing can also be achieved through improved environmental outcomes. The Waikato River will be in suitable condition to reflect its place as the heart of the sub-region.

3.2.2 Infrastructure and resourcing opportunities

The state of three waters infrastructure and Waikato River water quality varies greatly in the Waikato sub-region. Local authorities, iwi, communities and industry face significant challenges in meeting current and future three waters service needs efficiently, while promoting Best for River outcomes. However, significant opportunities also come with these challenges, including economies of scale, greater network resilience and the opportunity for project partners to set strong environmental examples.

In 2015, the (economies of scale) operational cost saving for adopting a holistic Waikato sub-regional approach for the management of three waters infrastructure was estimated at around 10 per cent or $91 million net present value (NPV) over a 28-year period when compared to business as usual activities[78]. Cost efficiencies could be achieved through lower operating costs, savings in capital expenditure and innovative procurement strategies. Specific savings would depend on actual size of communities, scope of services, infrastructure spend, distances, technologies and state of existing infrastructure. The cost efficiencies realised through this approach could be utilised to expedite progress towards Best for River outcomes to improve river water quality issues to benefit the sub-region.

Further opportunities exist to improve overall network resilience. As outlined, the condition of three waters infrastructure in the study area varies across assets and the three councils. If greater collaboration and resource sharing is achieved, funding and resources could be shared and targeted at areas of the network that are most at risk of failure. Approaches that provide backup water servicing solutions could also be explored or implemented. This in turn will minimise the likelihood of negative environmental and community health and safety impacts.

Consent noncompliance and available discharge consent headroom are also issues in the Waikato catchment. Additionally, the impacts that urban stormwater and drainage discharges have on the sub-regional waterways is now being better recognised[79]. There is an opportunity to improve the performance of infrastructure to satisfy consent conditions, provide consent consistencies and improve river water quality. It is also a good opportunity for councils to model compliant and environmentally sustainable behaviours. If this occurs, it could act as a driver for the community to support stormwater educational campaigns and increase their uptake of sustainable water practices.

77 Outcome statement and principles for implementing Te Ture Whaimana – the Vision and Strategy for the Waikato and Waipa Rivers, July 2015.

78 Cranleigh Corporate Finance and Advisory, May 2015. Business Case for Water Services – Delivery Options: Part B Detailed Report, Pg. 41, https://web.archive.org/web/20190204173751/http:/www.waterstudywaikato.org.nz/uploads/files/Part%20B%20-%20Final.pdf (CCO Option)

79 Source: Below sourced from the Waikato Sub-Regional Waters Investigation - Terms of Reference - DRAFT Rev 1.2 - 2019-04-11 (002)

3.2.3 Future growth opportunities

Three waters infrastructure is a key requirement to unlock growth considerations when evaluating land use proposals for both residential and non-residential activities. The Waikato Three Waters Sub-Regional Project presents a unique opportunity for integrated and proactive infrastructure led planning in high growth areas that can lead to long run operational efficiencies, sustainable development and economic growth.

Substantial growth pressure exists in the Hamilton to Auckland corridor. This corridor is nationally significant, and investment is required to unlock its development potential.

Both the Hamilton-Waikato metropolitan area and the river communities spatial planning initiatives are being delivered through the *Hamilton to Auckland Corridor Plan*. This presents an unprecedented opportunity to directly influence further development of the Waikato region through an integrated catchment based approach which can deliver Best for River outcomes.

The absence of a clear understanding of the infrastructure needed to unlock land use development would perpetuate the historic and often siloed approach to land use planning which has resulted in many of the problems identified in this strategic case. It can also result in decisions supporting development in places where the cost of providing three waters services outweighs any benefit.

The wider benefits of the *Hamilton to Auckland Corridor Plan* that will be supported by the Waikato three waters sub-regional approach include:

- satisfying Best for River outcomes with efficient three waters plant and infrastructure planning
- unlocking the growth and economic development potential of the corridor guided by wāhi toitū, wāhi toiora (places with enduring presence to grow only with great care)
- increased community employment opportunities to foster 'work-live-play' principles
- maximising and delivering the greatest value for any investments made
- greater opportunities for alternative funding sources to provide sub-regional three waters services to satisfy regional growth pressures and achieve the *Hamilton to Auckland Corridor Plan* development aspirations.

There are many specific opportunities for improved three waters infrastructure service delivery, and more holistic and integrated urban planning approaches in the study area that arise from the Hamilton to Auckland corridor project. In addition, there have been several recent projects and development proposals that further support the adoption of a sub-regional three waters approach in the Waikato River catchment. These represent specific project opportunities that could be unlocked through a sub-regional three waters approach. Each is outlined below.

3.2.4 Case study opportunities

- **The Cambridge wastewater treatment plant upgrade**: A sub-regional approach would meet Best for River objectives and service growth within the Cambridge catchment area, the southern Hamilton area and Hamilton Airport commercial and industrial property park, as well as unlock greater residential development within Hamilton City's Peacocke's development. Diverting flow from the south end of Hamilton away from the Pukete WWTP provides the potential to release capacity and extend the area serviced by Pukete (possibly to unserviced land in Te Kōwhai and other areas to the north of Hamilton) and provide for wet industry activities.
- **Planning for wet industry activities**: This would create an environment that encourages, enables and supports water use and reuse innovation through water recycling and reuse for non-potable activities. This could potentially involve sharing sub-regional allocations of consented capacity takes from the Waikato River.
- **Proposed development at Ohinewai**: Offers the potential to unlock development opportunities by enabling sub-regional infrastructure to support such developments while accommodating planned residential growth (at both Te Kauwhata and Huntly)

Further details about these opportunities and the potential benefits that could be unlocked through a sub-regional three waters service and delivery approach are in Appendix J.

3.3 The benefits of investing

The potential benefits of investing to address the three waters challenges in the Waikato sub-region are outlined below. All three benefit statements link with multiple problem statements as shown in the investment logic map in Appendix A.

3.3.1 Benefit statement 1 (45%)

River health and quality is enhanced and people's connection with the river is restored.

This benefit statement relates to:

- the need to work collaboratively towards achieving the goals and objectives of *Te Ture Whaimana*
- the need to improve the water quality of the Waikato River along its entire length, including reducing turbidity, *E.coli* bacteria and nitrogen and phosphorous contaminants present in the river
- improving people's connections, interactions and appreciation of the river, and increasing the length of the river that is suitable for swimming and safe collection of kai. The Waikato River and region's waterways can be used more actively and commonly for customary, recreation and education practices.

3.3.2 Benefit statement 2 (35%)

Commitment and dedication to a collaborative and integrated approach to land, water and community planning that is holistic, integrated, aligned with community aspirations and provides opportunities for involvement by the wider community.

This benefit statement relates to:

- the need for consistent decision making and agreed strategies for land use and three waters management across the sub-region
- the need for alignment and consistency between resource consent conditions and practices, and the need for environmental standards consistency for consenting requirements that reflect iwi strategic visions for water quality.

3.3.3 Benefit statement 3 (20%)

Deliver Best for River solutions and approaches for managing growth and resource sustainability.

This benefit statement relates to:

- the need to invest efficiently in existing and new three waters infrastructure to meet growth demands for appropriate land uses and improve the capacity and capability to efficiently manage associated waters infrastructure provisions
- the need to prioritise investments in the sub-region as a whole based on the condition and risk of assets, and offset maintenance and renewal costs through a reduction in reactive repair and maintenance costs
- the need to achieve national/regional standards and targets, and investment in infrastructure and servicing solutions that are energy efficient to deliver Best for River outcomes. There are strong linkages between this benefit and the targets and outcomes sought in the World Future Council's *Regenerative Cities* report:

Initiating comprehensive political, financial and technological strategies for an environmentally enhancing, restorative relationship between urban communities and the ecosystems from which they draw resources for their sustenance[80].

80 World Future Council, Oct 2010. Regenerative Cities Report. Retrieved 04 October 2019, from https://www.worldfuturecouncil.org/regenerative-cities/

3.4 Best for River definition

The investment logic mapping workshop, and confirmation of the problems and benefits of investing, determined that defining Best for River was a key aspect to be woven into the business case process. The current state and problem statement evidence demonstrates there is significant room for improvement in achieving water quality targets and objectives of *Te Ture Whaimana,* even in the last 10 years. To make progress towards current and proposed central and local government regulatory targets, the Best for River definition is a critical success factor to be considered in the future assessment of potential options of a Waikato Sub-Regional Three Waters Programme Business Case.

3.4.1 Best for River definition methodology

Two workshops held on 25 June and 5 September, 2019, sought to define what Best for River meant in the three waters context. The June workshop was framed around several pou/pillars, and stakeholders used photographs and statements to develop Best for River definitions for the Waikato River. The workshop input was reviewed and reframed to be directly aligned with, and measured against, the objectives of the *Te Ture Whaimana*. The objectives of the *Te Ture Whaimana* were grouped by theme and Best for River definitions were assessed against their ability to give effect to those objectives (see figure 11).

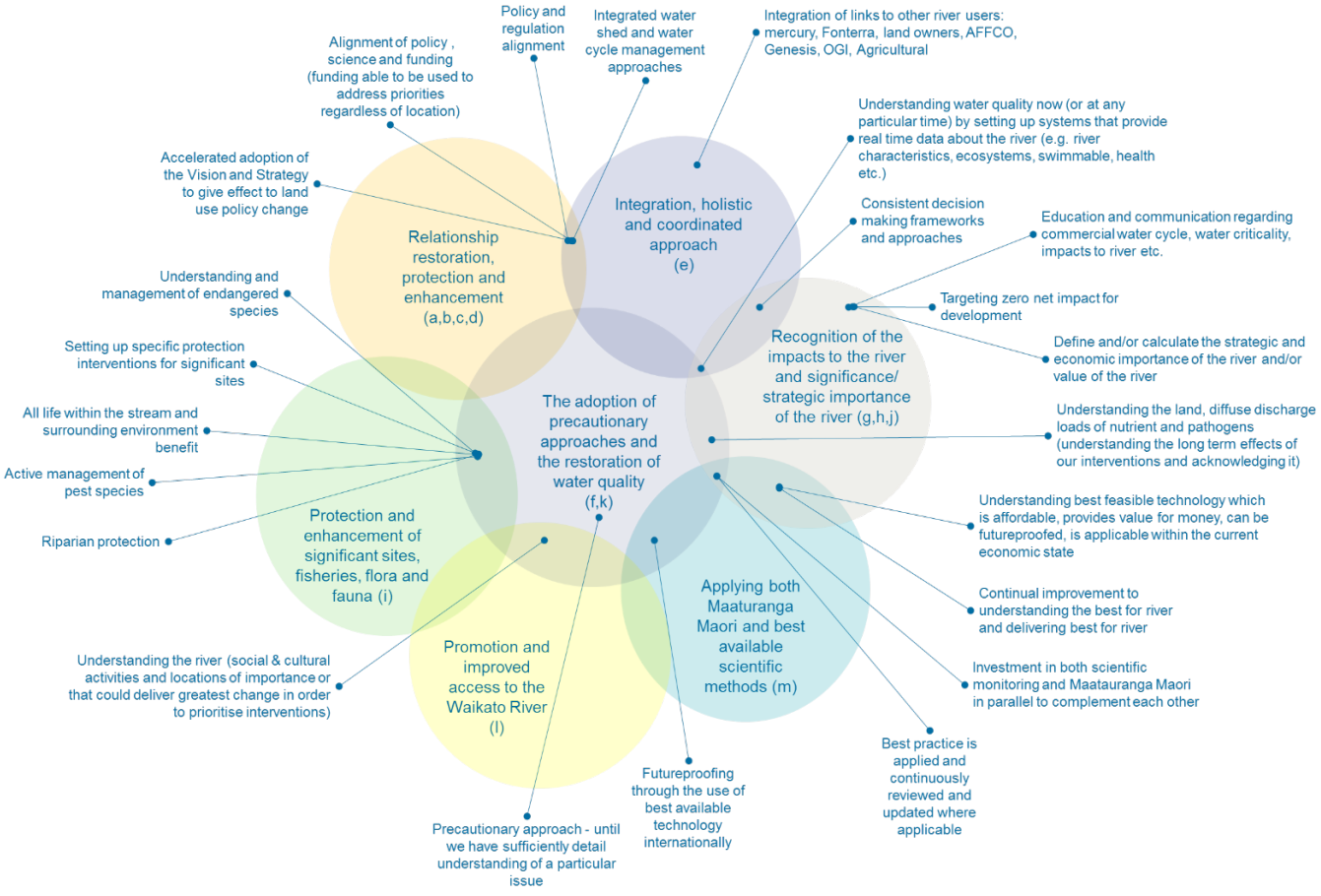


Figure 11 - Best for River definition statements and their alignment with Te Ture Whaimana o Waikato – the Vision and Strategy for the Waikato River [81]

Given the significance of both the Best for River definition as a key project outcome and *Te Ture Whaimana* as a key guiding strategy for this business case, a Best for River methodology was used to develop a set of project investment objectives and key performance indicators to ensure alignment between the strategic business case, the Best for River definition and *Te Ture Whaimana.*

A diagram showing how the Best for River definition and *Te Ture Whaimana* underpin the business case process is shown in figure 12, over the page.

81 Note: Best for River definition statements are displayed around the outside of the Venn diagram. Te Ture Whaimana objectives are grouped by theme and shown in the shaded circles. The lines between the Best for River definition statements and the Te Ture Whaimana objectives demonstrate the linkages between the two.

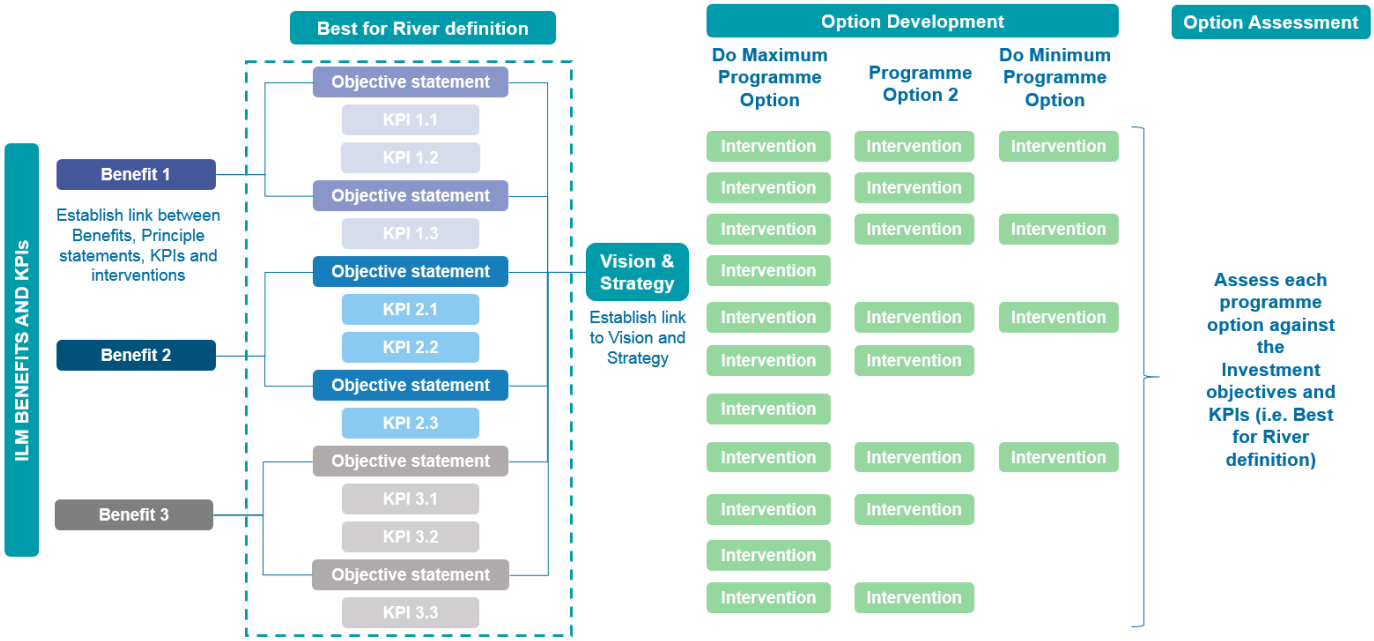


Figure 12 - Best for River methodology

Using this process, the Best for River definition informs the development of the project objective statements and key performance indicators. The project objective statements link to the objectives of *Te Ture Whaimana.*

3.4.2 Draft objectives and key performance indicators

The draft investment objectives and key performance indicators developed for this project, and using the methodology in figure 12, are in table 5 below. These objectives will be used to assess the effectiveness and strategic fit of each programme option at the long list assessment stage of the process in phase 2.

Table 5 - Draft objectives and key performance indicators

Draft objectives	Draft KPIs/measures
1. The whole of river water quality is improved.	KPI 1.1: Length of river that is suitable for swimming and safe for kai collection and consumption. KPI 1.2: Level of contaminants in river (particularly nitrogen and phosphorous). KPI 1.3: Abundance of mahinga kai and cultural resources. KPI 1.4: Eutrophic state of Waikato lakes.
2. All life within the stream and surrounding environment benefit.	KPI 2.1: Length of the river that is safe for the collection of kai across all flow ranges. KPI 2.2: Number and variety of native aquatic life in the river. KPI 2.3: Area coverage of native riparian vegetation surrounding river banks. KPI 2.4: Public health risks caused by poor river/water quality (E. coli measure).
3. Communities understand and are committed to caring for and protecting the river.	KPI 3.1: Number of industries which are actively engaged in river enhancing activities. KPI 3.2: Public awareness of river impacts and river enhancement technologies – community surveys. KPI 3.3: Number of schools which are actively engaged in river enhancing activities. KPI 3.4: Areas of planting carried out by community groups and landowners in the highest priority areas.

4. Cultural connectivity with the river is restored and enhanced.	KPI 4.1: Mātauranga Māori Cultural Health Index. KPI 4.2: Accessibility by marae and iwi to waterways, lakes and wetlands. KPI 4.3: Proportion of tribal members who engage in cultural and customary practice linked to awa. KPI 4.4: Number of waiata, haka, karakia linked to taiao in traditional and contemporary context. KPI 4.5: Identification and protection of sites of significance and wāhi tapu.
5. Improve access to the Waikato River to better enable sporting, recreational and cultural opportunities.	KPI 5.1: Number and quality of access points to the river for cultural and recreational activities. KPI 5.2: Number of regular annual sporting, recreational and cultural events held on the river and lakes. KPI 5.3: Number of participants in national and international events held of the river and lakes.
6. All water and land resource policy, regulations and decision making frameworks across the catchment are consistent and fully aligned to achieve the V&S, including RMA instruments, catchment-based management approaches.	KPI 6.1: Local authorities can demonstrate they are giving effect to the Te Ture Whaimana in all activities (e.g. planning instruments, consent conditions, funding prioritisation). KPI 6.2: Co-governance, decision making arrangements as part of settlement arrangements are given effect to (i.e. joint management agreements). KPI 6.3: Quality and consistency of consent conditions and enforcement of consent conditions. KPI 6.4: The number of private plan changes that are inconsistent with the Future Proof growth strategy or other relevant regional planning strategies.
7. All river and land management decisions are based on robust and comprehensive knowledge and understanding of the river system, including real time and long term data, sites of significance, social and cultural activities.	KPI 7.1: Increase data capture and reporting efficiencies. KPI 7.2: Optimisation of the existing data capture and monitoring systems. KPI 7.3: Investment into research regarding the impact and significance of river.
8. Achieve net benefit to the environment.	KPI 8.1: Fresh water indicators (as per Ministry for the Environment) including: nitrogen, phosphorous, E.coli, clarity, macroinvertebrate communities, groundwater quality, streambed sedimentation, trends in freshwater fish and pests, estimated long term soil erosion. KPI 8.2: Bio-diversity. KPI 8.3: Cultural health indicators. KPI 8.4: Water, carbon and energy accounting.
9. Increase the efficient use of resources and maximise resource recovery and contribution toward carbon neutrality and energy neutrality.	KPI 9.1: Reduction in the costs of reactive maintenance and repair. KPI 9.2: Increased investment in infrastructure and service solutions which promote energy efficiency technologies.
10. Apply and maintain best practice to all three waters management and infrastructure which allows for the sustainable future growth of the Waikato region.	KPI 10.1: Investment in three waters existing and new infrastructure is appropriately future proofed. KPI 10.2: Number of growth and development opportunities that can be serviced and are water positive and energy positive. KPI 10.3: Investment in three waters existing and new infrastructure is appropriately future proofed. KPI 10.4: Number of growth and development opportunities that can be serviced and are water positive and are energy positive. KPI 10.5: Number and extent of development that can demonstrate application of MfE Urban Water Principles.

4. Desired outcomes

The desired outcomes sought from resolving the problems and achieving the benefits were articulated by stakeholders in an **investment logic mapping** (ILM) workshop. The desired outcomes that resonated the most with stakeholders centred on the ideas of:

- adopting a Best for River and whole of river approach to water resources management
- supporting and enabling growth and economic development in the sub-region
- ensuring the health and wellbeing of our communities, including meeting public health obligations
- collaborating to achieve best outcomes for the river and people of the sub-region.

Best for River outcomes emerged as a central benefit and key driver of the *Waikato Three Waters Sub-Regional Strategic Business Case*. The importance of this benefit is reflected by the use of the Best for River concept to develop project objective statements for the business case. This benefit was defined further by stakeholders at a Best for River workshop where desired Best for River outcomes included the:

- preservation and restoration of the natural state of the river so it can be used for recreational and food purposes
- fostering and maintaining a healthy relationship between people and the river, and with each other
- increased intergenerational linkages to the awa, interaction and learning about the awa, and communities coming together to increase their water literacy.

Stakeholders favoured the collage of images displayed in figure 13 when expressing their desired outcomes for the future of water and the river in the Waikato sub-region.

Figure 13 - Waikato three waters stakeholders' most favoured future state images of the Waikato River[82]

All future project options will need to show that they can deliver on the outcomes identified above, as well as being consentable, affordable, fundable and sustainable.

The image of the confluence of two rivers (the Waikato and Waipā rivers) was symbolic of the need for partnership and collaboration between all parties across the entire Waikato and Waipā river catchments in order to achieve *Te Ture Whaimana*.

82 Note: The image displaying the convergence of the Waikato and Waipa rivers was favoured as it represents the health of the relationship of people with the river – and with each other: Crown / Maori relationship

5. Possible strategic responses

Possible strategic responses to achieve the benefits of a sub-regional three waters service, the Best for River definition/objectives and resolve challenges were identified by stakeholders in a technical long list option workshop on 23 July, 2019. Potential infrastructure options were also identified. A full list of the initial long list options identified by stakeholders is in Appendix K.

All strategic responses demanded an increased level of collaboration between project partners. The options were grouped in the following themes: planning, procurement, RMA processes, asset ownership vehicles and technical resourcing.

There was a general understanding that Best for River outcomes, NPS-FM and proposed plan change 1 targets and development aspirations were more likely to be achieved under a collaborative three waters management approach as opposed to the current, largely individualised territorial authority approach.

5.1 Collaborative planning

A Waikato sub-regional planning programme could be made up of a range of collaborative measures. Some of the collaborative planning options identified to achieve sub-regional development aspirations and Best for River outcomes are as follows.

- Utilise sub-regional and cross boundary (territorial authority) water supply and wastewater treatment facilities to service areas of growth.
- Plan land use collectively at a sub-regional level and reflect the sub-regional land use strategy in individual district plans.
- Adopt common planning practices and alignment of district plans.
- Use consistent planning rules across the region, baseline population projections and consistent assumptions.
- Inform zoning and spatial planning at a sub-regional level to make the best use of the land.
- Provide wide riparian areas, greenspace and blue-green corridors throughout the sub-region along the Waikato River for stormwater and land use diffuse purposes.
- Strategically (non-developer) located wet industry hubs and dedicated areas with appropriate infrastructure.
- Acknowledge that some areas in the sub-region should not be developed at all.

5.2 Collaborative procurement

Procurement of three waters infrastructure and services at a sub-regional level was identified as a potential strategic response. Specific collaborative procurement interventions to achieve investment benefits are:

- councils share technical resources and co-fund three waters infrastructure to service multiple jurisdictions
- align procurement policies, targets and processes to increase overall investment impact and create shift in the marketplace away from only economic considerations to greater overall impact
- the ability to use centralised or alternative (such as public-private partnerships) funding mechanisms
- adopt a catchment-wide programme of prioritised works, including environmental investment prioritisation
- implement supply chain controls
- standardise and/or subsidise plant upgrades
- adopt holistic stormwater solutions through constructed systems for the catchment
- procure and supply consumers with reuse tanks to help offset regional peak water demand
- provide education programmes about the domestic and commercial water cycle, water criticality and value.

5.3 RMA processes

The streamlining of RMA processes between territorial authorities in the Waikato sub-region was another high-level response identified in the development of this business case. A list of potential interventions that may achieve better outcomes include:

- agreeing and enforcing standardised consent compliance requirements across the three councils of the Future Proof sub-region
- agreeing targets for river water quality and working collaboratively to regularly monitor progress toward these targets
- applying regional-based municipal water allocation and wastewater discharge consents
- establishing consistent sub-regional policy for high-water users
- reducing wastewater discharge volumes into the river through demand management interventions and resource and water reuse and recycling
- nominating an owner for the river that has an integrated view of three waters services and the Waikato River catchment as a whole
- the adoption of potable water demand management measures across the sub-region.

5.4 Asset ownership vehicles and alternative service delivery mechanisms

Varying degrees of asset ownership vehicles to maintain three waters infrastructure and manage service delivery to consumers was another theme to be considered. Options to deliver sub-regional facilities and improve outcomes include but are not limited to:

- adopting an integrated and centralised approach to sub-regional three waters service provision and delivery, e.g. the co-management of three waters services by an integrated delivery mechanism
- adopting an integrated, alternative approach to sub-regional three waters service delivery, e.g. the expansion of the Waikato Local Authority Shared Services (WLASS) service procurement mechanism
- using an integrated rating system for sub-regional three waters delivery
- opportunities for public/iwi partnerships to deliver, own and operate sub-regional three waters facilities
- voluntary water service management change to improve overall water management
- changing to a three waters governance model
- development contribution rationalisation.

5.5 Sub-regional technical resourcing

The skills and technical capabilities of council three waters resources vary across the Waikato sub-region. A potential response is for Hamilton city, Waikato and Waipā district councils to share three waters technical resources and staff. Specific options that might achieve this include:

- sharing available three waters technical resources and expertise among the councils delivering services in the Waikato sub-region via secondments or forming sub-regional team offices
- shared data capture and collection, and aligned metadata
- training and upskilling of existing three waters staff to optimise capability
- structural change or formation of an entity to attract technical expertise for the benefit of the sub-region.

This type of shared resourcing approach has been proposed by WLASS via the extension of the current regional asset technical accord (RATA) collaborative group to include three waters. About eight to nine councils from within LASS, including Hamilton and Waipā (however, not Waikato DC), are involved in RATA. A business case has been accepted by the chief executives' forum for this proposal to be implemented and there is endorsement of the initiative by local government Minister Nanaia Mahuta. The proposed funding agreement is currently under review prior to signing.

6. Next steps

This strategic case presents a compelling case for change in land use planning and three waters infrastructure servicing approaches. This change is needed to achieve innovative, responsive and timely infrastructure solutions which deliver better environmental outcomes, community benefits and overall efficiencies and resiliency.

Delivery of a programme level business case for three waters infrastructure across the Waikato Sub-Region is the key deliverable for Phase 2 of the project. The Programme Business Case will map a long list of options and identify a short list of options for further detailed investigation. The Programme Business Case will identify key asset and non-asset based projects and activities needed to achieve the programme vision and objectives.

Phase 2 of the project will continue to be developed and delivered through collaborative decision making and collective endorsement of approaches taken and deliverables by the project partners. Phase 2 will also include broader stakeholder engagement. Funding for phase 2 will be sought from Future Proof partners, central government and other key stakeholders. A funding application to central government to support phase 2 is currently being progressed.

References

NZ Treasury 2018 - https://treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/better-business-cases-bbc/bbc-framework-and-annual-budget-process

United Nations 2018 - https://www.un.org/en/events/waterdecade/index.shtml

Waikato Regional Council, 2019 - WAIKATO REGIONAL PLAN CHANGE 1 – WAIKATO AND WAIPĀ RIVER CATCHMENTS, Section 32 Evaluation Report Section A2.3.2

Waikato Regional Policy Statement, Section 12. Retrieved, 29 October 2019, from https://www.waikatoregion.govt.nz/Council/Policy-and-plans/Regional-Policy-Statement/Regional-Policy-Statement-Review/Section32/2/2-3/

Future Proof Partners, 2019. Three Waters Strategy. Retrieved 29 August 2019, from http://www.futureproof.org.nz/the-strategy/three waters-strategy/

WLASS, 2019. Waikato Local Authority Shared Services Limited, About Us. Retrieved 24 September 2019, from https://waikatolass.co.nz/about-us/

MfE, 2019. Source: https://www.mfe.govt.nz/fresh-water/national-policy-statement/developing-2014-nps

MfE, 2019. Action for Healthy Waterways Summary. Retrieved 27 September 2019, from https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/action-for-healthy-waterways-summary.pdf

Wynn Williams, 2019. Fresh plans for freshwater – Government proposes reform. Retrieved 27 September 2019, from https://www.wynnwilliams.co.nz/Publications/Articles/Fresh-plans-for-freshwater-%E2%80%93-Government-proposes-r

Tomkins Wake. Plan Change 1 to the Waikato Regional Plan –Healthy Rivers Implications for farming. Retrieved 28 August 2019, from https://www.planning.org.nz/Attachment?Action=Download&Attachment_id=4310

Waipā District Council, Waikato District Council and Hamilton City Council Long-term Plans 2018-28

DIA, Nov 2017. Review of the three waters infrastructure services: Initial key findings for discussion with the Minister of Local Government. Retrieved 16 July 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Review-of-three-waters-infrastructure-services-key-findings-November-2017.pdf

Future Proof Strategy, Planning for Growth (2017), Appendix 1 – Allocation and Staging of Growth: Detailed Tables. UoW. Total population is the sum of the territorial authority populations of Waikato District Council, Hamilton City Council and Waipā District Council.

Department of Internal Affairs, September 2018. Three Waters Review: Cost Estimates for upgrading Wastewater Treatment Plants to meet Objectives of the NPS Freshwater Final Report, 3.2.3 Summary of WWTPs discharging to freshwater, Table 3 and 4, page 15.

BECA, GHD, Oct 2019. Current State Report, GIS Maps: HCC, GHD, August 2019. Audit Compliance Wastewater Treatment Plant.

Waikato District Council, Presentation by Bill Vant, 25 June 2019.

WRC, 2019. How clean is the Waikato River? Water quality for plants and animals, retrieved 15 July 2019, from https://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Rivers/Waikato-River/How-clean-is-the-Waikato-River/

WRC, 2019. Map 2: Project Watershed Management Zones. Retrieved 30 August 2019, from https://www.waikatoregion.govt.nz/Council/Policy-and-plans/Hazard-and-catchment-management/Level-of-Service-and-Funding-Policy/10/Map-2/

Waikato Regional Council Monitoring Sites: Waikato River Water Quality Monitoring Programme (WARIMP), Plan Change 1, NPS 2017.

Land and Water Aotearoa, 2019. Retrieved 29 July 2019, from https://www.lawa.org.nz/explore-data/waikato-region/river-quality/waikato-river/

Water New Zealand National Performance Review (2017-2018). Retrieved 21 August 2019, from https://www.waternz.org.nz/Category?Action=View&Category_id=999

Cranleigh Corporate Finance and Advisory, May 2015. Business Case for Water Services – Delivery Options: Part B Detailed Report, Pg. 20, https://web.archive.org/web/20190204173751/http:/www.waterstudywaikato.org.nz/uploads/files/Part%20B%20-%20Final.pdf

WRC, 2017. Waikato Freshwater Strategy1.7.1 Policy Tools No Longer Fit For Purpose, page 18. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

WRC, April 2012. Proposed Waikato Regional Plan, Variation No.6 – Water Allocation, Operative (10April 2012), Policy 7, page 17. Retrieved 21 August 2019, from http://www.waikatoregion.govt.nz/assets/PageFiles/7062/n2141102_v1_OPERATIVE_version_-_Variation_No__6March2012.pdf

WRC, April 2012. Proposed Waikato Regional Plan, Variation No.6 – Water Allocation Operative (10 April 2012), Page 21. Retrieved 21 August 2019, from http://www.waikatoregion.govt.nz/assets/PageFiles/7062/n2141102_v1_OPERATIVE_version_-_Variation_No__6March2012.pdf

Environment Waikato, 2007. Project Brief: Effects of Land Use Change on the Flood Hydrology of the Waikato River Catchment Between Karapiro and Taupo, Retrieved 31 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/10839/projectbriefeffectslanduse.pdf

Future Proof Partners, 2019. Sub Regional Three Waters Study, Audit Compliance, Wastewater Treatment Plants. 13 August 2019

WRC, 2019. Frequently asked questions Dairy shed water takes. Retrieved 20 August 2019, from https://www.waikatoregion.govt.nz/assets/WRC/Services/regional-services/consents-and-compliance/water-takes/2252386-FAQ.pdf

WRC, 2019. Water Allocation Levels. Retrieved 21 August 2019, from http://waterallocation.waikatoregion.govt.nz/levels

WRC, July 2017. Waikato Freshwater Strategy Te Rautaki Wāimaori Mō Waikato, Page 7. Retrieved 21 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

WRC, 2019. Waikato River water quality monitoring sites. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/environment/natural-resources/water/rivers/waikato-river/map/

DIA (Beca), March 2018. Cost Estimates for Upgrading Water Treatment Plants to Meet Potential Changes to the NZ Drinking Water Standards. Retrieved 22 August 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Beca-report-Cost-Estimates-for-Upgrading-Water-Treatment-Plants.pdf

DIA (GHD, Boffa Miskell), Sept 2018. Cost Estimates for Upgrading Wastewater Treatment Plants to meet objectives of the NPS Freshwater. Retrieved 22 August 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-documents/$file/Costs-of-wastewater-upgrades-GHD-Boffa-Miskel-Final-report-Oct-2018.pdf

WRC, July 2017. Waikato Freshwater Strategy, 1.7.3 Policy Misalignment. Retrieved 22 August 2019, from https://www.waikatoregion.govt.nz/assets/PageFiles/40487-lets-talk-water/Fresh-water-strategy-2017-COMBINED-web.pdf

Future Proof Partners, 2019. Sub Regional Three Waters Study, Water Supply Drinking Water Standards Compliance. 27 September 2019

Future Proof Partners, 2019. Sub Regional Three Waters Study, Audit Compliance, Wastewater Treatment Plants. 27 September 2019

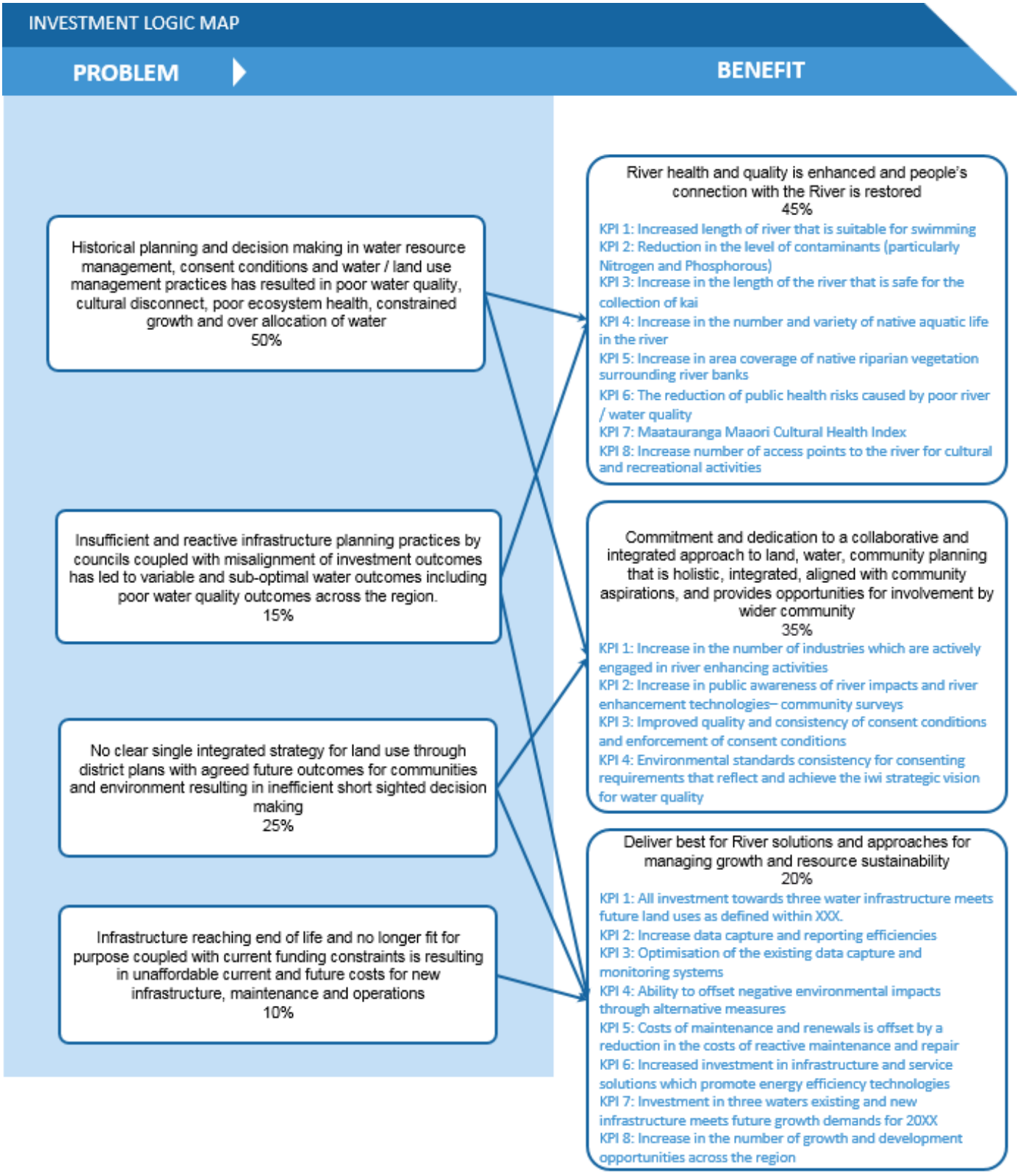
WaterNZ, 2017/18. Percentage of water pipelines assessed as poor or very poor condition, Stormwater. Retrieved 29 July 2019, from https://www.waternz.org.nz/Category?Action=View&Category_id=1008

MfE, 2019. Action for Healthy Waterways Summary. Retrieved 27 September 2019, from https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/action-for-healthy-waterways-summary.pdf

DIA, April 2018. Review of three waters infrastructure: key findings and next steps, retrieved 03 October 2019, from https://www.dia.govt.nz/diawebsite.nsf/Files/Three-Waters-Review-Cabinet-papers-April-2018/$file/Review-of-three-waters-infrastructure-key-findings-and-next-steps-April-2018-a.pdf

Appendices

Appendix A Investment logic map



Investor: Hamilton City Council – Jackie Colliar
Facilitator: GHD - Tim Eldridge
Accredited Facilitator: No – Accredited Business Case Practitioner

Version no: Draft Rev 2.0
Initial Workshop: 14 May 2019
Last modified by: Thomas Hankinson – 30 Sept 2019
Template version: 0.2

Appendix B Glossary of terms

Abbreviation	Description
BBC	Better Business Case
DEGS	District and Economic Growth Strategy
FDS	Future Development Strategy
H2A	Hamilton to Auckland Corridor
ILM	Investment Logic Map
NPS	National Policy Statement
NPS-FM	National Policy Statement for Freshwater Management
NPS-UDC	National Policy Statement on Urban Development Capacity
NPV	Net present value
RMA	Resource Management Act
RPS	Regional policy statement
SW	Stormwater
UGA	Urban Growth Agenda
WLASS	Waikato Local Authority Shared Services
WRC	Waikato Regional Council
WRP	Waikato Regional Plan
WTP	Water treatment plant
WWTP	Waste water treatment plant

Appendix C Alignment to key strategies

Strategy	Organisation	Description	Alignment
National Policy Statement for Freshwater Management 2014 (updated 2017)	Central government	The National Policy Statement for Freshwater Management 2014 (NPS Freshwater) sets out the objectives and policies for fresh water management under the Resource Management Act 1991.	This NPS supports a case for change in the areas of water quality, integrated management, tangata whenua and Te Mana o te Wai. It aims to safeguard life supporting capacity, ecosystems, indigenous species, health of people and communities, maintain or improve (where degraded) overall water quality for primary contact more often, and enable communities to provide for their economic wellbeing in sustainably managing fresh water quality within limit.
National Policy Statement on Urban Development Capacity 2016	Central government	The National Policy Statement on Urban Development Capacity 2016 (NPS-Urban Development Capacity) recognises the national significance of urban environments.[83] It directs local authorities to provide sufficient development capacity in their resource management plans, supported by infrastructure, to meet demand for housing and business space.	This NPS aligns with the case for change for collaborative and integrated approach to land, water and community planning, and the need for coordinated and responsive planning for decision-making. The statement highlights the need for reactive infrastructure planning to create urban environments that develop and change in response to changing needs of people and communities. It recognises outcomes of national significance including providing sufficient development capacity to meet the future needs of people and communities.

83 MfE, 2019. About the National Policy Statement on Urban Development Capacity. Retrieved 22 July 2019, from https://www.mfe.govt.nz/more/towns-and-cities/national-policy-statement-urban-development-capacity

Iwi management plans	Iwi	Iwi management plans are developed and approved by iwi to address matters of resource management activity of significance within their respective rohe (region). Tai Tumu Tai Pari Tai Ao Waikato-Tainui Environmental Plan, KO TA Maniapoto Mahere Taiao Maniapoto Environmental Management Plan 2016, Te Rautaki Taiao A Raukawa Rauwaka Environmental Management Plan 2015, and Ngāti Hikairo Heritage Management Plan 2010 reference the Waikato River or Waikato sub-region.	Tai Tumu Tai Pari Tai Ao Waikato-Tainui Environmental Plan calls for a collaborative and integrated approach to water resource management with the particular emphasis on Waikato-Tainui participation. It focuses on improving the natural environment to enhance community connection to the river while recognising the needs of local communities and industry. KO TA Maniapoto Mahere Taiao Maniapoto Environmental Management Plan 2016 aligns with the case for change in the areas of integrated management and planning of water resources, and the need to restore people's connection to the river. It aims to give direction to restore, maintain and protect the quality and integrity of the waters that flow and form part of the Waipā River for present and future generations. Te Rautaki Taiao A Raukawa Rauwaka Environmental Management Plan 2015 highlights the inexplicit link between people and the environment, and how social, environmental and economic wellbeing is dependent on the welfare of the environment. It calls for an integrated, holistic and coordinated approach to community involvement in the restoration and protection of the Waikato River. The Ngāti Hikairo Heritage Management Plan 2010 purpose is to provide information about how Ngāti Hikairo intend to work with various stakeholders to better manage areas of cultural and historical significance. The plan identifies the importance of preserving cultural landscapes and natural resources for the community, and to ensure iwi participation in planning.
Te Ture Whaimana o Te Awa Waikato – the Vision and Strategy for the Waikato River	Waikato River Authority	The vision calls for an integrated, holistic and coordinated approach to the management of the natural, physical, cultural and historic resources of the Waikato River. Also the restoration and protection of the health and wellbeing of the Waikato River.	The vision calls for an integrated, holistic and coordinated approach to the management of the natural, physical, cultural and historic resources of the Waikato River. Also the restoration and protection of the health and wellbeing of the Waikato River.
Waikato Regional Policy Statement 2016	Local government	The Waikato Regional Policy Statement (Te Tauākī Kaupapa here ā-Rohe) is a mandatory document that provides an overview of the resource management issues in the Waikato region, and the ways in which integrated management of the region's natural and physical resources will be achieved.	The Waikato Regional Policy Statement (Te Tauākī Kaupapa here ā-Rohe) promotes integrated management of natural and physical resources that recognises the values of water body catchments and the needs of current and future generations.
Waikato Regional Plan 2007	Local government	The Waikato Regional Plan contains policy and methods to manage the natural and physical resources of the Waikato region. The plan implements the Regional Policy Statement.	

Healthy Rivers/ Wai Ora: Proposed Waikato Regional Plan Change 1	Local government	The proposed plan change is a response to give effect to the Vision and Strategy for the Waikato River and the National Policy Statement for Freshwater Management 2014.	The proposed plan change focuses on restoring and protecting the health and wellbeing of the Waikato and Waipā rivers, to improve water quality and the community's relationship with the river. There is focus on integrated management to reduce contaminants from land and to support communities with education that enables appreciation of water improvements.
Future Proof Strategy 2017	Local and central government	Future Proof is a growth strategy specific to the Hamilton, Waipā, and Waikato sub-region and has been developed jointly by Hamilton City Council, Waikato Regional Council and Waipā and Waikato district councils, as well as tangata whenua, the NZ Transport Agency and Matamata-Piako District Council. The Future Proof growth strategy provides a framework for ongoing cooperation and implementation[84].	Future Proof Strategy 2017 outlines key guiding principles such as sustainable resource use, affordable and sustainable infrastructure, and the protection of natural environments, landscapes and the Waikato River. It supports the case for change in the areas of collaborative water resource management and efficient allocation of funding for infrastructure. Water allocation and quality is identified as a key issue, particularly for the Waikato River, and the strategy highlights the need to protect resources for future generations.
Future Proof Sub-Regional Three Waters Strategy 2012	Local and central government	The Sub-Regional Three Waters Strategy sets out how water, wastewater and stormwater will be managed over the next 50 years. It is an important part of the Future Proof growth strategy and encompasses three local council areas – Waikato district, Hamilton city and Waipā district[85].	This strategy highlights the need to protect the Waikato River to ensure social, economic and wellbeing needs of the community are met. It recognises the importance of water supply quality and quantity to enhance public health and the natural environment. The strategy aligns with the case for change in the areas of water quality enhancement and collaborative natural resource management to improve river health.
Hamilton to Auckland (H2A) Corridor Plan	Local and central government	This document provides a spatial plan to manage growth for the nationally significant Hamilton to Auckland Corridor. Twenty initiatives have been identified for the corridor of which three waters infrastructure is a key enabler.	The H2A Corridor Plan aligns with the sub-regional three waters investigation because it outlines an integrated three waters sub-regional strategy as being a key enabler to the other H2A Corridor Plan initiatives.

84 Sourced from http://www.futureproof.org.nz/page/46-what-is-future-proof

85 Sourced from http://www.futureproof.org.nz/page/86-three-waters-strategy

Waikato District Council Long Term Plan 2018-28	Waikato District Council	10 year spending plan for the council.	Waikato District Council LTP 2018-28 aims to create connected communities through fit-for-purpose infrastructure such as roads, cycleways, walkways and digital capabilities for people to access services and amenities. The 30 Year Infrastructure Strategy identifies water supply assets and options for managing issues over the next 30 years. The LTP aligns with a case for change in terms of collaborative community planning, integrated natural resource management and achieving water quality standards.
Waipā District Council 10-Year Plan 2018-28	Waipā District Council	10 year spending plan for the council.	The Waipā District Council 10-Year Plan 2018-28 supports the case for change in the areas of infrastructure funding and strategic planning to cater for future growth. Emphasis is placed on the importance of cost effective water supply to enable residential and business growth, the importance of compliance relating to water consents and maintaining level of service to comply with water quality standards.
Hamilton City Council Long Term Plan	Hamilton City Council	10 year spending plan for the council.	This plan identifies the need to embrace the natural environment and supply Hamilton with reliable, high quality and safe treated water supply. It highlights the importance of good quality water infrastructure to supply services that are safe, healthy and sustainable, and maintenance of infrastructure to enhance water quality, especially of the Waikato River.
Waikato Regional Council Long Term Plan	Waikato Regional Council	10 year spending plan for the council.	This LTP focuses on the importance of maintaining flood protection and land drainage assets which are essential in managing risks to communities associated with natural hazards, promoting economic productivity and contributing to community wellbeing. It aligns with the need for continued water infrastructure investment to manage future growth to ensure sustainable resource outcomes.

Note: The Waikato District Council is in the process of reviewing its District & Economic Growth Strategy which will be approved in early 2020

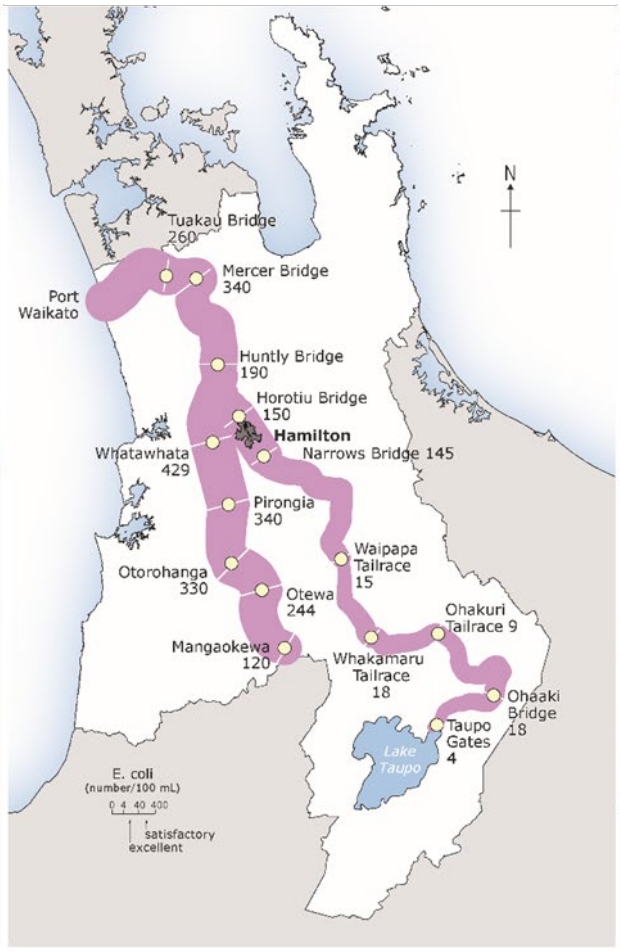
Appendix D Waikato River water quality monitoring sites/changes

Waikato River key water quality monitoring sites

86 WRC, 2019. Waikato River water quality monitoring sites. Retrieved 28 August 2019, from https://www.waikatoregion.govt.nz/environment/natural-resources/water/rivers/waikato-river/map/


N
Tuakau Bridge
1.02
Mercer Bridge
0.96
Port
Waikato
Huntly Bridge
0.90
Horotiu Bridge
0.69
Hamilton
Whatawhata
1.41
Narrows Bridge 0.68
Pirongia
1.23
Waipapa
Tailrace 0.46
Otorohanga
1.08
Otewa
0.53
Ohakuri
Tailrace 0.31
Mangaokewa 0.61
Whakamaru
Tailrace
0.38
Ohaaki
Bridge
0.15
Taupo
Gates
0.10
Lake
Taupo
Total nitrogen
(g/m³)
0 0.75 1.5
satisfactory
excellent

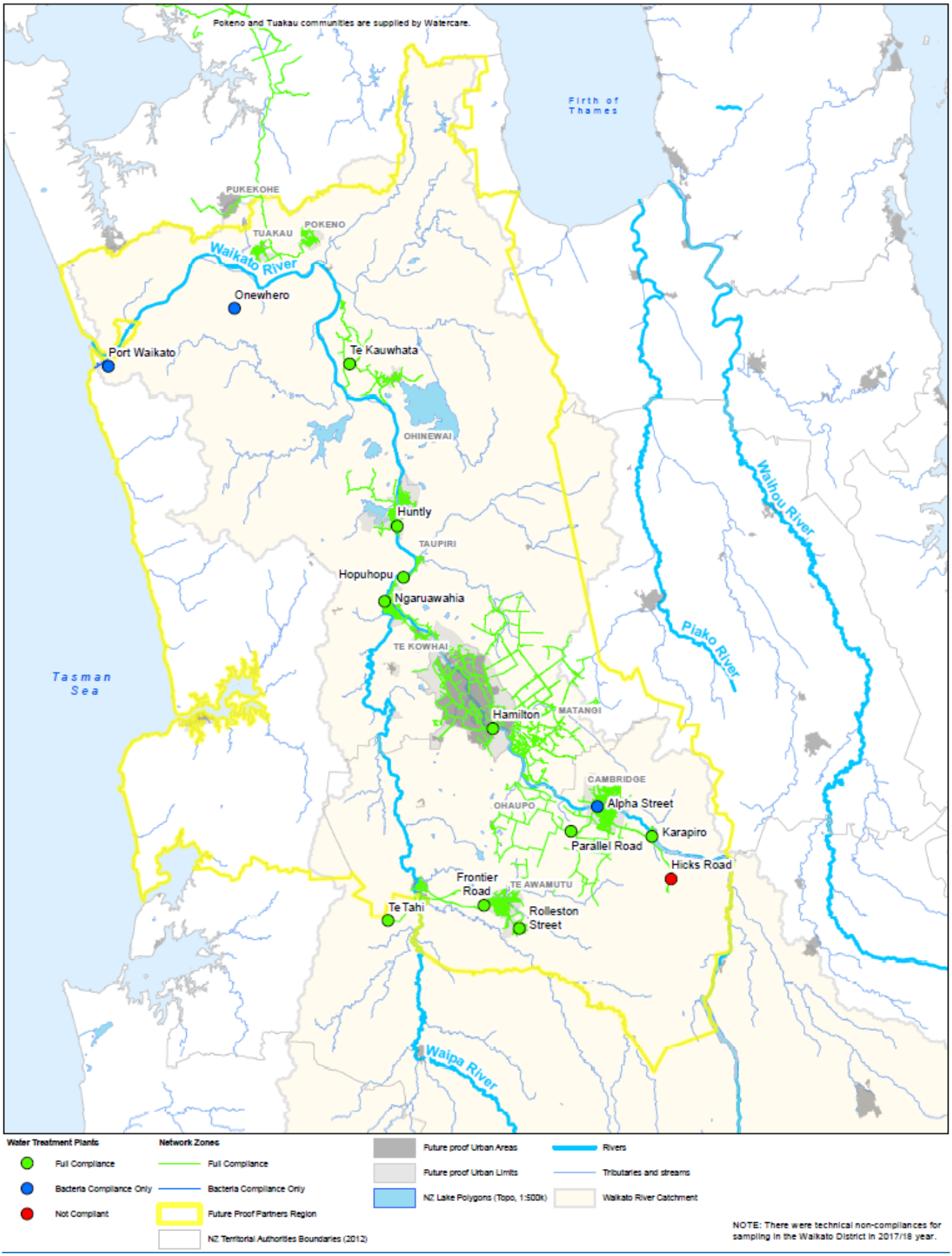

Tuakau Bridge
0.050
Mercer Bridge
0.053
Port
Waikato
Huntly Bridge
0.042
Horotiu Bridge
0.033
Hamilton
Whatawhata
0.093
Narrows Bridge 0.030
Pirongia
0.045
Waipapa
Tailrace
0.022
Otorohanga
0.016
Otewa
0.024
Ohakuri
Tailrace 0.021
Mangaokewa
0.014
Whakamaru
Tailrace
0.021
Ohaaki
Bridge
0.017
Taupo
Gates
0.003
Total phosphorus
(g/m³)
0 0.05 0.10
satisfactory
excellent


N
Tuakau Bridge
260
Mercer Bridge
340
Port
Waikato
Huntly Bridge
190
Horotiu Bridge
150
Hamilton
Whatawhata
429
Narrows Bridge 145
Pirongia
340
Waipapa
Tailrace
15
Otorohanga
330
Otewa
244
Ohakuri
Tailrace 9
Mangaokewa
120
Whakamaru
Tailrace
18
Ohaaki
Bridge
18
Taupo
Gates
4
Lake
Taupo
E. coli
(number/100 mL)
0 4 40 400
satisfactory
excellent


N
Tuakau Bridge
10.5
Mercer Bridge
9.0
Port
Waikato
Huntly Bridge
7.0
Horotiu Bridge
3.4
Hamilton
Whatawhata
20.3
Narrows Bridge 2.1
Pirongia
13.9
Waipapa
Tailrace 1.6
Otorohanga
5.4
Otewa
3.6
Ohakuri
Tailrace 1.3
Mangaokewa 2.2
Whakamaru
Tailrace
1.2
Ohaaki
Bridge
0.8
Taupo
Gates
0.4
Lake
Taupo
Turbidity
(NTU)
0 10 20
satisfactory
excellent

Appendix E Consent compliance[87]

Water treatment plants – drinking water compliance



87 Source: Waikato Three Waters Current State Report, September 2019.

Wastewater treatment plant discharge compliance

Appendix F LGA non-financial performance measures rules 2013 (three waters)[88]

Part 2 – Performance Measures

Sub-part 1 – Water supply

Performance measure 1 (safety of drinking water)

The extent to which the local authority's drinking water supply complies with:

a) part 4 of the drinking-water standards (bacteria compliance criteria), and

b) part 5 of the drinking-water standards (protozoal compliance criteria).

Performance measure 2 (maintenance of the reticulation network)

The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this).

Performance measure 3 (fault response times)

Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:

a) attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and

b) resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.

c) attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and

d) resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.

Performance measure 4 (customer satisfaction)

The total number of complaints received by the local authority about any of the following:

a) drinking water clarity

b) drinking water taste

c) drinking water odour

d) drinking water pressure or flow

e) continuity of supply, and

f) the local authority's response to any of these issues

expressed per 1000 connections to the local authority's networked reticulation system.

Performance measure 5 (demand management)

The average consumption of drinking water per day per resident within the territorial authority district.

Sub-part 2 – Sewerage and the treatment and disposal of sewage

Performance measure 1 (system and adequacy)

The number of dry weather sewerage overflows from the territorial authority's sewerage system, expressed per 1000 sewerage connections to that sewerage system.

88 DIA, 2013. Non-Financial Performance Measures Rules 2013. Retrieved 30th Sept, from https://www.dia.govt.nz/Resource-material-Our-Policy-Advice-Areas-Local-Government-Policy#performance-measures

Performance measure 2 (discharge compliance)

Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of:

a) abatement notices

b) infringement notices

c) enforcement orders, and

d) convictions,

received by the territorial authority in relation those resource consents.

Performance measure 3 (fault response times)

Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured:

a) attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, and

b) resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.

Performance measure 4 (customer satisfaction)

The total number of complaints received by the territorial authority about any of the following:

a) sewage odour

b) sewerage system faults

c) sewerage system blockages, and

d) the territorial authority's response to issues with its sewerage system,

expressed per 1000 connections to the territorial authority's sewerage system.

Sub-part 3 – Stormwater drainage

Performance measure 1 (system adequacy)

a) The number of flooding events that occur in a territorial authority district.

b) For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)

Performance measure 2 (discharge compliance)

Compliance with the territorial authority's resource consents for discharge from its stormwater system, measured by the number of:

a) abatement notices

b) infringement notices

c) enforcement orders, and

d) convictions,

received by the territorial authority in relation those resource consents.

Performance measure 3 (response times)

The median response time to attend a flooding event, measured from the time that the territorial authority receives notification to the time that service personnel reach the site.

Performance measure 4 (customer satisfaction)

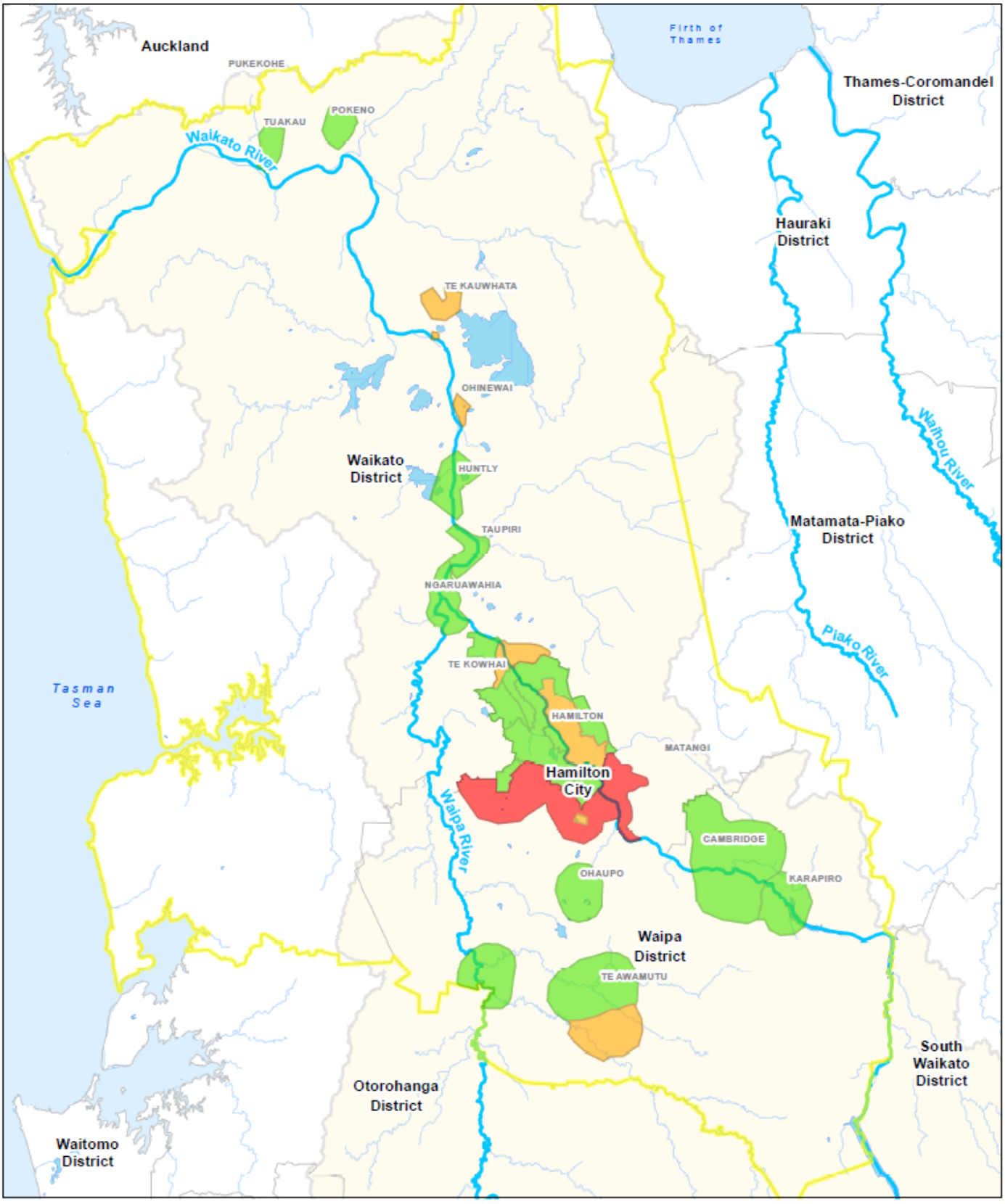
The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.

Appendix G Waikato River water quality and water quality targets[89]

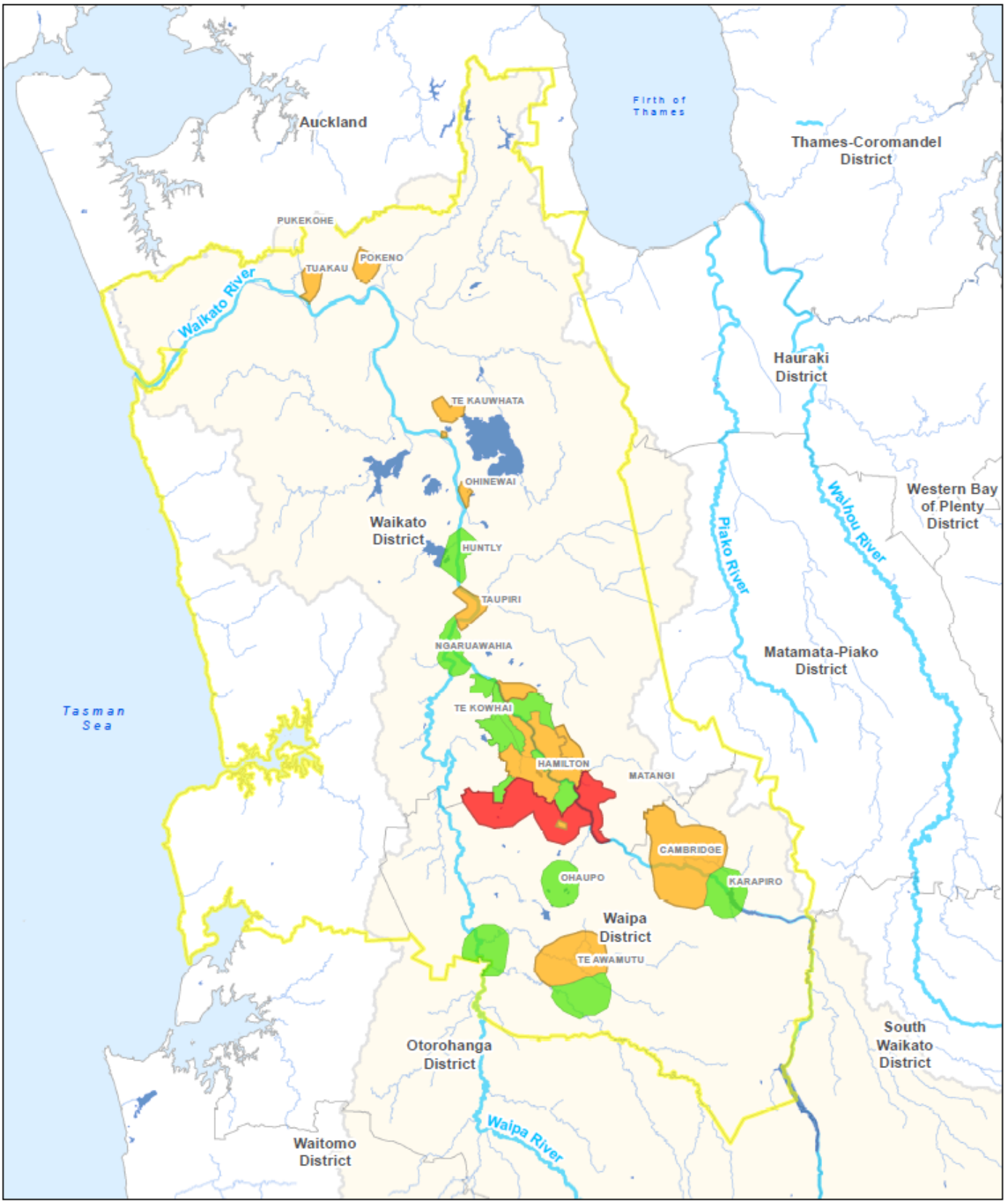
ParameterSource		Waikato River location			
		Upper river	Central river	Lower river	Lower river
Median total nitrogen (mg/m3)	LAWA data (2017)	356	680	690	1015
	Proposed plan change 1 – short term target	260	404	432	571
	Proposed plan change 1 – 80 year target	160	350	350	350
	NPS target attribute A	≤160	≤160	≤160	≤160
	NPS target attribute B	>160 and ≤ 350	>160 and ≤ 350	>160 and ≤ 350	>160 and ≤ 350
	NPS target attribute C	>350 and ≤ 750	>350 and ≤ 750	>350 and ≤ 750	>350 and ≤ 750
	NPS national bottom line	750	750	750	750
Median total phosphorus (mg/m3)	LAWA data (5 year median)	21	29	33	47.5
	Proposed plan change 1 – short term target	20	28	34	50
	Proposed plan change 1 – 80 year target	20	20	20	20
	NPS target attribute A	≤10	≤10	≤10	≤10
	NPS target attribute B	>10 and ≤ 20	>10 and ≤ 20	>10 and ≤ 20	>10 and ≤ 20
	NPS target attribute C	>20 and ≤ 50	>20 and ≤ 50	>20 and ≤ 50	>20 and ≤ 50
	NPS national bottom line	50	50	50	50
95%ile *E.coli* (n/100ml)	LAWA data (2017)	113.75	2020	2600	3180
	Proposed plan change 1 – short term target	60	340	774	1584
	Proposed plan change 1 – 80 year target	60	260	540	540
	NPS target attribute A	≤540	≤540	≤540	≤540
	NPS target attribute B	≤1000	≤1000	≤1000	≤1000
	NPS target attribute C	≤1200	≤1200	≤1200	≤1200
Clarity (m)	LAWA data (2017)	2.42	1.415	1.17	0.62
	Proposed plan change 1 – short term target	2	1.7	1.4	0.7
	Proposed plan change 1 – 80 year target	3	1.7	1.6	1

89 Sites selected at random to represent lower, central and upper Waikato River sites. Data and information sourced from WRC Water Quality Monitoring sites: Waikato River Water Quality Monitoring Programme (WARIMP), Plan Change 1, NPS 2017

Appendix H Waikato growth areas (10 years)



Water growth areas 10 year period



Legend

- Future Proof Partners Region
- NZ Territorial Authorities Boundaries (2012)
- Waikato River catchment
- Rivers
- NZ Lake Polygons (Topo, 1:500k)
- Tributaries and streams

Future Ability To Service

- Infrastructure Planned To Service
- Moderate Infrastructure Provisioning Required
- Difficult To Service

Data sourced from Waikato District Council, Waipa District Council and Hamilton City Council Long Term Plans 2018-2028.

Wastewater growth areas 10 year period

Appendix I Economic costs of water service delivery

Waikato sub-region water supply cost of delivery economic data 2017-18[90]

Parameter	Hamilton	Waipā	Waikato	NZ average
Average annual residential charges for water ($/year – based on 200m3 per year)	$217	$308	$578	-
Total revenue per property	$607	$850	$670	$553
Actual capital expenditure per property	$316	$574	$228	$263
Operating cost per property	$213	$212	$388	$295
Operational cost coverage[91]	1.289	1.507	0.874	-

Waikato sub-region wastewater cost of delivery economic data 2017-18[92]

Parameter	Hamilton	Waipā	Waikato	National average
Average annual residential charges for wastewater ($/year – based on 200m3 per year)	$202	$489	$897	
Total revenue per property	$748	$704	$1,276	$673
Actual capital expenditure per property	$316	$824	$487	$342
Operating cost per property	$266	$161	$613	$286
Operational cost coverage	1.2355	1.4475	1.0311	-

Waikato sub-region stormwater cost of delivery economic data 2017-18[93]

Parameter	Hamilton	Waipā	Waikato	National Average
Average annual residential charges for stormwater ($/year – based on 200m3 per year)	$192	$189.38	-	-
Total revenue per property	$116	$358	$245	$170
Actual capital expenditure per property	$52	$228	$108	$96
Operating cost per property	$59	$103	$75	$79
Operational cost coverage	0.390	-	1.210	-

90 Source: Water New Zealand National Performance Review (2017-2018)

91 Operational cost coverage note: Where a value is less than 1.0, revenue is insufficient to meet costs and/ or maintain the asset to current levels.

92 Source: Water New Zealand National Performance Review (2017-2018)

93 Source: Water New Zealand National Performance Review (2017-2018)

Appendix J Case study opportunities

CAMBRIDGE WASTEWATER TREATMENT PLANT CASE STUDY

The Cambridge wastewater treatment plant is currently owned and operated by Waipā District Council and services the Cambridge catchment area with a population of 20,800. It was first repurposed in 1997 from a meatworks water treatment facility, and since 1997 the plant has been unable to meet its consenting conditions particularly in relation to its discharge of nitrogen into the adjacent rapid infiltration beds (RIBs). It was generally understood that the plant was never built for this purpose and the design of the plant could never fully achieve its consent conditions in the first instance.

In 2011, Waipā District Council went through a process to reapply for new consents. At this stage options were drawn up to upgrade the plant. However, all options considered were unable to deliver noticeable river quality benefits without considerable, potentially unaffordable, investment. Trials including with government agency NIWA were then undertaken to test new innovative processes and their effect on discharge quality. Unfortunately, after considerable time and review, the new trialled processes were unable to deliver benefits for high capacity flows. Furthermore, the population growth rates and projections for Cambridge were significantly underestimated when compared to actual.

Waipā District Council is now at a crossroads where there is significant pressure to upgrade its wastewater treatment plant to firstly meet its consenting conditions and new national targets, and secondly to respond to substantial growth in the area. Waipā District Council is still faced with the same issues around delivering significant water quality benefits with the available long term plan budget, and providing a futureproofed solution which does not restrict or limit growth opportunities over the life of any new discharge consent.

Sub-regional opportunity

Currently Waipā District Council is in the process of preparing an indicative business case (IBC) to assess potential options for stand-a-lone localised delivery. As well as local options, one of these options is to invest in a sub-regional wastewater treatment plant. This would involve the construction of a new plant (potentially located near Mystery Creek) which could deliver a 70%+ reduction to nitrogen and phosphorous levels at the point of discharge. The plant could also be designed to cater for growth within the Cambridge catchment area, the southern Hamilton area, Hamilton Airport commercial and industrial property park, and unlock greater residential development within the Peacocke's area.

Key benefits of a sub-regional option compared to a decentralised option

- The potential to unlock both residential and industrial growth in the south of Hamilton, identified as Peacocke- Airport Precinct- Hautapu- Cambridge West in H2A.
- Removes capacity pressures at Pukete WWTP (currently at capacity).
- New build can be tailored and designed to allow for easy capacity upgrades and provide high quality discharge.
- Allows for some operational efficiencies through economies of scale.
- Greater consistency across consenting requirements and ability to provide an integrated approach to delivering best for river outcomes.
- Greater number of potential funding mechanisms to grow communities.

Further considerations

Timing is a very real constraint for Waipā District Council which is under considerable pressure to improve the operations at the plant. A short term consent is currently being negotiated which will provide a temporary consent for the next six years. After this point there is an expectation that significant, long term improvements will be implemented. A sub-regional option is likely to take longer than this timeframe to be fully operational and therefore an interim/medium term solution will need to be considered.

HAMILTON MORATORIUM ON WET INDUSTRY SUPPLY CASE STUDY[94]

In 2009, Hamilton City Council obtained a 35-year consent (from WRC) to extract water from the Waikato River based on forecasted growth (non-high water use activities). This consent expires in 2044 and is based on stepped increases in maximum daily take volumes. The growth forecasts used at the time of consenting did not include provision for servicing new high-water use or wet industry activities (defined as high water users) who also produce significant trade waste discharge either in terms of contaminant load or volume.

Following granting of this consent, the council accepted some wet industry water takes based on working with them to obtain a resource consent to add to the existing allocation. The river is now regarded to be over allocated in Hamilton city during low flow summer river conditions and the current prospects of securing new allocations for non-domestic and municipal purposes are extremely low. The council is occasionally approached by developers seeking to expand or establish new high water use and wet industry activities in the city. Up until June 2019, these approaches were assessed on an ad-hoc basis as there was no policy guidance in relation to servicing high water use and wet industries.

High water use and wet industry activities have the potential to consume a large portion of water take and wastewater discharge allocations which can lead to demand interventions and general water shortages. To protect and manage these finite water resources and meet the needs of the city, in June 2019 Hamilton City Council approved a moratorium on further wet industry supply (high water use) requests while policy guidance is developed to deal with new high water use requests. This moratorium will remain in place until policy to assess high water use and wet industry activities is approved by the council.

Sub-regional opportunity

There is a sub-regional opportunity to increase collaboration between the three councils in the Waikato catchment and potentially share allocations of consented capacity takes from the Waikato River, particularly in relation to wet industry. There is also an opportunity to collectively plan locations of wet industry land uses on a sub-regional basis and jointly develop policy guidance for wet industry supply in the sub-region.

Key benefits of a sub-regional option compared to a decentralised option:

- The potential to unlock commercial and industrial growth in the wet industry in the sub-regional catchment area where water supply is most appropriate.
- The creation of sub-regional employment in wet industry activities.
- Improving network resilience with treatment plants servicing joint zones within two council boundaries.
- Added flexibility when managing consented water allocations from the Waikato River.
- Managing consents at a *whole of catchment* level to manage delivery of sustainable water supply and best for river outcomes.
- Utilising offsets at a sub-regional level.

Further considerations

Hamilton City Council has been approached by several developers in the last 24 months seeking to expand or establish new high water use and wet industry activities in the city. There is a short term risk the temporary moratorium on wet industry supply will constrain new commercial and industrial growth in Hamilton and the Waikato sub-region.

94 Source: https://www.hamilton.govt.nz/AgendasAndMinutes/Growth%20and%20Infrastructure%20Open%20Agenda%20-%2018%20June%202019.pdf

SLEEPYHEAD CASE STUDY[95]

The North Waikato town of Ohinewai, located on State Highway 1, identifies as a key part of the Hamilton to Auckland (H2A) Corridor. Earlier in 2019, The Comfort Group (the company which owns the Sleepyhead brand) proposed the purchase of 176 hectares of rural land in this North Waikato area. On this land, the company plans to develop a master plan for a 100,000m2 manufacturing site (to relocate their existing operations from South Auckland), and a mixed-use community with 1100 new homes over the next 10 years. The community would be named Sleepyhead Estate.

In total, Sleepyhead Estate is expected to consist of a 66ha industrial hub, 33ha of new housing (primarily built for Comfort Group employees) and 60ha of public open space. The estate will cost $1 billion to develop over 10 years. The company's exit from their current Auckland industrial location will be staged. During this period the company will subsidise the travel costs of Auckland resident staff who will work in the North Waikato.

The major drivers for the development are:

- a lack of available land for Comfort Group to expand their existing manufacturing operations within Auckland
- the immediate availability of road and rail access
- the provision of affordable housing for Comfort Group employees
- some staff were already driving from Hamilton and Huntly and many lived south of the company's current sites and were spending up to 40 minutes driving to work each day.

The expansion of the company's manufacturing capability (associated with the move) means staff numbers at Comfort Group are expected to increase from 500 to 1500 within six to eight years.

Sub-regional opportunity

Proposed Sleepyhead sites are located centrally within the high growth Hamilton to Auckland (H2A) Corridor. This significant area is set aside for large scale residential development in the next 30 years under the H2A Corridor Plan. The council is currently planning a $38 million new wastewater plant for Te Kauwhata. It was hoped this could also cater for the proposed Sleepyhead development. There is an opportunity to plan the land use of H2A around an efficient three waters network and provide new infrastructure (where required) to unlock this development as well as future residential and mixed use developments proposed in the H2A Corridor Plan.

Key benefits of a sub-regional option compared to a decentralised option

- Economic growth and increased employment opportunities in the North Waikato.
- Affordable and healthy housing constructed and communities enhanced in the North Waikato.
- Infrastructure-led land use planning and town planned residential and community development.
- The potential to unlock substantial further residential and industrial growth as outlined in the Hamilton to Auckland Corridor Plan.
- Any new build infrastructure can be designed to cater to forecast future demand, or can be easily upgraded and provide high quality discharge.
- Greater community and cultural connections with the Waikato River with consenting consistency and improved water quality and best for river outcomes.

Further considerations

According to regional economic agency Te Waka, Comfort Group would be the second major business to relocate from Auckland to the Waikato after Visy built a $100 million factory at Hamilton Airport in 2018. If the Comfort Group move proves successful in the coming years, other companies may be prompted to look at similar relocation ventures in North Waikato, to growth areas that would be potentially serviced by assets delivered under the proposed sub-regional approach.

95 Main data source: NZ Herald, 24 Jul 2019. Sleepyhead's $1 billion dream venture: Ohinewai site to include staff affordable home options, Retrieved 31/07/2019, from https://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=12252196

Appendix K Draft initial long list of options

Integrated management	Water	Wastewater	Stormwater
• District plans • Common practices and alignment of DPs • All policies consistent across the region • Opportunity to use national planning standards • Regional consents • Educational initiatives • Integrate processes, ideas • Use rules across the region • Everybody in the catchment • Regional zoning • Baseline population projections and consistent assumptions • Integrated rating system • Development contribution rationalisation • Consistent decision making framework (water & energy) • Umbrella body over all participating regions (steering group) • Find an owner for the river that has an integrated view • GIS layer • Industrial park concept and dedicated areas with appropriate infrastructure • Beneficial reuse • Use of residential area run off for industrial use (diversion) • Technical specs and district plan consistent • 4 wellbeings incorporated into district plan and RITS • Water meters (demand intervention and understanding) • Regional water allocation	• Allocation – regional based allocation consents, how estimated, Net takes vs "O" sum takes, WW reuse, quality of discharge impacting water take • Decision making framework – who makes decisions, should playgrounds compete with public health? • Consistent policy around high-water users • Education • Carrot (incentives) • Water and WW consents need to be linked • National discussion about energy industry vs local govt • Universal metering • Reuse tanks to help offset peak demand • Demand management alignment • Efficiency targets • Connecting networks • Partnerships and collaboration to best use • Plants servicing multiple areas • Diversifying H20 source • Alternate funding mechanisms (public private partners) • Storm water reuse • Decentralisation • Education of the limited resource • Water is a valuable resource (precious/treasure) • Recognition that councils aren't the "bad guy" • Central govt leadership • Make a plan and stick to it	• Cambridge as a key growth area could service Tamahere, Matangi, Tauwhare, airport, second large plant at Hamilton North • South Hamilton sub regional – similar to above but opportunity to divert subcatchments from Pukete and provide for other Hamilton development plus Horotiu plus Ngāruawāhia etc. • Reduce discharge volumes • Potential for recycling via membranes • Small land application schemes • I&I reduction programmes • Shared definition of what is our best practice/what is our target • Sewer mining (small MBR, effluent to golf course irrigation, reject/WAS back to sewer • Recycle Dairy condensate from Fonterra Te Rapa to a wet industry zone at Horotiu • Irrigation of mountainbike park and key irrigated area within HCC • Integration of private plants (e.g. AFFCO and Mercer) • River communities • Global consents (load based not concentration) • Change funding mechanisms • Practical conditions that do something for the river • Hydraulic balancing of the river • WWTP as an opportunity to improve river water quality	• Change rural drainage management responsibility • Integrated management of all drainage/networks • Starts with clearly understanding existing condition and enhancement of water courses • Cross boundary collaboration and co-funding • Centralised funding mechanisms • Planting and riparian improvement • Cross boundary consistency in standards, conditions, planning • Catchment wide programme of works (prioritised) • Owner of baseline data (custodian of data/ information) • Mandatory on lot treatment (needs audit process and data capture) • Mandatory soakage to maintain natural hydrology • Controls of roofing materials (zinc) • Supply chain controls • Provide access to waterways • Wide riparian areas/ greenspace/blue-green corridors • Urban form (up vs out) • Reduce vehicle use, alternative modes of transport • Regional drivers for wetland restoration • Multi benefit restoration • Offset mitigation (large scale)

- Aligned water management targets (water loss & I/I)
- Best practice – lead by example
- Consolidation of networks and treatment (cross boundary)
- One set of management principles
- Balanced level of service
- Bylaws aligned
- Data pool information
- Where are the best places to extract/discharge/develop/ locate industry?
- Regional offsetting
- River model (contaminant, sensitivity, cultural sites)
- Where is the best provision for water, transport and energy?
- Understand barriers to grey water reuse
- Value water resource
- Integrated watershed management
- Bores
- Cradle to grave
- Central government leadership
- Education to change long term thinking
- Every drop matters
- Improve the interface of people with water
- Green roofs
- Waipā River not well considered from integrated management perspective
- Community focused management
- Subsidisation of upgrades
- Affordability based infrastructure
- Socialist model funding
- Central government funding
- Funding models
- Shared data capture/ collection
- Consolidating water takes and infrastructure (environmental impact of many vs few)
- Overarching framework
- Shared expertise
- Determining growth boundaries
- Economies of scale
- Privatisation
- Iwi allocation of water
- Water ownership
- Aligned metadata
- Look outside our industry for solutions for expertise
- Best network investment practice
- Groundwater takes for industrial/non-potable
- 3 pipe system to reduce demand on river takes
- Strengthening water policy (true integrated planning)
- Demand based water pricing (water rationing)
- Waiora WTP to service airport (Waipā)
- Do the servicing areas make sense?
- Cross boundary equity issues
- What are the physical constraints to servicing (strategic land purchases)
- Where is best bang for buck ($100s millions addressing 3% of nutrient load)
- Offsetting
- Amended funding models
- Energy and resource recovery
- Biosolids sub-regional facility
- Assign industry experts to make key decisions
- Changes to provide leadership from central govt
- Targeted educational programmes
- Banning of inappropriate substances (wipes, phosphorous, micro beads)
- Prepare for long term attitude change
- Trade waste contracts incentivising beneficial components
- Strategically (nondeveloper) located wet industry hub/s
- Learn to take an intergenerational view on scheme development
- Education of the public
- Change of mindset
- Work with industry rather than just dictating to them
- Programme to minimise pump station overflows (strategic overflow locations, key storage nodes, best practice definition)
- Storm water treatment in wastewater terms (E. coli reduction)
- Development of a biokinetic model of the river that provides for management of assimilative capacity and water quality initiatives
- Enhancement in restoration needs maintenance and budget
- Large scale rainwater harvest (including on lot)
- Wetland restoration opportunities (buying farmland, retiring land)
- Reuse opportunities
- Education (green infrastructure, bio diversity)
- Restoring species, food sources, cultural access
- Step 1 consistency (operational and enforcement)
- Need capability in all parts of sector
- Regional understanding of flood risks and hazards
- Regional spatial planning (make best use of land)
- Understanding and communicating benefits across the sub-region (storytelling)
- Don't build in flood hazard areas
- Accept climate change is happening
- Understand current effects, networks and how they work
- Integrate SW, WW, water treatment and reuse
- Global consenting
- SW as a resource
- Strategy/NES for materials and chemical use
- Strategy for @ source reduction
- Requiring max impermeable surface based on achieving Vision and Strategy
- Erosion – starvation of bedload

• Change to 3 Waters governance model • Better integrated decision making from regional council • Global consents (across region and activities) • Work with other dischargers (e.g. farmers) • Public private partnerships to help minimise discharges • Nothing is considered and decided on in isolation (rules to support this) • Council step up with grey water reuse			• Street cleaning to reduce organic loads and contaminants • • Litter traps and education • Micro hydro from outfalls (energy recovery) • Need to recognise dependencies/ interdependencies • Permeable solutions (filters and storage) • Naturalised solutions that provide amenity • Holistic solutions through constructed systems (flourishing eco systems) • Maori restoration built into our planning processes and integrated into design • Regional SW squad • Acknowledge that some areas should not be developed (no go areas just as important as ideal growth areas) • @ source reduction and treatment • Urban design that considers/ avoids overflow to SW network (e.g. driveways) • I&I reduction (reduce wet weather overflows to SW) • Incentivise reduction of contaminants @ source • Development known solutions that achieve zero impact and enhance ongoing maintenance and supply • SW service charges (polluter pays) • Spatial and land use planning must consider how to give effect to the V&S