

A photograph of a child playing in a water fountain. The child is in the foreground, jumping and splashing water. Other people are visible in the background, also playing in the fountain. The scene is outdoors with trees and a clear sky in the background.

Tāmaki Makaurau Auckland's future water sources

Citizens' Assembly Information Booklet



THE UNIVERSITY OF
AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

KOI TŪ:
THE CENTRE FOR
INFORMED FUTURES

Watercare



Thank you

Tēnā koe mōu i whai wāhanga ai ki te wānanga i ētahi taunakitanga uaua, nui hoki mō tō hapori te take. Mā tō noho mai ki ēnei kōrero e pā ana ki ngā tikanga tiaki wai i Tāmaki Makaurau, kua takoha mai koe i ō tāpaetanga nui ki te oranga o ō tātou iwi me tō tātou taiao.

Thank you for participating in making important recommendations on behalf of your community. By being a part of this discussion about water management in Auckland, you are making a meaningful contribution to the health of Aucklanders and our environment.

Why are we here?

Tāmaki Makaurau Auckland is growing and our climate is changing. Our growth will result in higher volumes of wastewater and flooding from stormwater. We need to explore options for a comprehensive water system that will provide additional protection to our environment and waterways. How can we utilise our water resources in a way that works for our city?

Knowing this....

what should be the next
source (or sources) of water
for Auckland?

This booklet is for participants in our citizens' assembly. It will help you understand the water system in Auckland and what our next sources of water might be as we look ahead. There are spaces for you to take notes throughout the booklet. We encourage you to question the information you find in here and ask for help and further clarification when you need it.

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Water in Tāmaki Makaurau Auckland: an introduction

Tāmaki Makaurau Auckland is a water city. Auckland's harbours and its nature – like beaches and bush – is what makes life special.

The ability of water (or its mauri) to support life helped Tāmaki Makaurau Auckland and its people live well for a long time. Water bodies are important to the traditions in Tāmaki. They are also important to the lives of iwi and hapū who whakapapa here. Māori like water bodies because they have life-sustaining forces (or mauri).

Colonial settlers changed many traditional ideas about water. Water is now more and more understood as a resource. At the end of the 20th century, people began to better understand the negative impacts of water management. Concerns about Auckland's waterways and harbours and our drinking water grew. Water management began to change. With only few limits in place, most Aucklanders often experienced lack of water in their lives.





As Auckland sits on a small piece of land between two oceans, it has traditionally received most of its water from catchments. These catchments are in the hills to the south and west. Dams provide water that needs little treatment and energy. Gravity is then used to transport the water into the city. Local aquifers and rivers are now also used to increase water availability.

At the beginning of the European settlement, local surface and groundwater (Auckland Domain duck pond, Western Springs etc.) were enough to supply the region. Later, in the 1800s, people learned that the water supply was no longer enough to support the growing population. A few dams were built to increase supply and meet population growth. This took 70 years. Water restrictions were common for many people in this time. Our biggest, dam, Mangatangi in the Hunua Ranges, was finished in the 1970s. It was able to supply one third of all water. This helped with the 1982-83 drought. However, limits had to remain because the pipes and the water network needed improvements before bringing this new water into the city.

As you can see, Auckland's water story is one of geography and population growth. Catchment areas above the city are almost our only source of water from our own region. Even our two largest dams, Mangatangi and Upper Mangatawhiri, are in these areas. Their water used to flow into the Waikato river until dams were built.

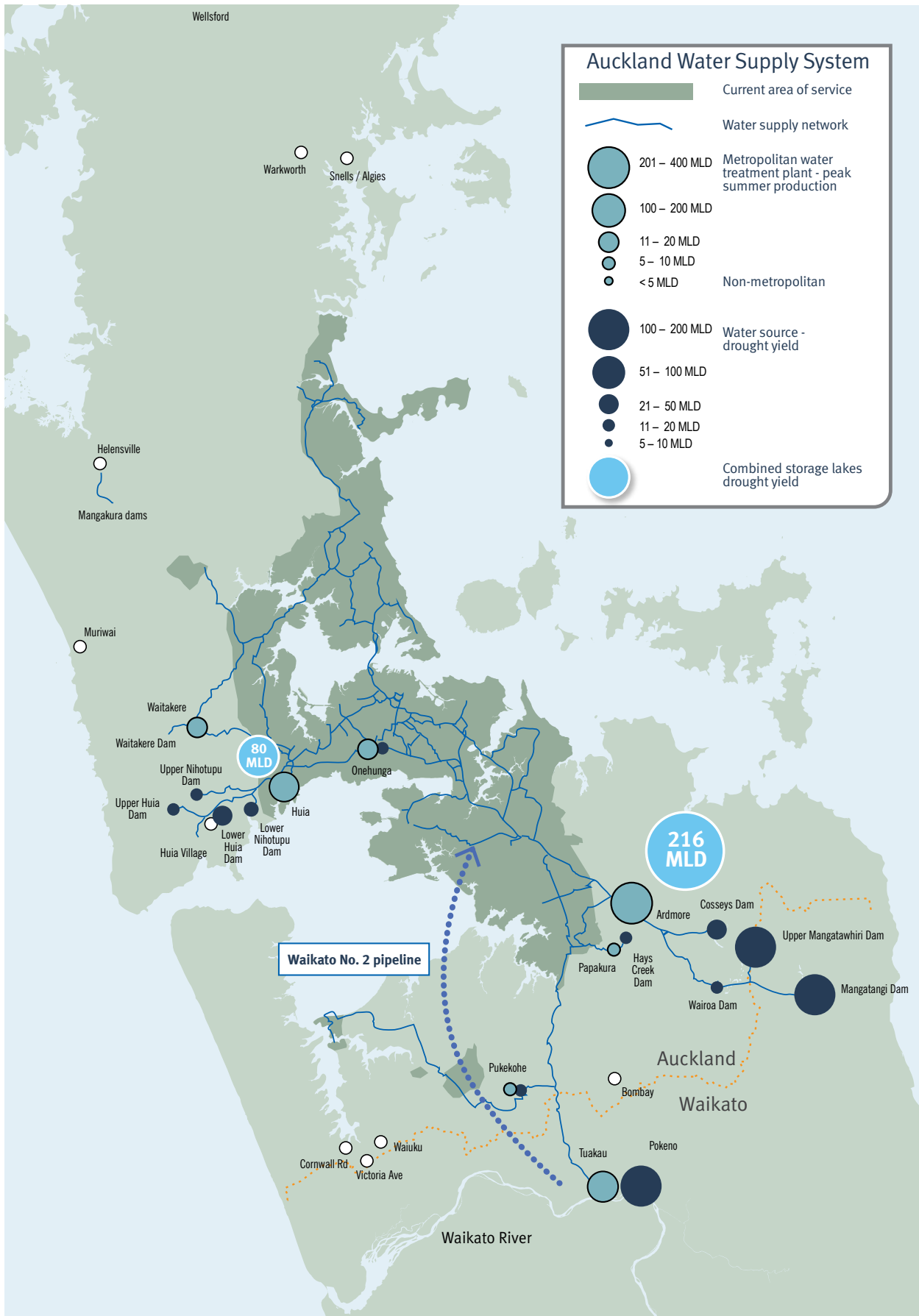
It was in the late 1980s when people wanted to ask for consent to draw water from the Waikato River. These ideas were first introduced in the 1800s. The Waikato is New Zealand's longest river and catches far more water than Auckland. Following another drought in 1993-94, Watercare started its first application to draw water from the Waikato. After the 2020 drought, another application for water was given.

Increasing the water supply has better prepared Auckland for droughts and other extreme events. But we also need to understand how population growth means we need more water. We are already seeing some of the harmful effects of population growth on our environment. In 1970, Auckland's population was only 635,000 people. Today, we are at almost three times that! It is clear that getting water from outside our region is complicated.

Our future water security depends on us increasing our water sources and sustaining people's lives. But we also need to protect our environment. Auckland Council's 2022-2050 Water Strategy has named respect for the mauri, or life-sustaining capacity, of Auckland's water to be the most important aspect of decision-making about water. This assembly is about the people from Tāmaki Makaurau Auckland owning the life-sustaining ability of Auckland's water and the need to protect our city.



Where Auckland's water comes from - 2022





Why are you here?

The current and future citizens of Tāmaki Makaurau need to have access to safe and abundant water.

You are one of 40 Assembly members. Each Assembly member has been selected to represent the diverse people of our city. We have tried our best to make sure that every person over 18 has an equal chance of being chosen. The makeup of the Assembly reflects the population of our city as closely as possible. This includes things like ethnicity, age, gender and education. This means the different views and values of the community are included in the development of a future of water.



What is the aim?

The aim is to provide advice to Watercare to guide decision making on future sources of water. The recommendations should be specific, measurable and realistic.

Your role

You have agreed to meet four days in person in August and September and for two evenings online. This is essential for the process to be successful.



This information booklet provides useful information before the first Assembly. Please read it.

You will have a chance to ask questions from a range of experts. The organisers will select some experts. The members of the Assembly can also select experts they want to provide information. During the four days you will:

- Discuss and compare the possible outcomes and implications of each option you identify
- Make decisions, informed by information on the different options and expert advice
- Find shared ground. Find solutions that you can all live with.
- Make recommendations as a whole group to Watercare at the end of this process

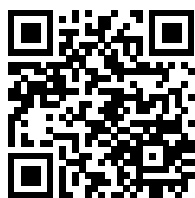
Watercare have committed to responding with what they will do with each recommendation.

If you want to read more:

☐ [newDemocracy Foundation. What is a Citizen's Jury? - YouTube](#)

☐ [WHY ELECTIONS ARE BAD FOR DEMOCRACY - YouTube](#)

☐ [What if we replaced politicians with randomly selected people? | Brett Hennig - YouTube](#)



If you want to know more,
please visit the project website
<http://complexconversations.nz/>
or scan the QR code where you will
find links to useful resources.

Watch on YouTube



newDemocracy Foundation.
What is a Citizen's Jury?

The Assembly Timeframe

Assembly session 1 - Saturday, 6 August 2022 | 9:30 am - 5:00pm

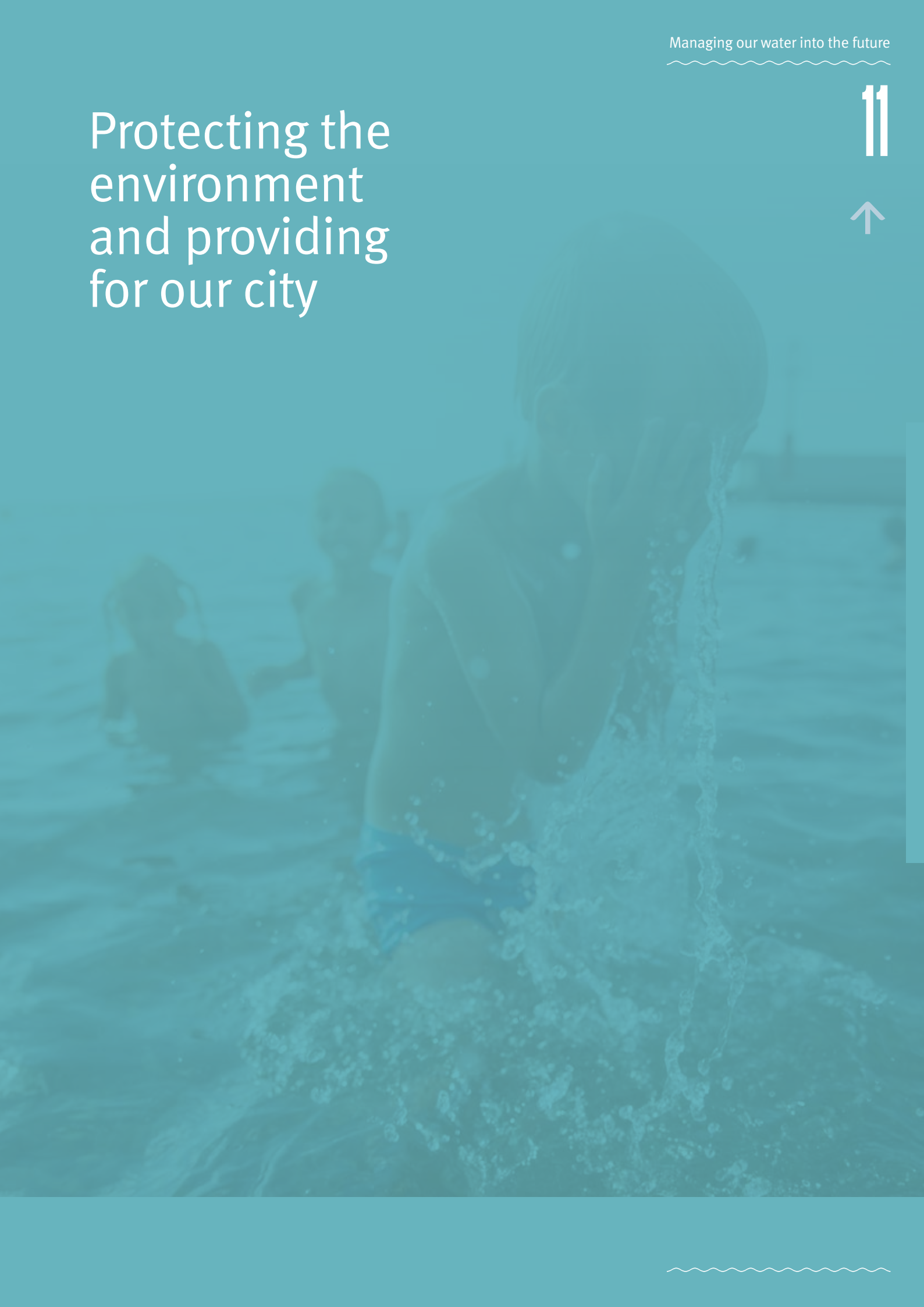
Assembly session 2 - Saturday, 20 August 2022 | 9:30 am - 5:00pm

Assembly session 3 - Saturday, 10 September 2022 | 9:30 am - 5:00pm

Assembly session 4 - Saturday, 24 September 2022 | 9:30 am - 5:00pm

Protecting the environment and providing for our city

11





Why now?

- The next source may not be needed for decades, but we need lead in time to plan, design, engineer and ensure that feedback is incorporated into design.
- We know that there are numerous hurdles for public acceptance of all the options on the table: cultural, social, economic, regulatory and engineering.
- Overseas experience shows that years of public communication may be needed before people understand and accept some options and any legal and technical barriers are overcome.
- We need to be proactive and ensure supply is available ahead of demand, so we don't risk running short.
- Auckland would be the first movers in New Zealand for most options presented so there may be regulatory hurdles to overcome before we can build.

Background on the Waikato

Watercare has committed to finding alternative sources of water for Auckland, and will not apply for additional water from the Waikato, although existing consents to take water from the river will be renewed.

The 'next source of water' is to cater for population and economic growth in Auckland past 2040, and will not come from the Waikato river.



The Watercare position is that the Waikato River will continue to play a vital role in Auckland's water supply now and in the future. Waikato iwi and the Hamilton City Council are supportive of Auckland finding an alternative source from beyond the Waikato region.

In 2022 a 20-year consent was granted allowing us to take up to 150 million litres a day from the river. This built on an existing consent for 150 million litres that is still active (meaning we have a total of 300 million litres available a day once additional treatment capacity is built to cater to population growth). Feedback from the river authority and iwi was that the Waikato River shouldn't be seen as an ongoing supplier for Auckland's water.

Over the life of the Auckland Water Strategy, demand reduction measures and alternative sources are essential parts of Auckland's water supply solutions. Through these, Auckland will increase its water security to balance its reliance on the river and how to enhance it with Auckland's growth over time. Additional water source investigations are underway, including pilot projects for wastewater recycling for non-drinking uses.



We need to start planning now for how we will manage our drinking water in the decades to come



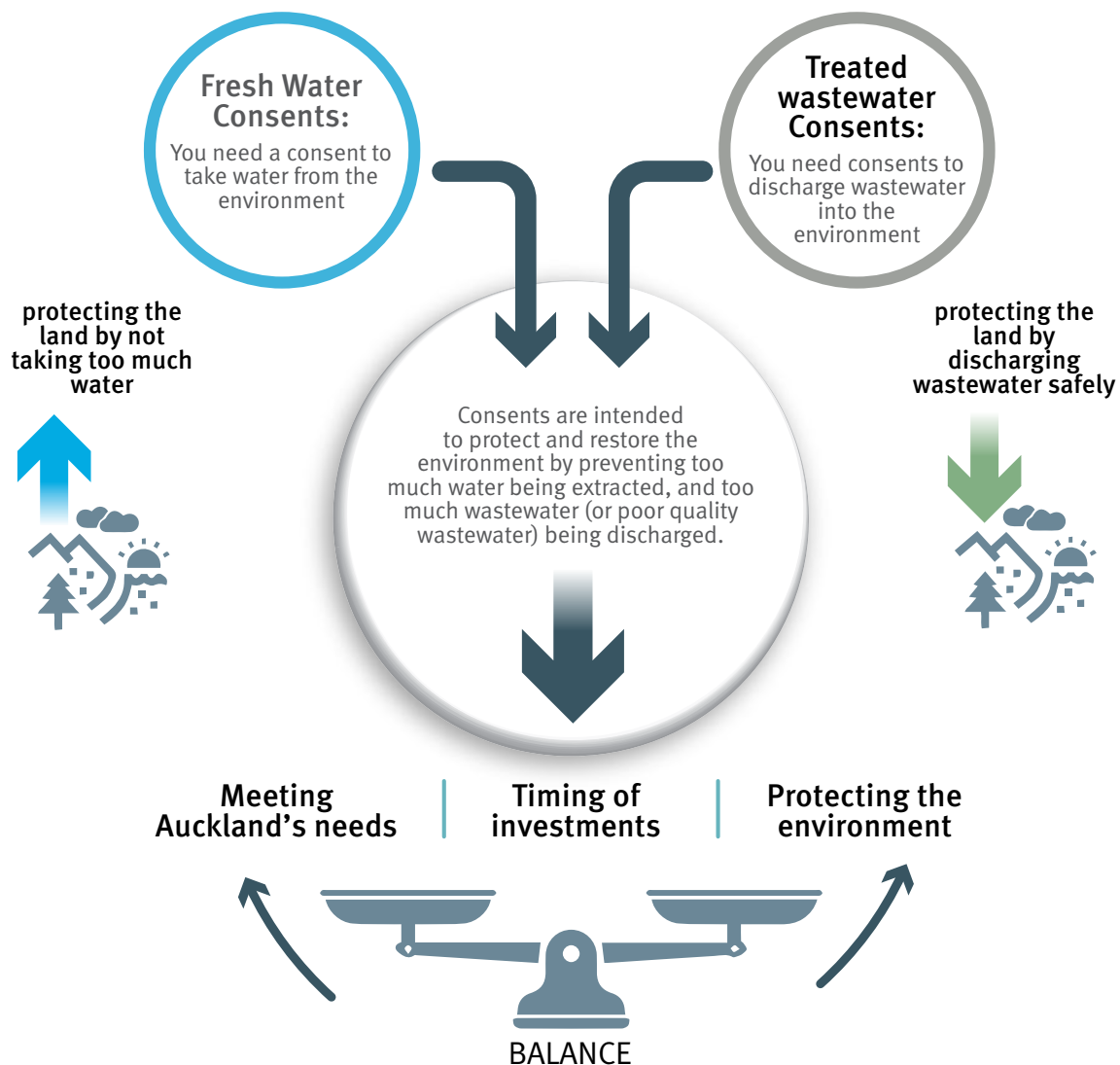
Resources consents help us to protect the environment

A resource consent provides permission to carry out an activity that affects the environment. There are two main consents that check Watercare's ability to expand our operations.

1. Freshwater resource consents and
2. wastewater resource consents.

We have started to think about water and wastewater together because re-using water emerges as a topic when we apply for and/or are granted consents.

Consents have limits and they have timeframes, so they need to be renewed. As our consents reach maximum limits, or approach expiry dates, we need to work out how we can ensure that we can balance meeting Auckland's needs in a way that is timed to ensure that consents are not breached and we are meeting our obligations to the environment. On renewal, a significant number of consent end up with tighter/harder limits which further erode the water available.



The real puzzle is how we think holistically about protecting the environment and providing for our city

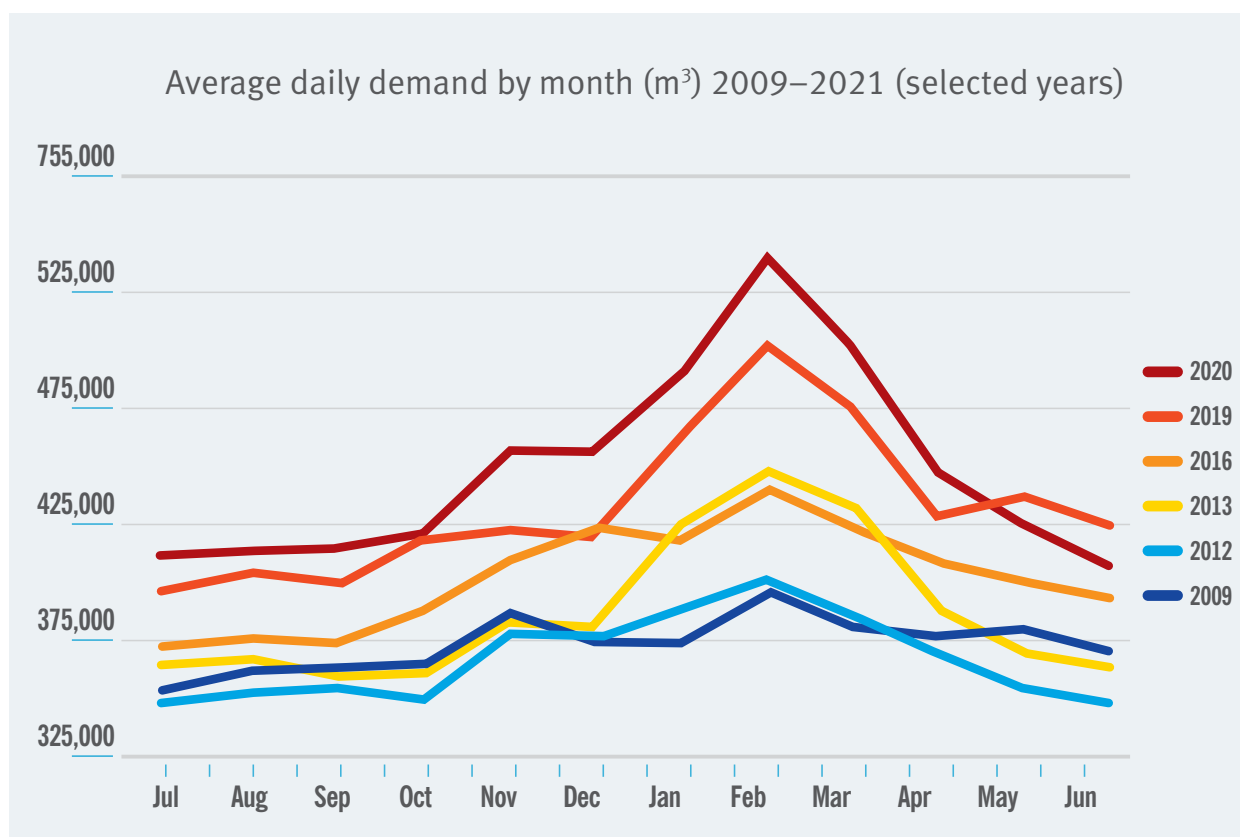


Climate change: how changing rainfall and hotter summers affect demand for water

Rainfall: the more summer rainfall we get, the less water the average person uses. People don't need to water their gardens, and they tend to stay inside more, meaning fewer water using activities.

Heat: as it gets hotter, people use more water. People often have a second shower in a day as the temperature gets above 25 degrees.

Dry weather: long spells of dry weather also mean that Aucklanders reliant on tank water may need to access the water supply network.



Our peak summer demand reached a record high of 560 million litres per day over several days in February 2020

The Auckland Water Strategy has a demand pathway to support raintanks use for non-drinking purposes, as well as smart meters, reuse of water and other water efficiency initiatives.

In the chart below, you can see that people used a lot less water during the colder and wetter summers of 2009 and 2012 than in the hotter summers of 2016, 2019 and 2020.

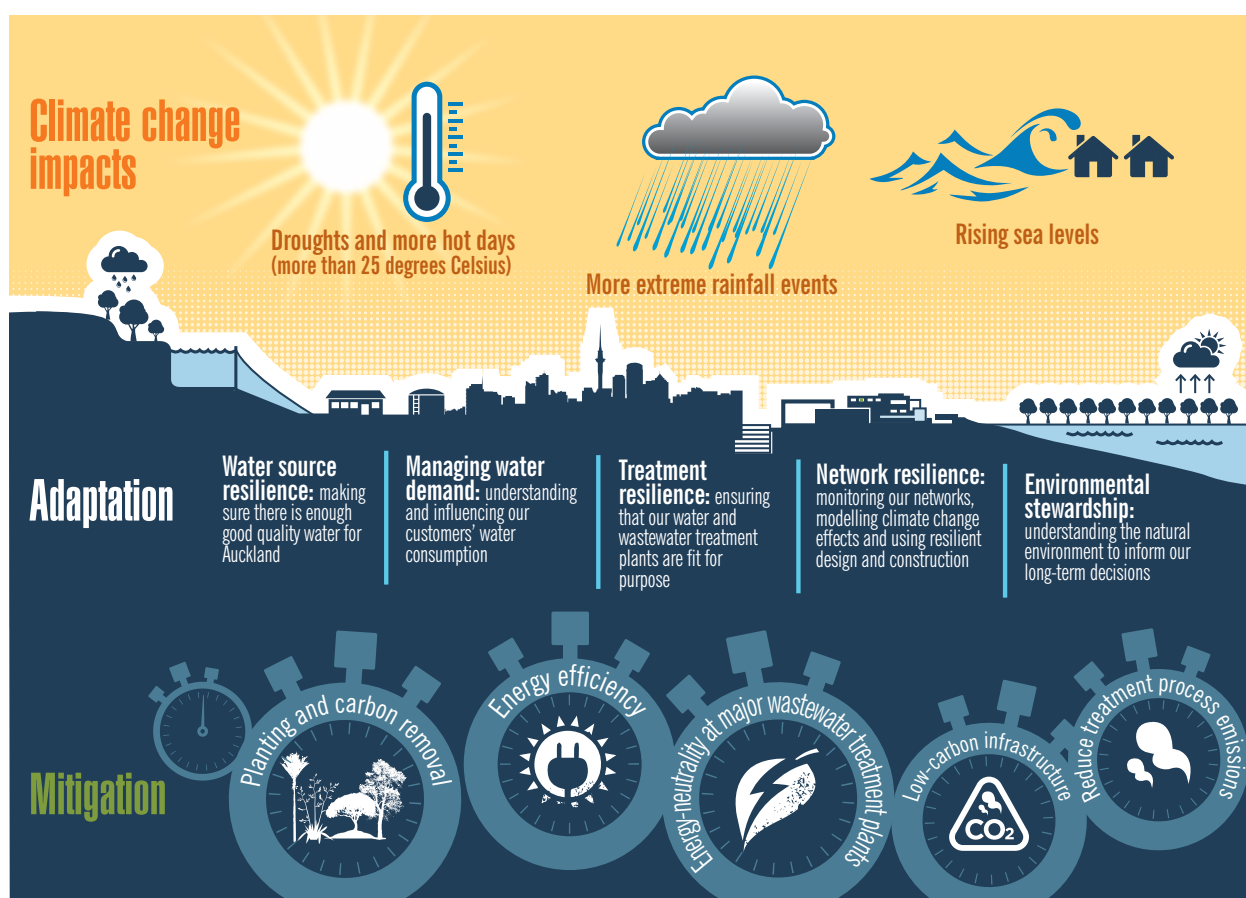


Our water supply network must be capable of meeting peak demand for water over the hottest days of summer



Climate change: Changing weather patterns also impacts our supply of water

- **Rainfall:** as rain fall becomes more unpredictable, due to changing seasonal patterns and levels of intensity and supply during extended droughts, this may impact the volume of water supply available throughout the year.
- **Floods:** with lots of intense rain after periods of drought, there will be increased risks of landslips in our catchments, which will result in more sediments in the water and treatment costs become higher.



Due to these climate pressures, existing sources will become less reliable for Auckland in the future. We have to find other ways to meet our needs for water

Beyond 2040 we will continue to ensure that our water supply system is resilient and adapts to climate change



Our population is increasing

Auckland is growing. From 2013 to 2019, our city grew by 187,000 people, and our economy (as measured by GDP) by nearly 40 per cent. Auckland's growth typically outstrips predictions. It remains New Zealand's largest manufacturing base and construction continues to be a key driver of the local economy. Every year, developers apply for new residential water network connections. These connections support a growing city that is likely to remain a key destination for many.

Even though we are far more water efficient,
we still use more water in total than ever before.



While Auckland is growing so are the surrounding regions. New Zealand's four northernmost regions, Northland, Auckland, Waikato and the Bay of Plenty, accounted for almost 60 per cent of the country's population growth between 2013 and 2019. They are home to more than half of New Zealand's population and have the task of sustaining livelihoods with the same amount of water. A plan for water efficiency is crucial to Auckland's future, but we need to plan for another source as well.



We have significantly reduced our per person water consumption but population growth means that we will still need to find another source of water



Our economy is growing

Auckland is growing. Economic growth in Auckland averaged 3.2% per annum over the last 10 years compared with an average of 2.6% per annum in the national economy. Watercare works with our largest commercial water users to ensure that they have the best water efficiency advice, but as the economy grows, so does the demand from organisations (eg schools, hospitals etc) and commercial customers who also need more water as they grow.



Watercare has a responsibility to the Auckland economy as well as its population: Auckland is competing with businesses abroad (like Sydney and Brisbane), not just other parts of New Zealand. So our supply is critical to New Zealand attracting international business.



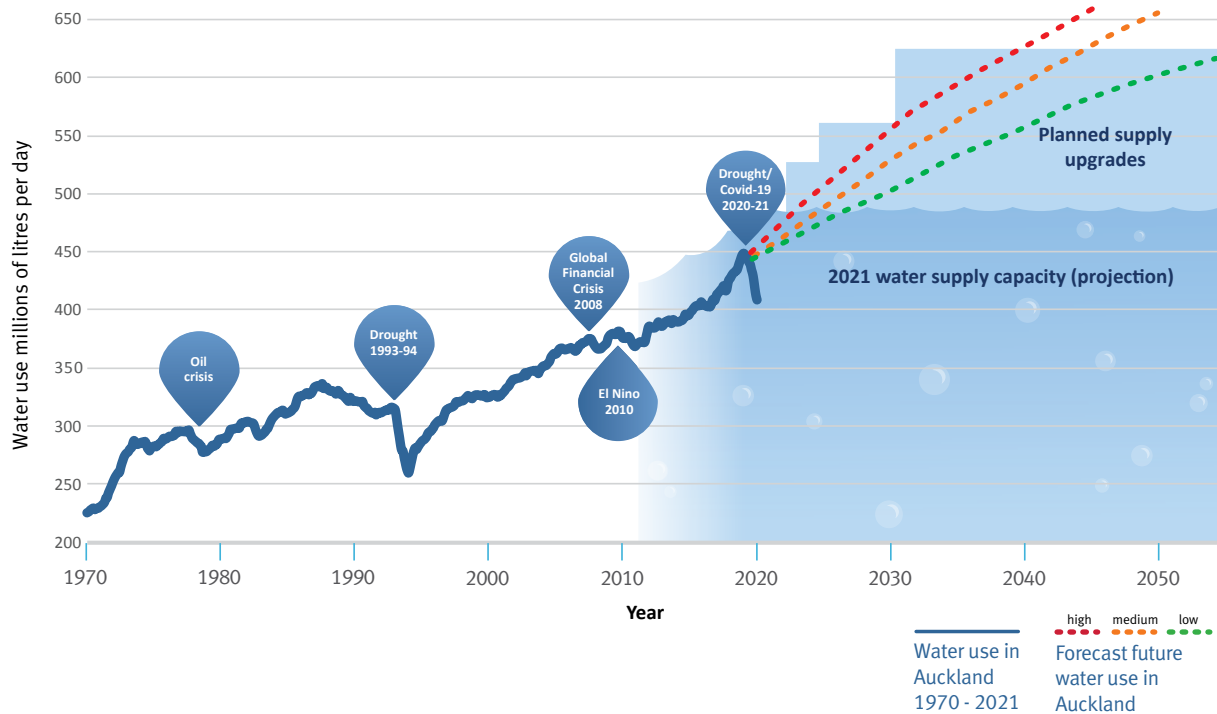
Watercare must plan for and respond to population and economic growth



Auckland's water supply and future demand

Watercare has planned supply upgrades until the mid-2040s to keep ahead of demand for water. However, our population and economy is projected to continue growing, so we need to start planning now for the next source of water for Auckland after 2040.

Auckland region annual supply and demand



This is why we are here: to work out what the next source of water for Auckland should be

Notes:

**NOW:**

What our current water system needs to manage

We benefit from rainfall in the Hunua and Waitākere Ranges as well as rainfall in the Waikato River's water catchment.

We plan for a growing population (growth rate of 1.8% per year).

Demand for water supply in Auckland is growing as the population and economic activity in Auckland increases. There are many initiatives already underway to reduce demand (ie. water efficiency).

Our capacity for discharging treated wastewater safely into the environment will approach limits in metropolitan Auckland in the next decade, due to population growth.

Our stormwater system is facing some negative effects: waterway health, flooding. The Central Interceptor is being built and will help reduce overflows during high rainfall events.

Rising temperatures may mean more demand in the height of summer. We are using the water from our dams faster in summer, allowing our dams to fill during winter. This means that we need to get enough rain in winter so that we can continue to use our water sources efficiently.

THE FUTURE:

What our future (mid-2040s) water system needs to manage

Less predictable rainfall patterns, with longer dry periods and shorter periods of heavy rain.

Water demand is predicted to exceed current and planned supply after 2040.

Auckland will be a hotter city, and water demand may rise in the future. While there will continue to be improvements in water efficiency, they will not be enough to address rising demand, and may even make managing demand harder to do (because people will already be using less).

Alternative and/or additional wastewater disposal options will be required as limits are approached, including options for all by-products: water, solids and any other residuals.

Denser houses may mean that the land becomes less permeable in the future, causing more stormwater runoff. In combination with climate change impacts, this may cause significant damage to stormwater ecology (unless stormwater friendly design is followed).

Rainfall is likely to be different with drier, longer periods in summer, interrupted by intense rain. There are other risks in our catchments: bushfires and drought when there is no rain, and when there is heavy rain after dry spells we may see more slips (making water more difficult to treat).



The problem at hand: a new, large source of water for Auckland

- We are looking for an additional 150 million litres a day from the mid-2040s to support population and economic growth and to be resilient in the face of a changing climate.
- We are aiming to identify the most socially, environmentally, and economically sustainable solution.
- We need to understand and balance the costs and benefits of different water sources.
- Not making a decision is also a decision that will have consequences.

How we meet our needs:



Able to meet peak demand:
Is operationally feasible during peak demand (the hottest days in summer)



Resilient:
Adapting for the predicted impacts of climate change (changing rainfall patterns)



Environmentally responsible:
An option that mitigates our impact on the environment and the climate



Socially acceptable:
Aucklanders understand and trust water produced by this option



Affordable:
Auckland bill-payers on the lowest incomes can afford this source of water.



How might we answer the question?

1

One big source:
150 million litres
per day, forever.
Why is this the option that
you can live with?

Notes:

2

A bundle
of options together.
Why have you decided
to go with this approach?

Notes:



What are some options?



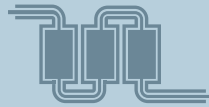
1

Reducing how much water we use



2

Rain tanks



3

Purified direct



4

Treated wastewater



5

Purified indirect



6

Desalination



Option 1: Reducing how much water we use

There are already a lot of initiatives underway to reduce the amount of water we use in Auckland, and the amount of water lost through leakage and other issues. Watercare is rolling out smart meters to commercial and residential customers and has invested heavily in fixing leaks and renewing water mains.



The Auckland water strategy also identifies demand reduction targets and approaches, among them:

- network leakage at 11% or less by 2030,
- reducing drinking water use to 247 litres per person per day by 2030, then 225 litres per person per day by 2050,
- careful management of peak demand across a diverse portfolio of water sources (to increase water security,
- increased orientation towards 'appropriate use' (ie. we don't need to use high-quality treated water to flush our toilets or water our gardens),
- and supporting central government to set targets for water efficient homes.



To reduce demand to the point where a new source is not required would involve significant additional investment:

The cost of these additional measures (which may be quite significant) might be borne by customers or businesses, addressed through pricing (ie. saving more through using less water) or through centralised government incentive schemes.

Notes:



Option 2: Rain tanks

Rain tanks are a good option to increase non-drinking supplies of water, which can be used for many household and commercial purposes. Watercare doesn't recommend using rainwater for drinking where the public network is available. Rain tanks are also useful for slowing the deluge of rainfall after severe weather which is good for our land and waterways.



In its water security actions, the Auckland Water Strategy notes the following:

- 30% of urban roof areas able to collect rain water for use by 2050,
- regulation and information to support water capture
- and a general commitment to 'regenerative infrastructure' (responding to, working with and enhancing natural systems).

Rain tank technology is improving, with space-saving storage options increasingly available.

As rainwater tanks generate most savings in times of frequent rain (as a substitute for water from the network) smaller rain tanks are generally not a solution to meeting peak summer demand. The smaller they are, the less benefit they tend to be in terms of savings to the overall region. In addition, during dry periods, customers who depend on rain tanks often need to purchase more water from tanker operators, as was the case during our 2019-2020 drought when many people with rain tanks ran out of water.



Notes:



What is recycled water?

Recycled water is wastewater that was treated. Treatment makes the water safe to use and can make it safe to drink if it's treated to a high standard.

We need to understand and accept a few things:

- Many of us drink recycled water all the time.
- A lot of people think recycled water is disgusting.

The Auckland Water Strategy has goals for recycled water. The goal is to produce 100 million litres every day by the year 2050. This will include rainwater and recycled water.

Recently, Auckland applied to take water from the Waikato. At this time, using recycled water was considered, and it was noted that there is a cultural need to pass wastewater through whenua (land) to make it safer. But this needs balancing with other environmental consequences.

For all kinds of wastewater recycling

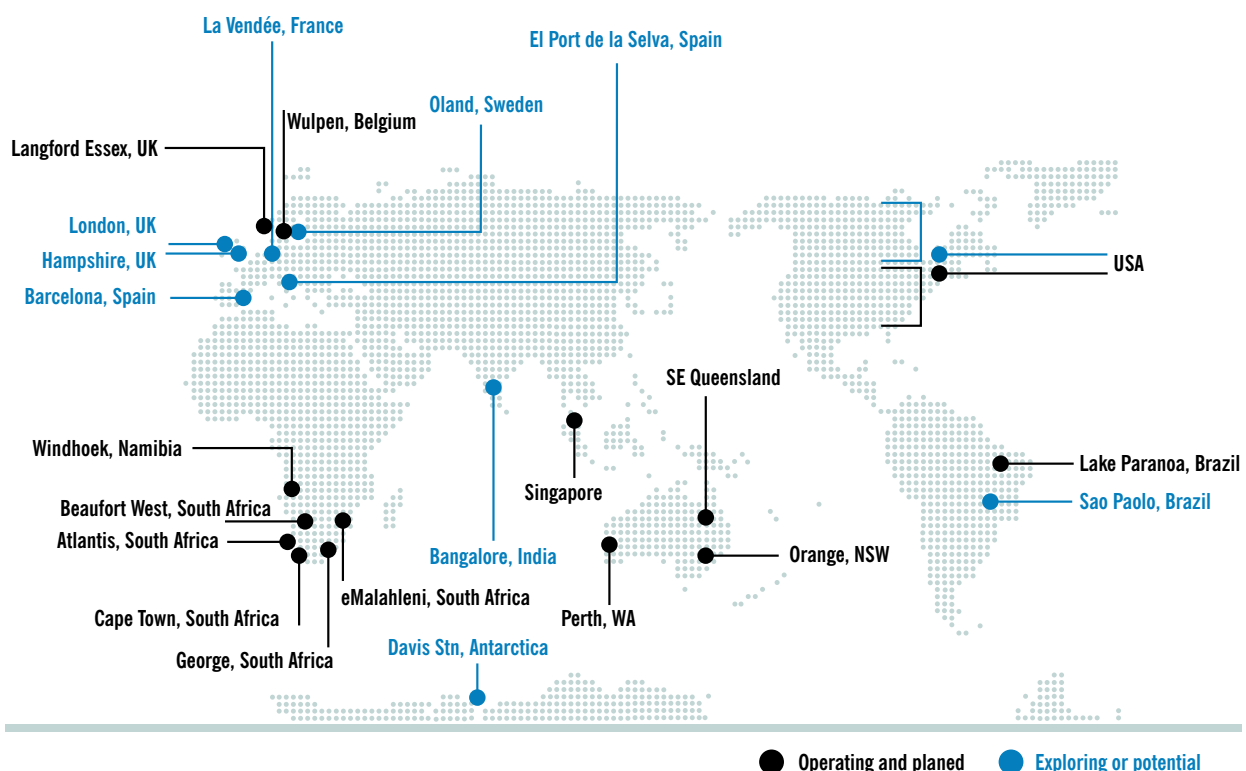
When wastewater is recycled, waste is left behind. This includes solids. We need to throw away this waste after the treatment process. How can we do this? We can:

- remove water content (through a heating process called thermohydrolysis) and then get rid of solids in a landfill

OR

- mix solids with other waste and get rid of some of the less harmful waste at sea. Thermohydrolysis is expensive and not good for the environment. It requires a lot of energy. Throwing away waste in a harbour also impacts the environment.

Global locations using purified recycled water for drinking





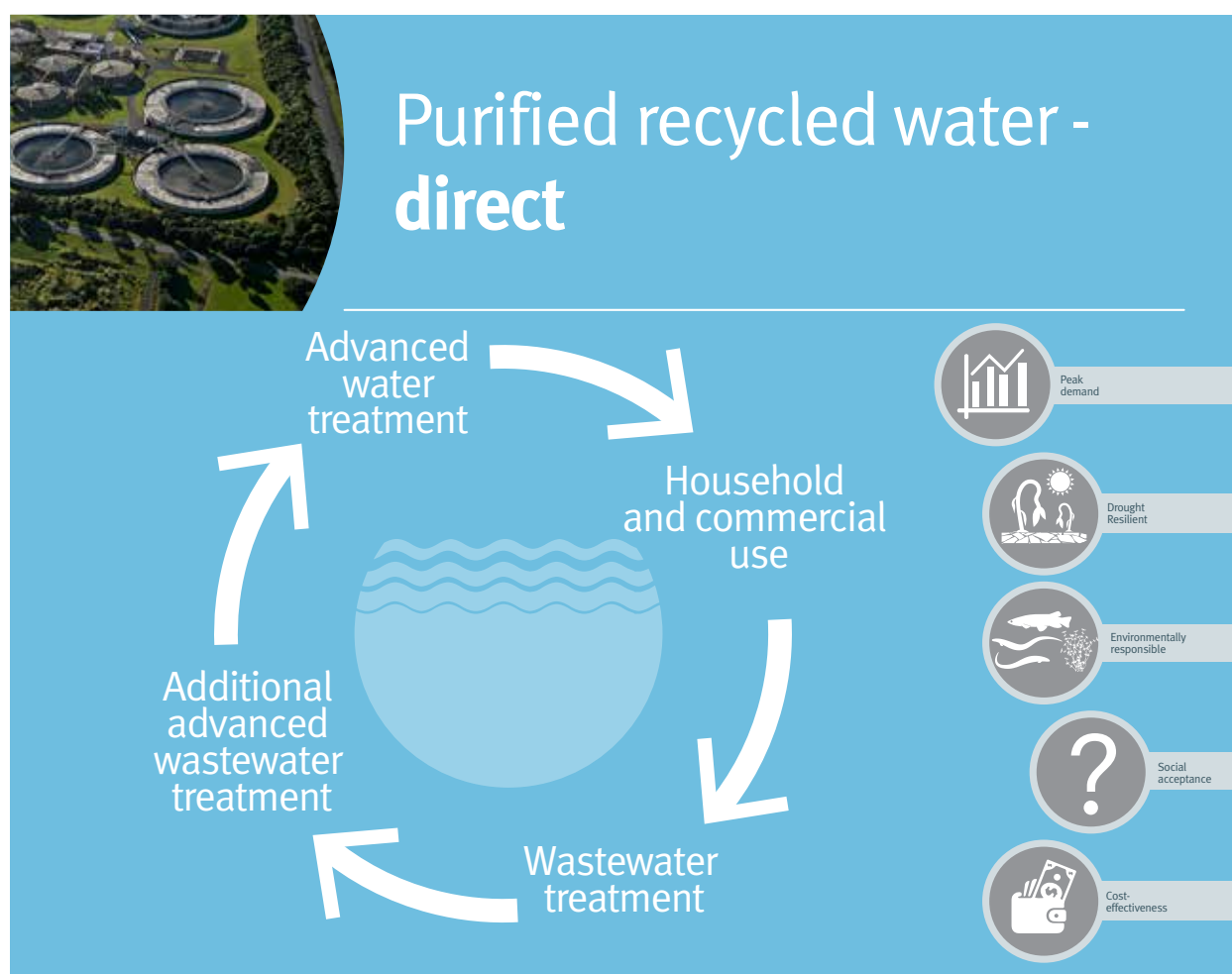
Notes:



Option 3: Direct purified recycled water for drinking

Direct recycled water means highly treated wastewater is directly supplied to the water network without storage. It has lower energy requirements, construction costs, and operational costs and is a workable solution where an 'environmental buffer' is not available.

This option requires sophisticated water quality monitoring techniques and assessment.



This is the lowest cost proposition of all the options but not the safest or most resilient value proposition.

<https://www.wsaa.asn.au/publication/unacknowledged-reuse>

Notes:



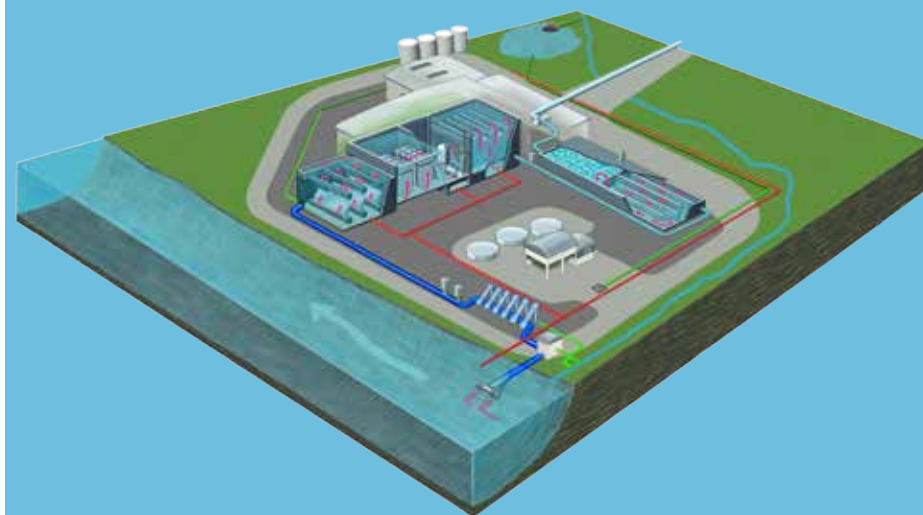
Option 4: Treated wastewater (not for drinking)

This is recycled water which is not for drinking. It is water that has been treated to a high standard at a wastewater treatment plant (WWTP). Often, this water is used for irrigating sports fields and parks and in construction for making concrete when drinkable water is not needed.

- Auckland plans to build more treatment plants. We can already use recycled water...
 - to suppress dust
 - to irrigate golf courses and sports fields
 - to manufacture concrete
 - in construction
- Costs depend on the size and location of the water, the level of treatment needed, and how close the plant is to where the water will be used. If the need for water is near an existing WWTP, treatment is less expensive.
- Schemes that recycle water are more likely to be made an economic reality if other water sources are scarce, if demand exists close to the treatment plant, and if the water will not be used for drinking. This is because the level of treatment required to ensure the water is safe for drinking is higher.



Purified - not for drinking



Peak demand



Drought Resilient



Environmentally responsible



Social acceptance



Cost-effectiveness

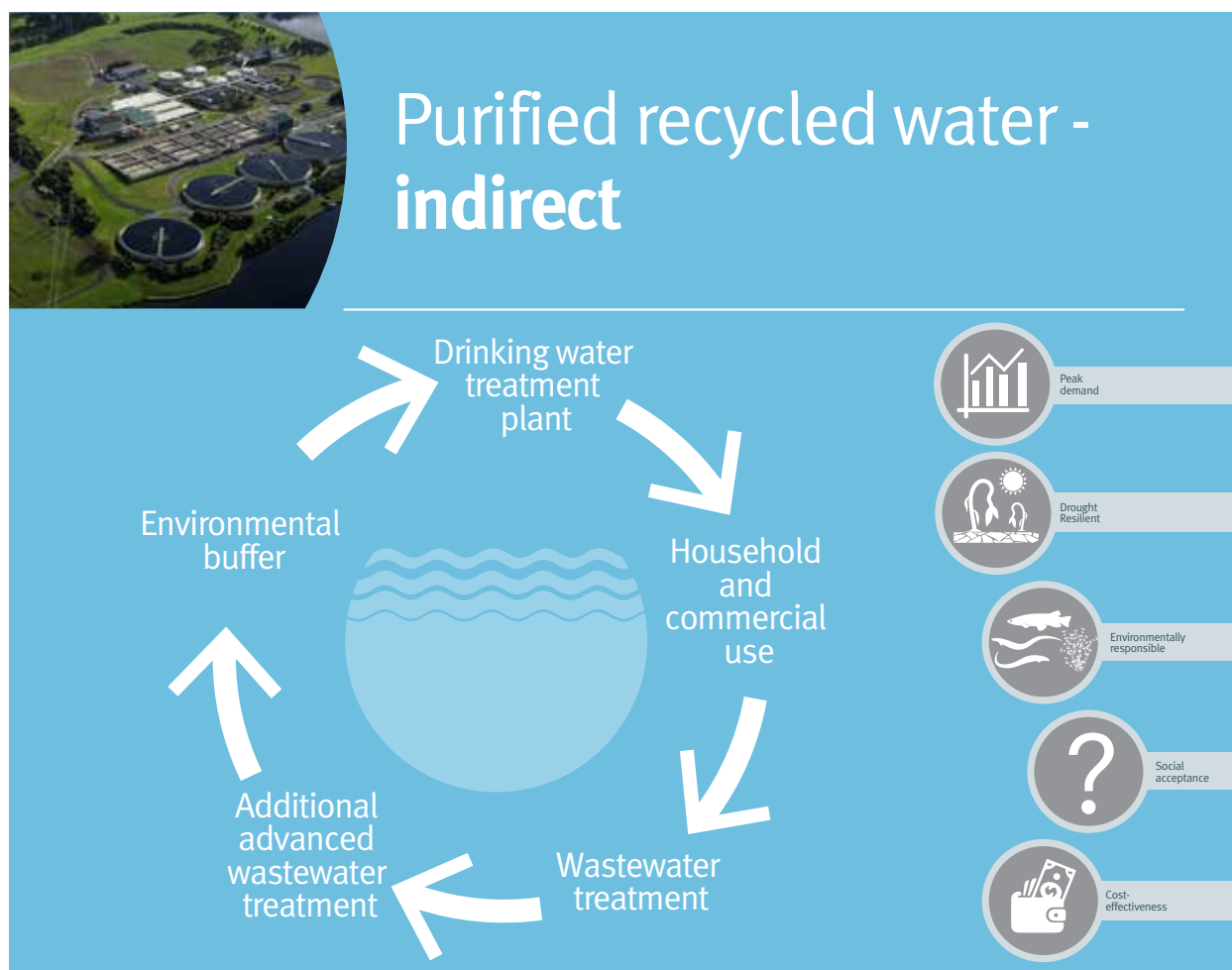


Notes:



Option 5: Purified indirect water (for drinking)

Purified recycled water (indirect) is recycled water from a wastewater treatment plant which uses an environmental buffer, such as a lake, river, or a groundwater aquifer, before the water is treated at a drinking water treatment plant and pumped to a storage facility (a reservoir, a constructed lake or an aquifer). The water is then monitored and abstracted to a water treatment plant where it is treated to a high level and added to the supply network.



Notes:



Option 6: Desalination

Desalination is treatment of seawater to enable it to be used for drinking. It removes the dissolved salts from seawater.

The by-product of this process is called 'brine' and needs to be disposed of. Desalination uses a lot of energy, so it is usually more expensive than other sources. However it is increasingly used as an option for drinking water in parts of the world where water is scarce.



Like the recycled options, desalination might be done in a number of different ways with many different costs or impacts on the environment.

Notes:

Costs

35





Costs (5 to 10 years)



Production capacity

How much water can it produce
(in millions of litres per day)



Carbon footprint



Local impact



Cost
How much does it cost to
build and operate? Levelised
cost/m cubed



Years of
growth
(1 year = 10 MLD)

One large source	Desalination	Stage 1: 75 MLD Stage 2: 150 MLD	TBC	brine	TBC	15
	Purified Indirect (for drinking)	Stage 1: 75 MLD Stage 2: 150 MLD	TBC	new reservoir built	TBC	15
	Purified Direct (for drinking)	Stage 1: 75 MLD Stage 2: 150 MLD	TBC	Concentrated waste	TBC	15
Smaller sources	Stormwater/Raintank solutions	Stage 1: 4 MLD Stage 2: 30 MLD	TBC	Improved resilience against flooding	TBC	TBC
Demand reduction	Purified (not for drinking)	TBC	TBC	Improved resilience, less wastewater flow to WWTP	TBC	TBC
Water efficiency options	Behaviour change Commercial	TBC	TBC	Increasing oversight and understanding of water use	TBC	n/a
	Smart-metering and advice	TBC	TBC		TBC	n/a
	Greywater systems/home re-use	TBC	TBC	Improved drought resilience	TBC	n/a
	Aggressive network renewals	TBC	TBC	Improved service levels, some disruptions	TBC	n/a
	Pressure management	TBC	TBC	Lower water pressure	TBC	n/a

The cost of the source(s) does not reflect what customers would be charged in the short term. The costs are there to show relative differences in the total cost of building and operating each source. Also, Watercare currently has a pricing principle of 'minimising change' so 'customers across Auckland should expect a stable and signalled price path to ensure annual cost increases are manageable.



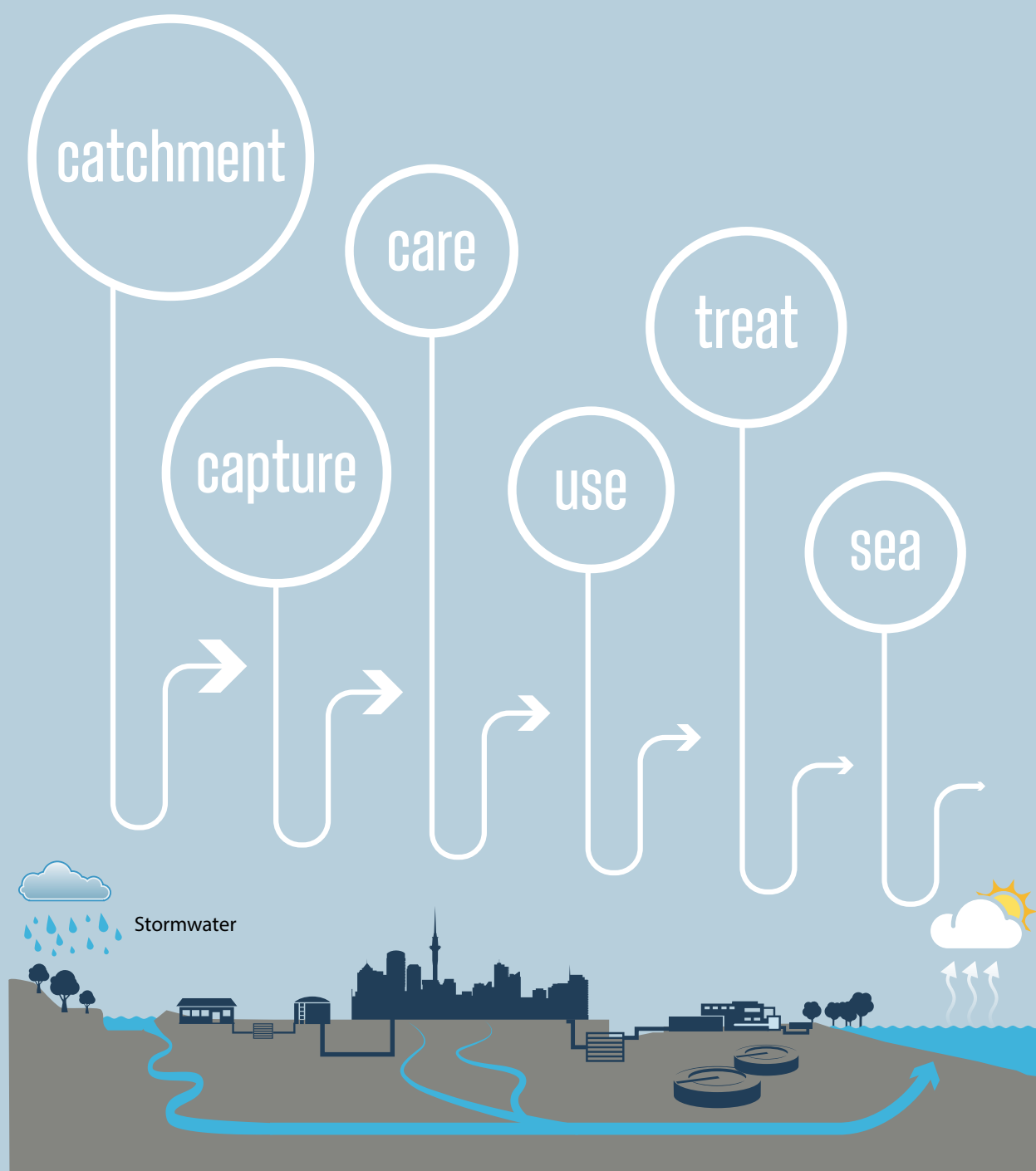
Notes:

The water cycle in Auckland





Water and the water cycle – current situation



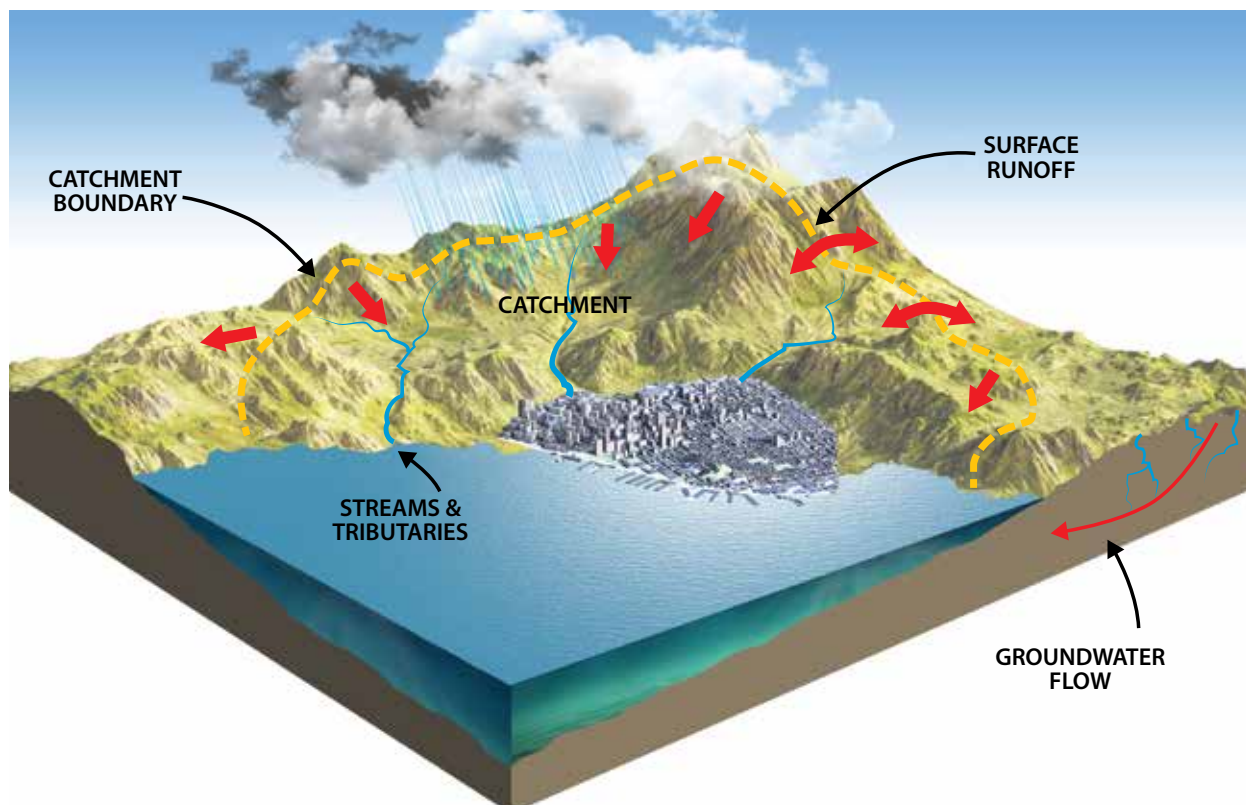
Auckland's water sources are reliant on rainfall and groundwater sources. The following section tells you what happens with that rain



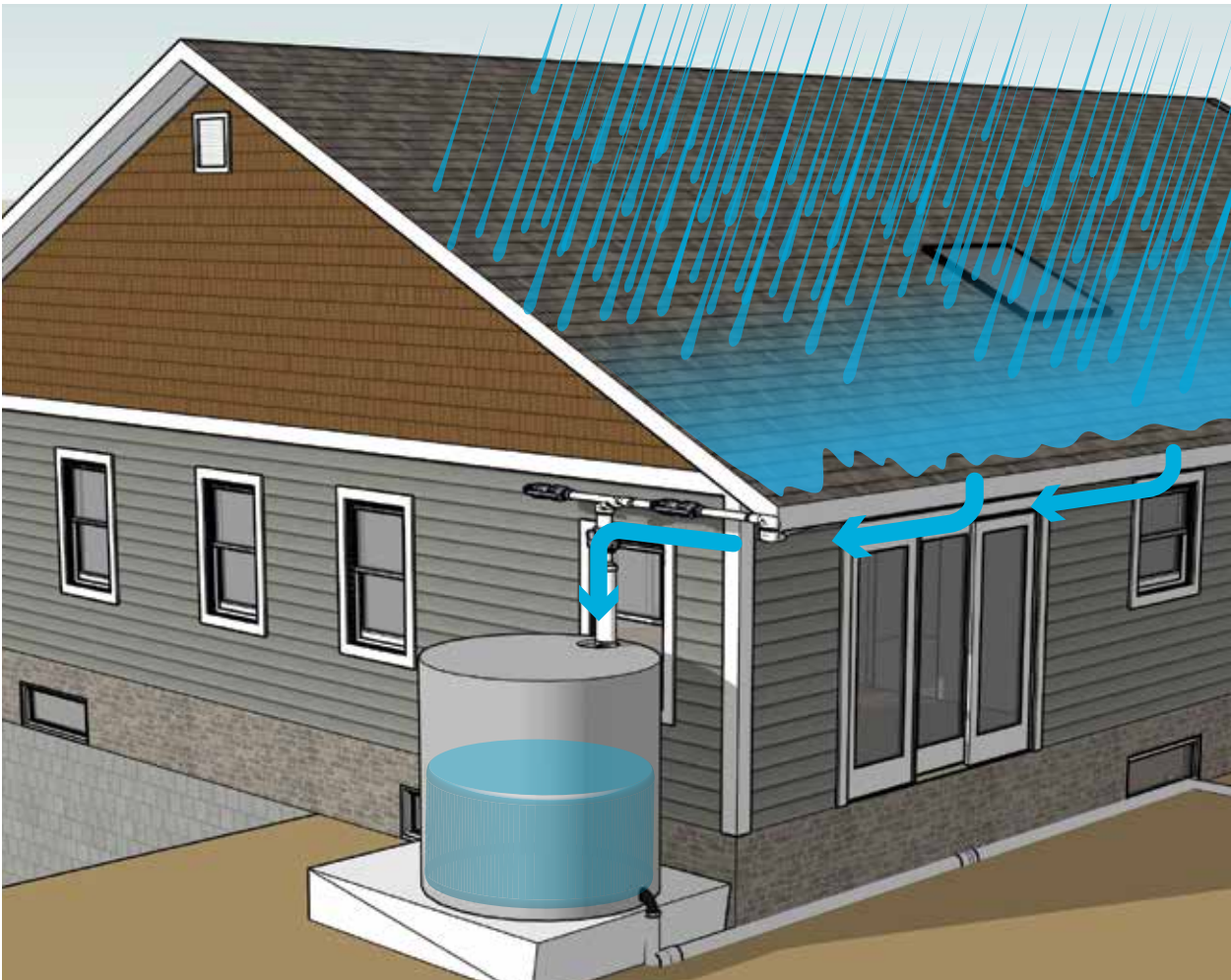
How we collect water through catchments

A water catchment is an area of land, either on the earth's surface or underground, that collects water and where water moves through.

Water collected in the Hunua and Waitākere dams flows through protected catchments that are mostly native bush, high up in the ranges. Streams and tributaries feed water to fill the reservoirs created by these dams. The Waikato river has a huge catchment area that starts with headwaters in Ruapehu, and flows out to sea at Port Waikato. The catchment makes up nearly one eighth of the North Island's land.



Large catchments provide the best chance of collecting a lot of water. We already have dams in the highest yielding catchments - the Hunua and Waitākere Ranges. So, alternatives should consider diversity of supply as a key criteria.



Roofs can be used for both catchment areas and for stormwater management to reduce the negative impacts of heavy rain and flooding. If rainfall becomes heavier but less frequent, we will need larger tanks to capture the same amount of water from roofs as we are able to collect today.

As more people begin to live in apartments we will not be able to supply enough water from rainfall for people living in urban areas as we are able to collect today. Our city's current intensification plan means that more people will be living in apartments, and these roofs are unlikely to be able to capture enough water to supply the people living under them.

Over summer, many rain tanks run dry. This means that while rain tanks are useful in many ways, including protecting our land and waterways and providing water for non-drinking uses, they do not take away the need for increasing the region's total water supply - especially in summer when our dams are historically at their lowest.



**The larger the catchment,
the more water can be collected**



How we treat water

Water safety principles

To ensure drinking water is safe, risks are identified at each step of the water's journey.

The risks can be:

- bacterial
- protozoal
- chemical



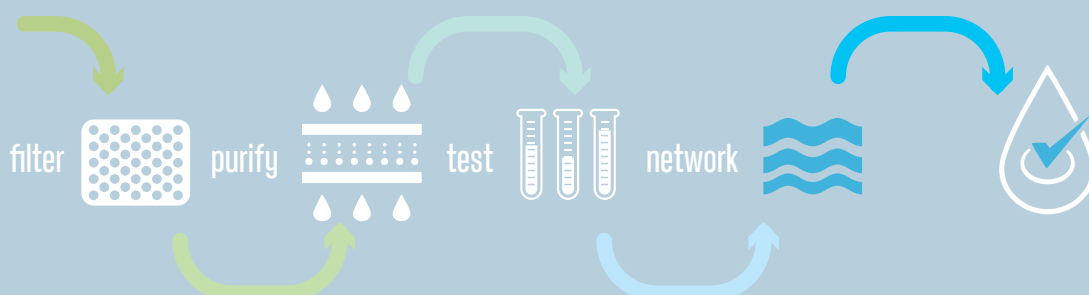
Regardless of the source, the principles of water safety remain the same.

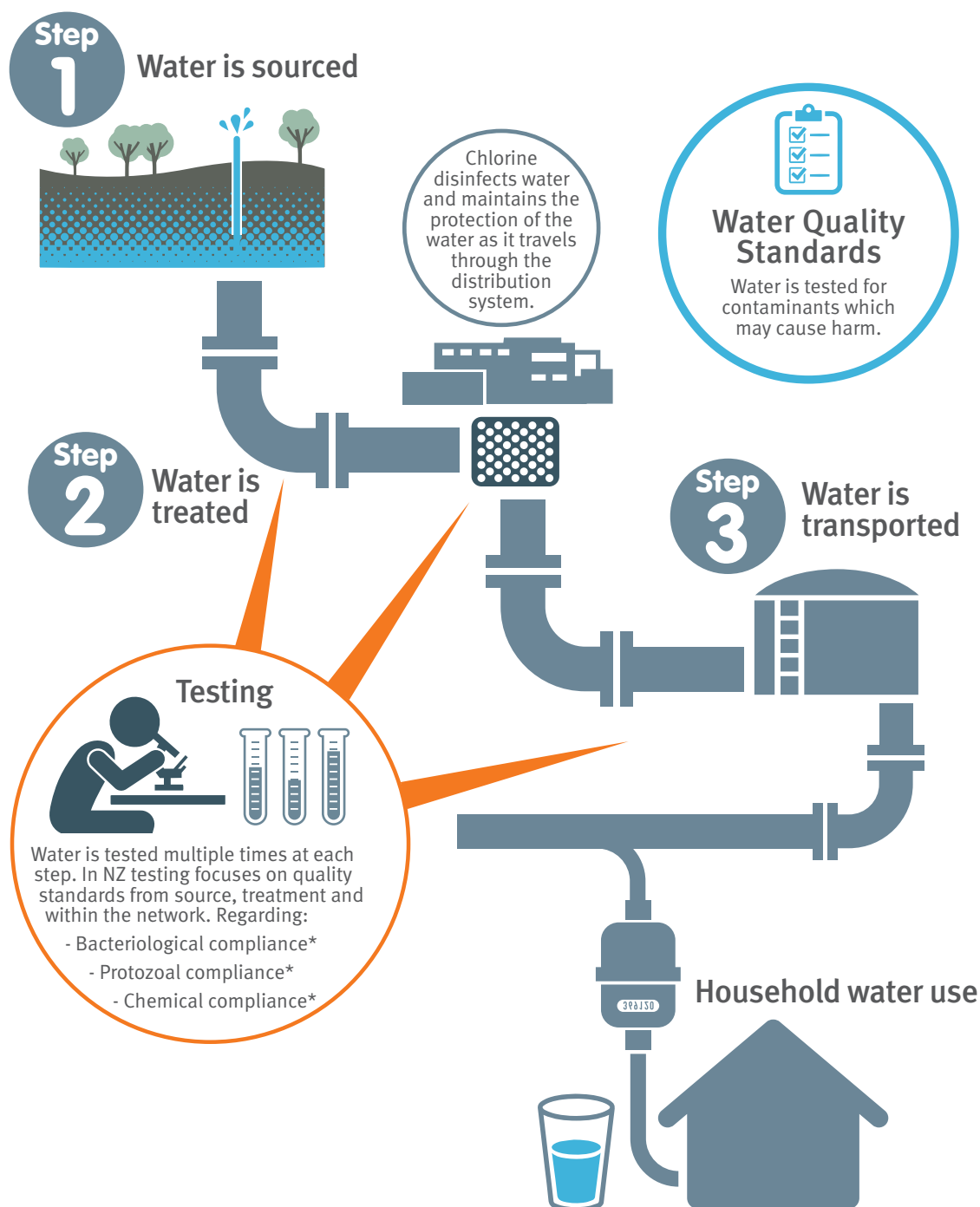
These are:

- Identifying risks from source to tap
- Creating protective-barriers to reduce risk
- Testing water quality frequently and accurately



Watercare has to treat water to the same standard no matter where it comes from, following national guidelines provided by the Ministry of Health and Taumata Arowai, our drinking water regulator. Water is tested for maximum acceptable values of contaminants which may cause harm. These standards are informed by the World Health Organisation) and are in line with international best practice.



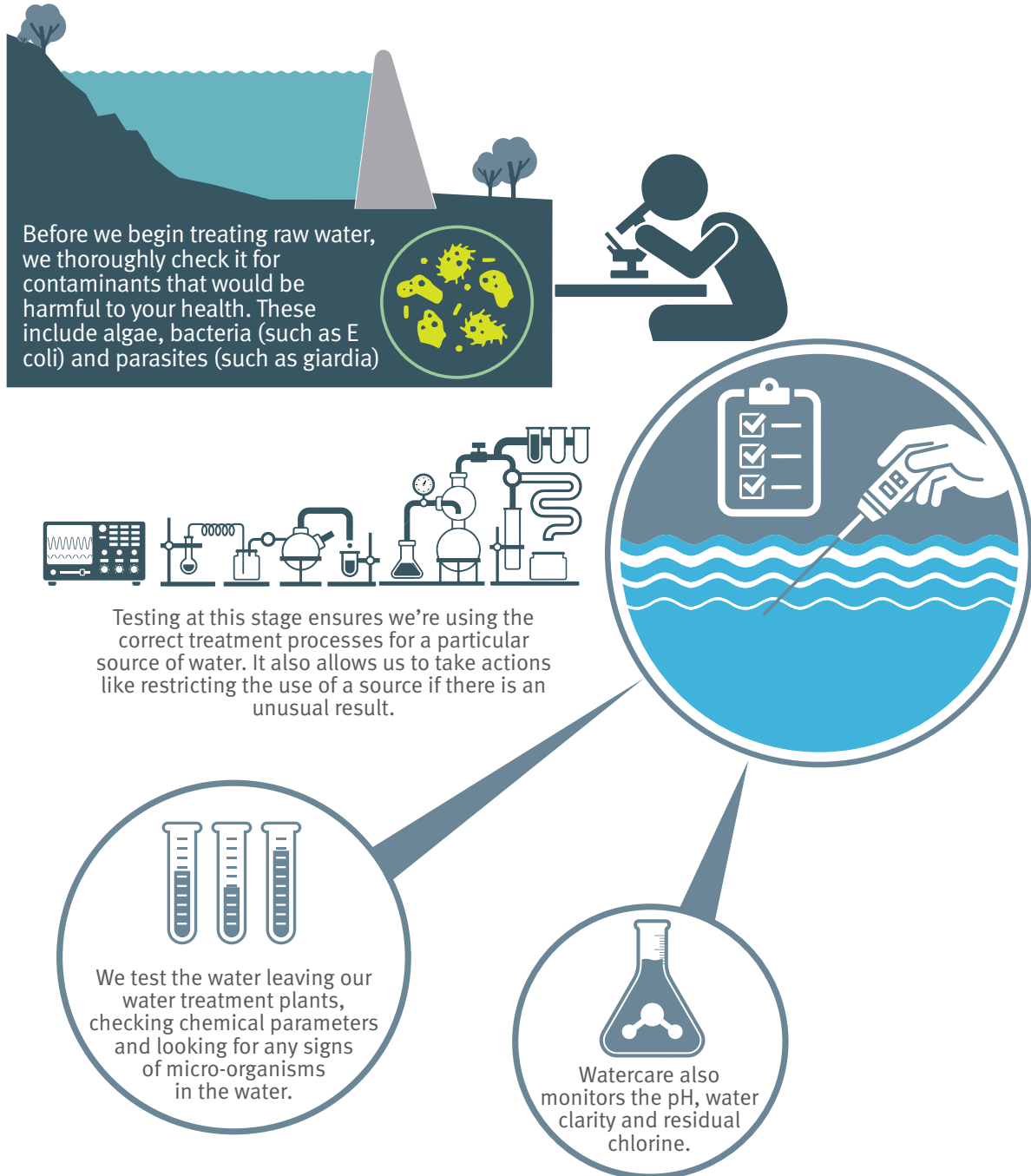


Water from all kinds of sources can be safe. But we need to identify all the risks, create protective barriers and set mitigations when barriers are breached. We also need to test at the source, during treatment and throughout the water network.



How we test our drinking water

Every day, technicians carry out an average of 250 tests on water samples from points across Auckland's water network. Watercare monitors and tests water quality throughout the process of collecting and treating water, and delivering it to customers.



Testing is crucial to any water safety process

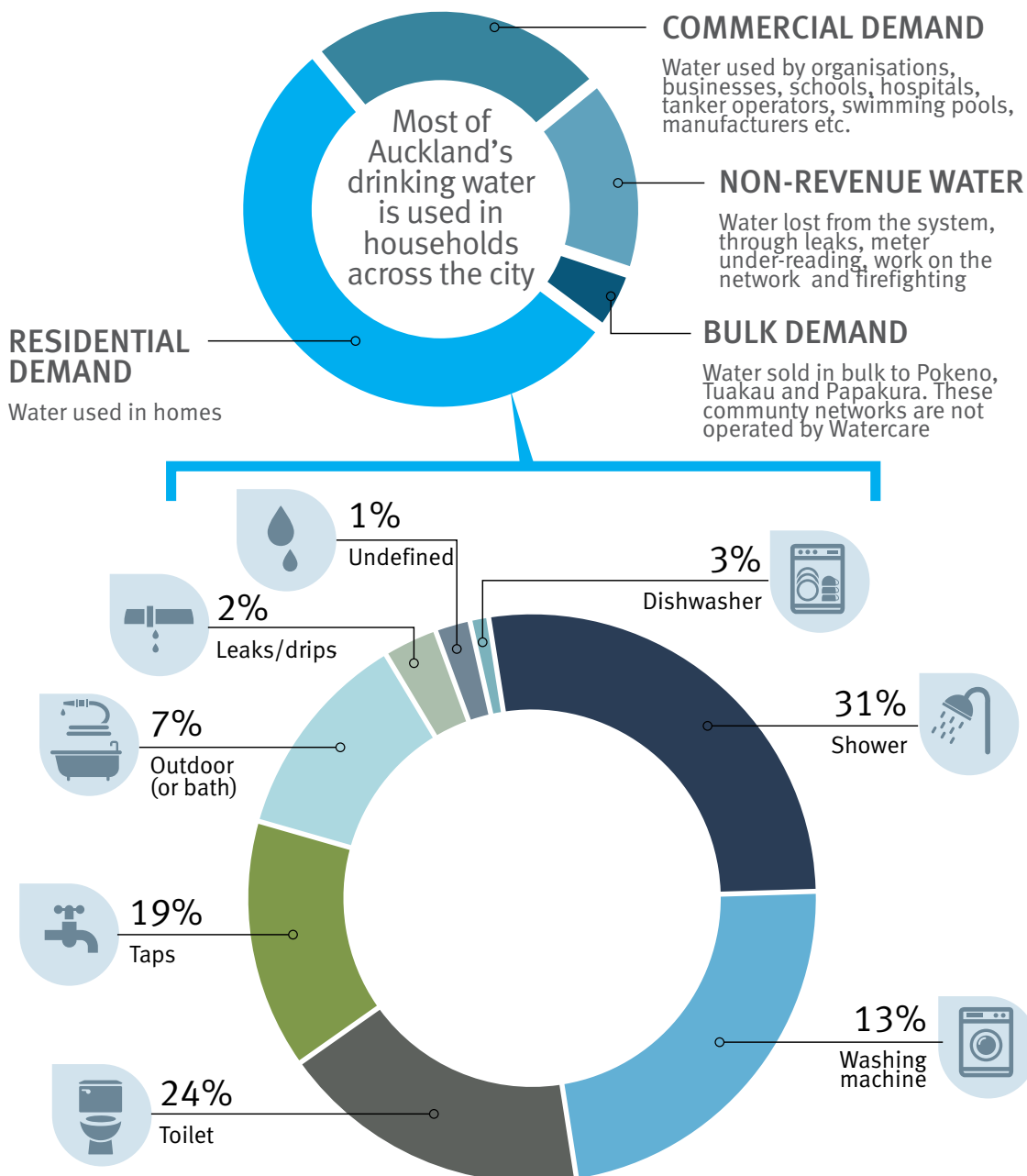


How we use water in Auckland

Water is used all across our city for different reasons, from drinking water in our homes, to flushing the toilet and for commercial purposes like filling swimming pools and food production. It is a precious resource because it is used in such varied ways.

Residential demand

Aucklanders use relatively less water per person than most other people in our country. Most of our water is used in the bathroom and laundry. We can reduce the amount of water we use by thinking about 'appropriate' use. We don't need treated drinking water for a lot of the things we use it for, such as watering the garden and flushing the toilet.



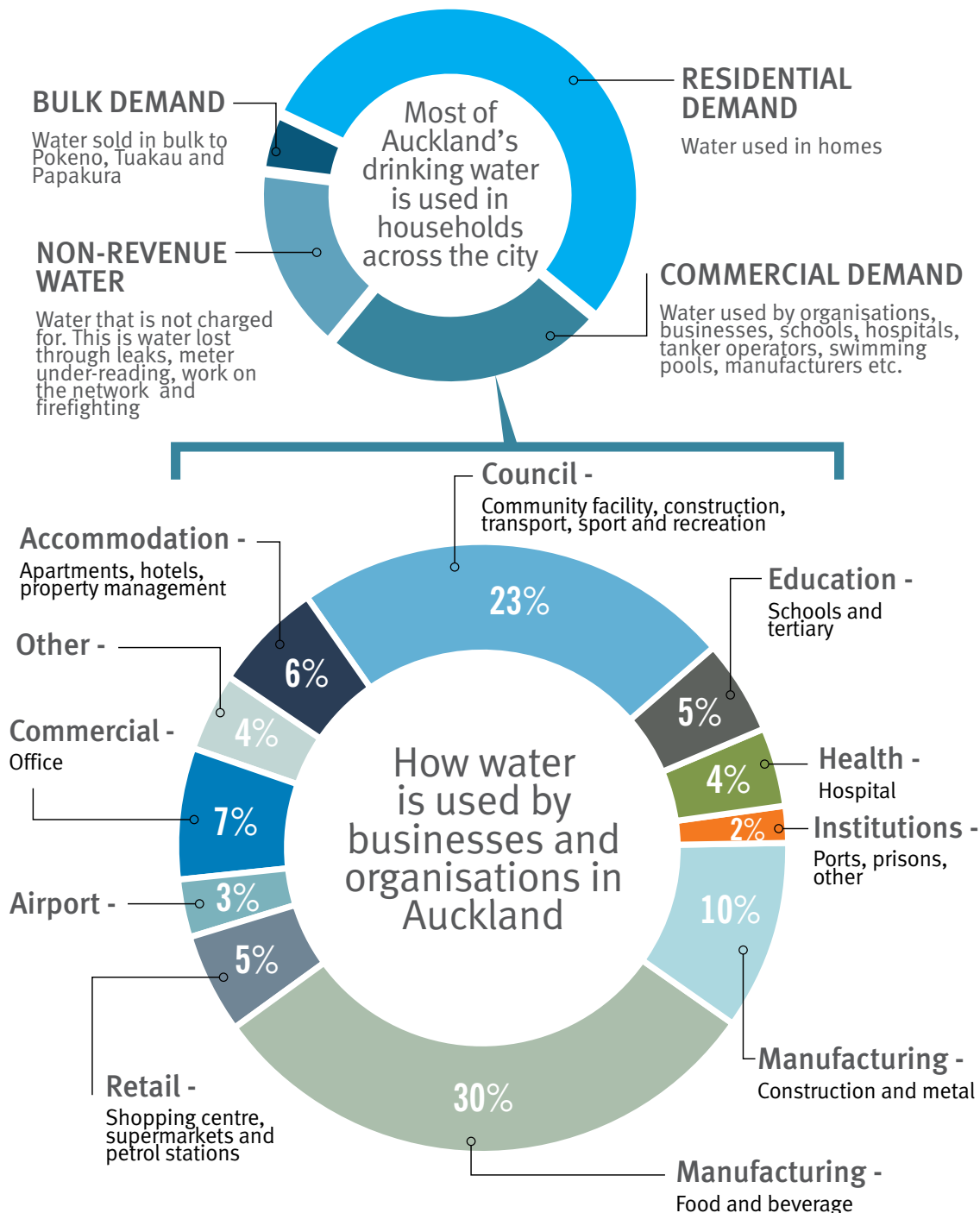
Most water is used in homes, and most of that is used in the bathroom and the laundry



How we use water in Auckland

Commercial demand

Commercial demand has stayed at a constant percentage of total demand.



We need to ensure that our businesses and organisations have enough water for the future



Notes:



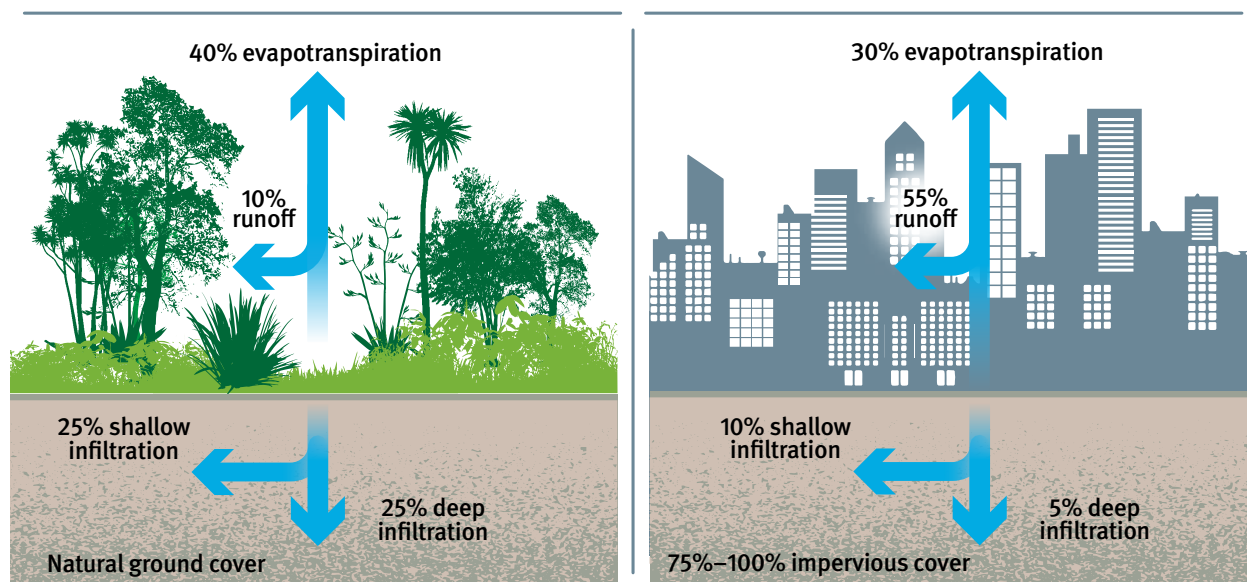
What happens to stormwater

Stormwater is the water that runs off buildings, roads and land and ends up captured in tanks, absorbed by land, or passing into waterways.



In less developed areas, water moves more easily through the soil and most water is absorbed into the land or evaporates before it can become or join a creek, stream, river or harbour. When the land gets developed, it can be covered in concrete and other surfaces which don't absorb water. In that case, when it rains most of the water runs off the land into waterways. Water can also pick up contaminants as it runs over different surfaces, like roads.

The Auckland Water Strategy conveys the importance of creating a 'sponge' city as urban development occurs as a way of being kinder to waterways. You can see some of this kind of design in some parts of the city (eg. Hobsonville Point).



Well engineered raintanks can be very helpful in protecting the land during heavy rainfall.



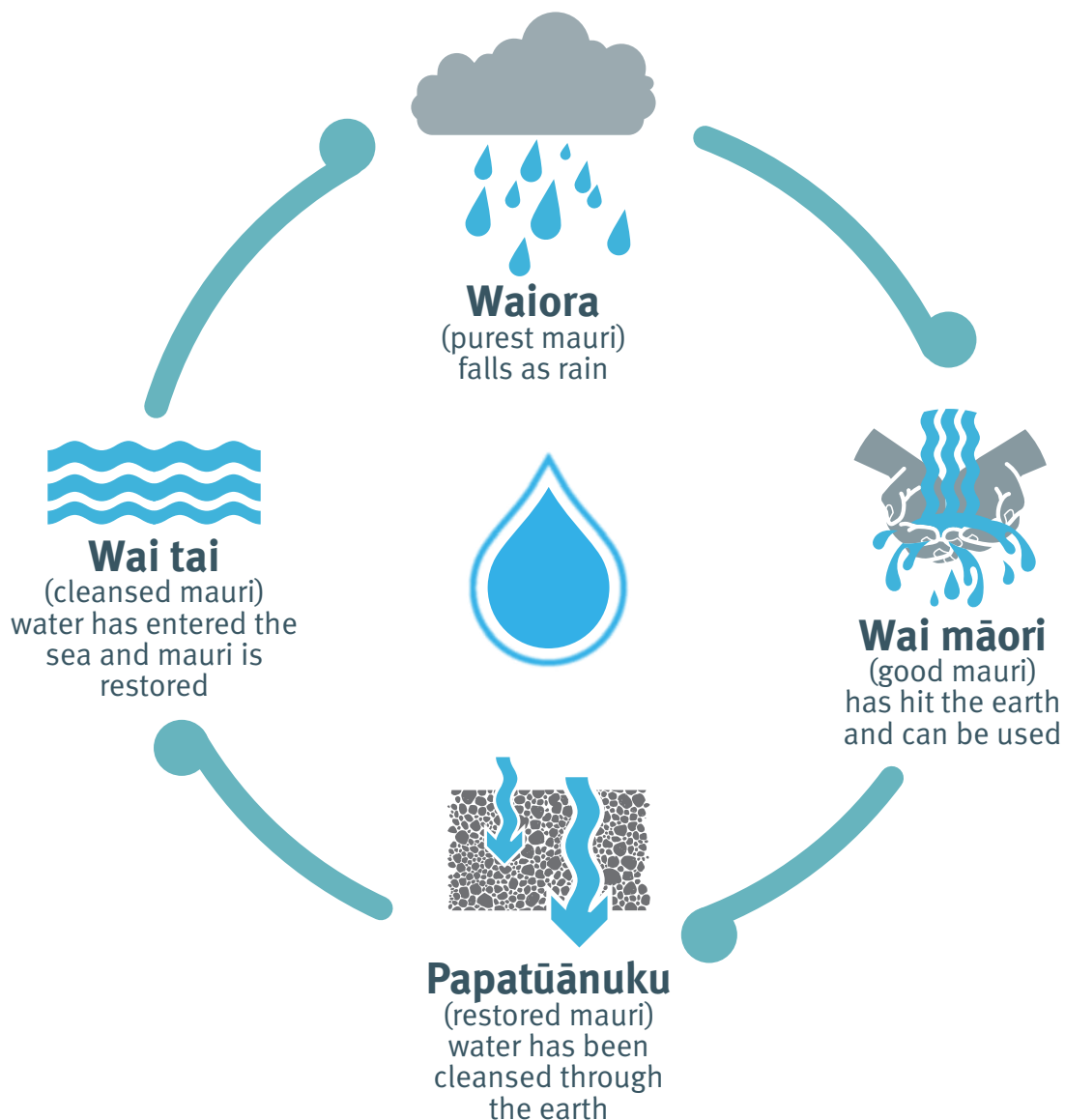
As land gets developed, less water is absorbed and more runs off into waterways



What happens to wastewater

Wastewater is water that has been used in the home, in a business, or as part of an industrial process, and runs through wastewater pipes to a resource recovery centre or wastewater treatment plant before it is allowed to enter the environment. Most of Auckland's wastewater is treated at Māngere and Rosedale wastewater treatment plants.

The disposal of human waste, especially to waterways, can be a highly emotive topic and is of particular interest to Māori. In Māori culture, human waste is 'tapu' (unsafe, dirty or bad) and this needs to be converted to 'noa' (safe, clean or good) before it makes contact with water.

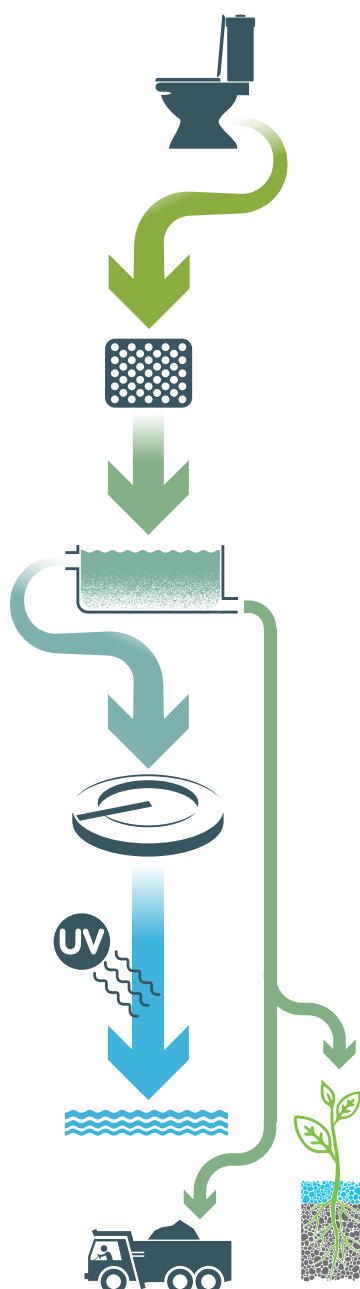


Contact with land (Papatūānuku, Earth Mother) acts as a natural filter and improves safety, making the wastewater safer to be used again



What happens to wastewater

Wastewater at Māngere and Rosedale is treated using these key steps:



- 1. Screening:** Raw wastewater goes through screens which remove solids greater than three millimetres. The solid mass left over is trucked to landfill.
- 2. Sediment removed:** The remaining liquid goes through large 'sedimentation' tanks where smaller particles like sand and grit are removed. The sludge sinks to the bottom and is separated from the liquid.
- 3. Bacteria:** The liquid moves to a 'reactor clarifier' where special bacteria live. The bacteria remove any contaminants which are harmful to the environment. Microorganisms eat the carbon and reduce the amount of phosphorous and nitrogen in the wastewater. Biological processes convert ammonia and organic nitrogen into nitrogen gas, which is harmless. No chemicals are required.
- 4. Disinfection:** The water is filtered, and is disinfected by travelling through channels of ultraviolet (UV) light.
- 5. Discharge:** Each day we discharge 410 million tonnes of water after it has been treated to a high enough standard that it can be released into the environment.
- 6. Leftover Solids:** The leftover solids are taken to approved landfills. In Māngere, the solids are deposited on Puketutu island to rehabilitate a volcano cone that was quarried away on the island.
- 7. Biosolids:** Wastewater can be seen as a valuable resource if managed well. Watercare has a biosolids strategy which looks to recover other useful parts of the residual solid waste that are useful as fertiliser, potting mix and in other contexts.



As populations grow, we are producing more wastewater requiring treatment and disposal



Notes:

Key information: How decisions about water are made in Auckland

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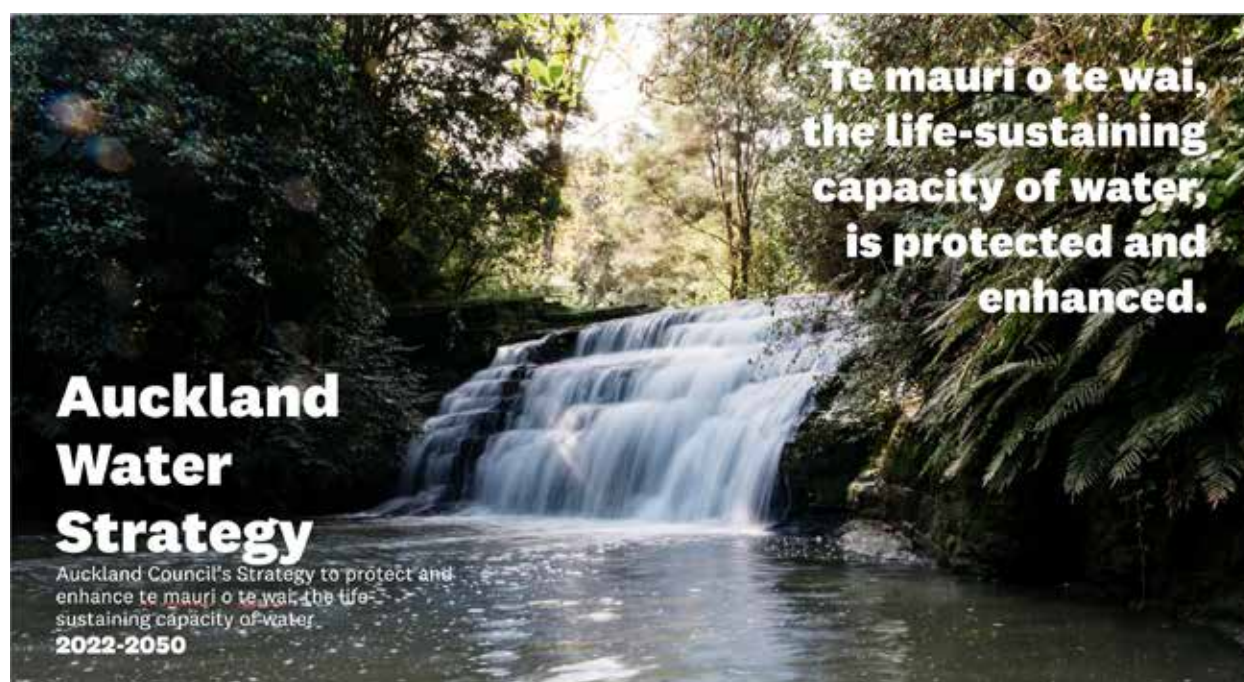
Te Mana o te Wai

Māori understand the interconnected nature of the water system. Water is precious in both a spiritual and a physical sense. It is a fundamental need.

During the citizens' assembly we will be of Te Tiriti o Waitangi/The Treaty of Waitangi, and the importance of honouring the Crown's obligations. A Citizen's Assembly in Aotearoa/New Zealand-specific needs to ensure it maintains key principles of the treaty in its design and intent, while still being representative of the community. We need to enhance our conversations with matauranga Māori knowledge of the water system.

Ki te ora te wai, ka ora te whenua, ka ora hoki te tangata.

(When the water is healthy, the land and the people are nourished.)



As New Zealanders, we respect the mana of our fresh water: te mana o te wai. Te mana o te wai means if we protect the health of our water and waterways, this in turn protects the health and well-being of people and the wider environment. It protects the mauri (vital essence) of wai. It is about restoring the balance between water, community and the wider environment. To give effect to Te Mana o te Wai, we must be respectful about how much water we take by not being wasteful. We need to take care of our rivers, streams and catchments in the natural environment. We must also be careful with how we discharge our treated wastewater, so that people can still swim and fish in the water. This is part of our way of life and our identity.

Te mana o te wai is about all us looking after the water and benefiting from it being healthy. The delivery of water and the treatment of wastewater are just two parts of a much bigger water system. We acknowledge that the state of water in New Zealand needs to improve. Enhancing the state of the Waikato River is the overarching principle for people in the Waikato, and Watercare is also committed to this. We need to bring back the mauri (vital essence) of our water.

Auckland Council is investing in ways to protect our waterways, and helping us reduce our water use and our impact on the environment. Other groups are also involved including volunteers, non-government organisations and treaty settlements.



There are national guidelines for our water. Te Mana o te Wai in freshwater management and the values of tangata whenua (the people of the land) inform these guidelines. These include

- The Ministry for the Environment's National Policy Statement for Freshwater
- The National Environmental Standards for Drinking Water
- The Auckland Water Strategy 2022-2050

We base our decisions on the evidence, we look for cost effective options, and we work to restore the mauri (vital quality) of our water and our water system.



**We need to work together to develop
an integrated approach to managing and
improving our water system**



The Auckland Water Strategy

The Auckland Water Strategy was published by Auckland Council in earlier 2022. It sets out the strategic direction for council whanau in relation to responsibilities and aspirations for Auckland's water services over the next 30 years. It provides a long term holistic view of water in Auckland, ensuring we act as guardians for the wellbeing of water now and in the future.



The Auckland Water Strategy is designed to guide the council to 2050. It covers land use change, population growth, climate change, working in partnership with mana whenua, and technological change. It directs investment and activities across the council group. The council has committed to ensuring that decisions made in alignment with the Strategy.

Strategic Shifts	
1. Te Tiriti Partnership	The council and mana whenua working together in agreed ways on agreed things
2. Empowered Aucklanders	The council working with Aucklanders for better water outcomes
3. Sustainable Allocation and Equitable Access	Prioritising mauri when using water, to sustain the environment and people in the long term
4. Regenerative Water Infrastructure	Ensuring Auckland's water infrastructure is regenerative, resilient, low carbon, and increases the mauri of water. It should be seen and understood by Aucklanders
5. Water Security	Creating water abundance and security for a growing population through efficient use and diverse sources
6. Integrated Land use and Water Planning	Integrating land use and water planning at a regional, catchment and site scale
7. Restoring and Enhancing Water Ecosystems	Taking catchment-based approaches to the health of water ecosystems
8. Pooling Knowledge	Fostering a shared understanding enabling better decisions for our water future

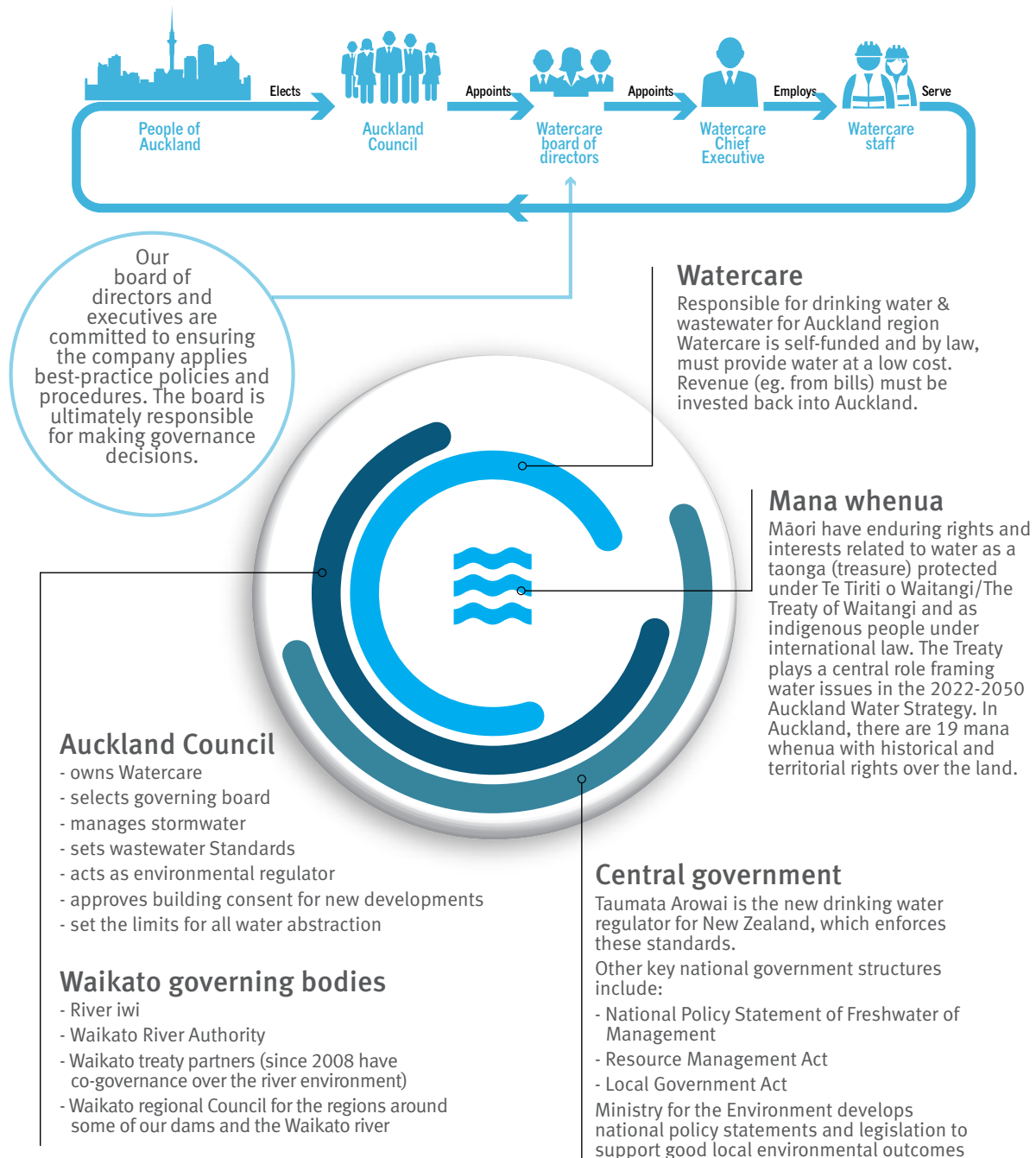


This Citizens' Assembly is Watercare's response to the need to bring Aucklanders along on our water journey. In this process, Aucklanders empowered with knowledge will be active in the design and implementation of water outcomes in our city.



Water governance in Auckland

Watercare is a council-controlled organisation, wholly owned by Auckland Council. The council appoints our board of directors, who in turn appoint our chief executive. Watercare does not pay a dividend to the Council.



Watercare works within a wider political system of ownership and regulation in alignment with the Auckland Water Strategy's vision to protect and enhance te mauri o te wai o Tāmaki Makaurau, the life-sustaining capacity of Auckland's water



About Watercare

Our purpose (Whakataukī)

Ki te ora te wai
Ka ora te whenua
Ka ora hoki te tangata

The wellbeing of our customers and communities depends on us looking after our water sources. Because when the water is healthy, the land and the people are nourished.

Our values

Respect
Excellence
Make it happen
Accountability
One team



All the money Watercare receives is used to operate, maintain and expand the water and wastewater network - Watercare doesn't make a profit.

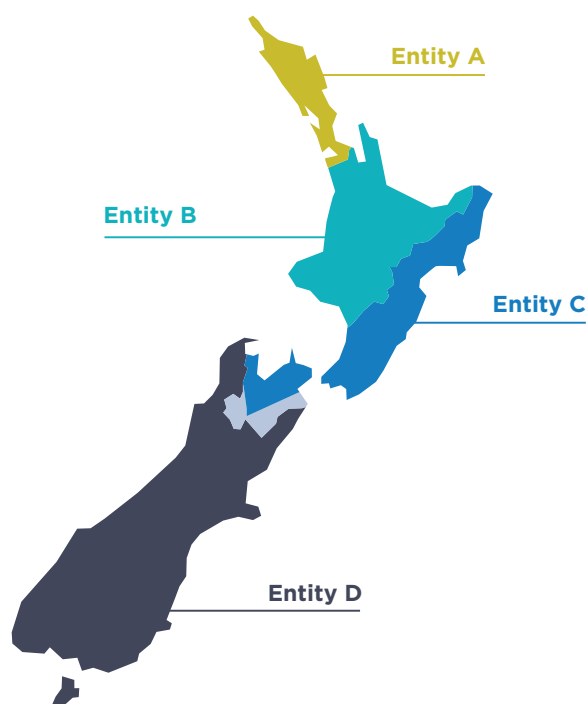


Three waters and the future of Auckland

Governance of water in Aotearoa New Zealand is changing. In 2020 the New Zealand Government announced the Three Waters Reform Programme in response to mounting evidence of the challenges facing three waters service delivery nationally, and an outbreak of waterborne diseases in 2016. As part of these reforms a new freshwater regulator, Taumata Arowai, was established in 2022. The reform programme also recommends the establishment of four new regional water entities which oversee three water services.

After reform, Watercare will be a part of Entity A, which covers the region from Auckland to the Far North. Regarding the question of reform and what impact this will have on the new sources of water you will be discussing in this citizens' assembly, please consider the following:

- If the population of Tāmaki Makaurau Auckland continues to grow, we will need a new source of water or an ongoing decrease in water use regardless of how the sector is structured.
- The population of Northland is growing as well.
- Auckland Council would retain many of the core roles in regulation and spatial planning and protection of the local environment.



There are arguments for and against reform but most are not relevant to this conversation about a new water source for Auckland. It is the number of people who will need water in the future, when they are going to need a new source, and how we are going to make that happen which matters here, not how the water system is regulated, or who manages it. Throughout this document we have tried to fairly represent the constraints on what can be developed through both central and local regulation.

One relevant difference that three waters reform would bring about is a change to debt and borrowing and how that would impact costs (which are indicated on page 35):

- Under the current financial arrangement, Watercare's borrowing ability is limited by Auckland Council's debt ceiling.
- This limit is called a debt-to-revenue ratio.
- With this limit, Watercare can only borrow 2.7 times its revenue.
- In the context of New Zealand water reform, this debt ceiling is likely to be extended.
- This means that the significant investment needed for the larger sources – indirect purified recycled water for drinking and desalination – pushes Watercare above the debt ceiling.
- In a reform context, the unit price of these larger sources would be lower, because (the entity previously operating as Watercare) would be able to borrow more than in the current setup.



Notes:

Contributors

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Stakeholders

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