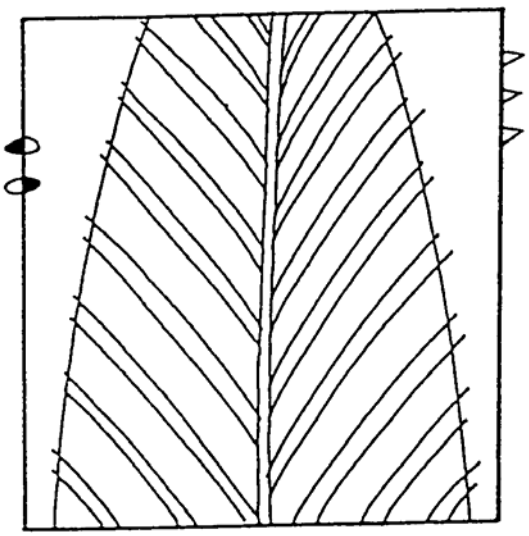
SAVING WATER



Waitakere City Council
Te Taiao o Waitakere

Contents

This chapter is part of the Waitakere City Council's Sustainable Home Guidelines. The complete set can be obtained through most libraries or from the Waitakere City Council, Private Bag 93109, Henderson, Waitakere City 0650, New Zealand, phone (09) 839 0400, email: info@waitakere.govt.nz.

The guidelines are also available on the council's web site: http://www.waitakere.govt.nz

Why save water?

We waste an enormous amount of quality drinking water. The average household in Waitakere in 2008 used about 162 litres of water per person per day. To reduce the need for expensive new water supplies such as new dams or the Waikato pipeline, the Waitakere City Council aims to reduce water use in the city by 25% per person by 2012. We are already on the way to achieving this target, which will save ratepayers' money in the long run, while making sure that we can meet the water needs of future generations.

At present the council spends about 22.2 million dollars a year on supplying water to its community. That sum is expected to increase dramatically over the next few years, so water saving will become more and more important in the future.

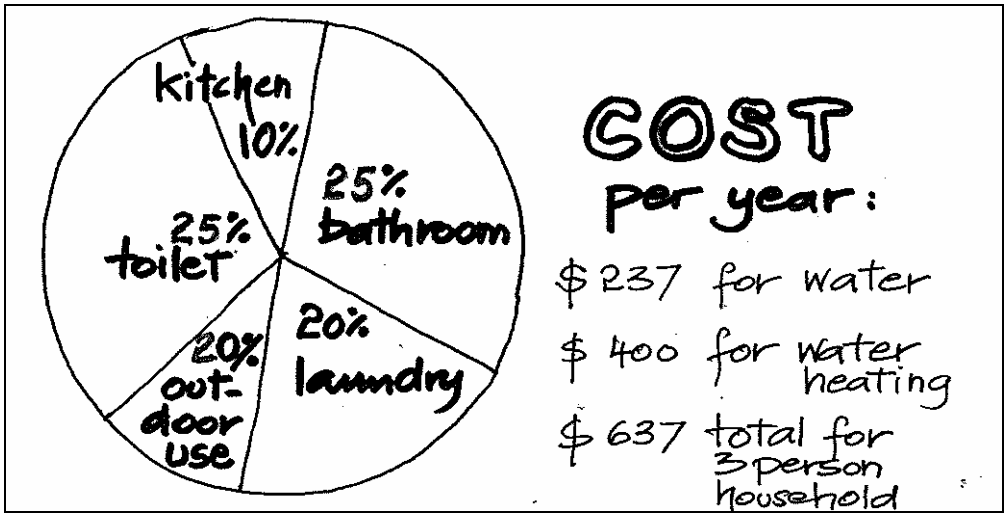
Providing and taking away water takes lots of energy as well. Water supply and wastewater treatment account for about 40% of the greenhouse gas emissions for which the Waitakere City Council is responsible.

So water efficiency means less water use, less energy use, less household cost, less waste discharged into the wastewater system and less cost for wastewater treatment. Wastewater costs Waitakere City ratepayers more than water supply does, and again the costs will rise because the existing system is reaching its capacity. So saving water has the potential to affect our costs from the wastewater network as well as the water supply network.

Fortunately you can save quite substantial amounts of water easily and at little cost. This chapter outlines what you can do to reduce your water bills. Water audits have shown us that you can achieve good water savings by doing lots of little things around the home and becoming aware of your water usage and the waste it creates. Using water efficiently and using water-efficient appliances and fittings both play an important role.

How much water do I use?

The pie chart below shows the average household water use of 485 litres per day, split into the different uses and the associated costs. The figures are for an average three-person household and will vary depending on lifestyle, time of the year (we use much more water in summer when it is in shortest supply) and how aware we are of water issues. To see how you compare, read your water rates bill, or call the council's EcoWater department: which can give you figures for your water use over the past three years.



- **25% toilet**
- **25% bathroom**
- **10% kitchen**
- **20% outdoor use**
- **20% laundry**

Costs and savings

It is difficult to give exact costs, savings and payback periods for water-saving features because they depend so much on your existing system, the plumbing fittings you choose and the way you then use them.

The main savings are likely to be off your electricity or gas bill (from less water heating) rather than your water rates, because water is still relatively cheap in our city. If you install a low-flow showerhead, for instance, you can save up to a few hundred dollars a year off your power bills. It would take between three months and four years to pay back its installation cost, depending on the model chosen and the previous level of water use. Comprehensive water-saving systems (using flow controllers) start at a few hundred dollars, and installers claim a payback period of less than two years for retrofitting an existing house. When building a new house the benefits of installing water-saving fittings are even greater, because they are generally no more expensive than ordinary fittings of similar quality.

And there are many simple ways of saving water that cost nothing. Adjusting a toilet to use less water, for instance, does not need to cost anything and you can save substantial amounts of water.

Simple ways to save water

Here are some things you can do right now without the help of a plumber. Most don't cost a lot and are commonsense approaches, but you should also weigh up your family's needs against wants and habits.

Check for leaks

This is easy. Turn off all your taps and water-using appliances and make sure that the toilet cistern has stopped filling. Now read your water meter – it is generally close to the street, probably in your front lawn under a lid. (If you cannot find it you can ring the council and we will tell you where it is.) Read it again after an hour – without using any water in the meantime. If the reading has changed you are losing water somewhere.

Another option is doing the same test but overnight. This is usually a better time to test your water meter because your water appliances will be used less or not all. This will give you a better indication if you do have a leak and will tell you roughly what volume of water you are using over an 8 hour period.

If there is a leak you will need to find it. Check for wet or greener patches on the ground outside – they might indicate leaking underground pipes. A leaking overflow pipe from your hot water cylinder will leave water stains on your roof or the outside wall of the house. If a leak is not obvious you might need to call a plumber to check it out for you.

Fix leaking taps and toilets

A tap that drips once every second wastes 1,000 litres of water a year, and a leaking toilet cistern can waste as much as 15,000 litres a year. Both are easy to fix by replacing the washer. You can probably do this yourself or if you are unsure consult a registered plumber.

A leaking toilet cistern is not always obvious, but you can check by putting a few drops of food colouring into the cistern and watching to see whether coloured water enters the toilet bowl. Most cisterns have an overflow pipe projecting through an outside wall, and it's worth checking this also.

Reduce the flush volume

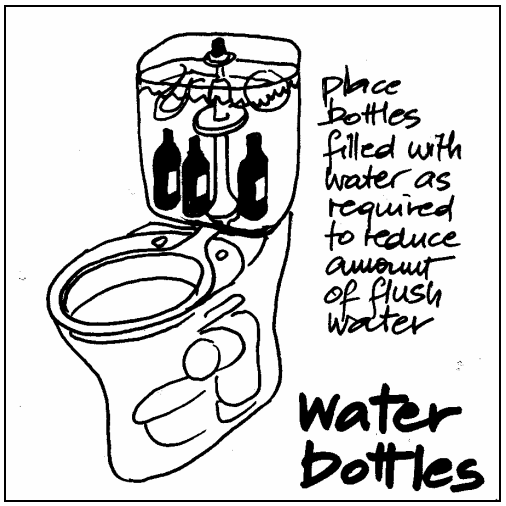
The easy way to avoid wasting water on toilet flushing is the "gizmo". The gizmo is free from the council, easy to fit, and will save about 40 litres a day in the average household.

Take the cover off your cistern. The pipe thing standing vertically in the middle is the underwater valve. Hang the gizmo – a little lead weight with a hook – on top of it. The weight of the gizmo will close the outlet as soon as you take your finger off the flush

button. Instead of automatically releasing the full cistern of water with each flush, you now control how long each flush needs to last.

Another option, for people who want to simply hit the button and leave, is to reduce the total capacity of the cistern. This is especially useful if your cistern is an older type with more than 6 litres capacity – most commonly 11 litres. There is generally a scale in your cistern that tells you how much water it uses. (Older types might use gallons – 1 gallon is about 4.5 litres.) You can reduce the cistern capacity by filling a couple of two-litre milk bottles with water and putting them into the cistern, with their lids on. This will reduce the volume in each flush. You can experiment with the number of bottles to get a satisfactory flush.

Alternatively if you have a ballcock cistern, you could gently bend the ballcock arm down to lower the filling level. Some cisterns have an adjustment screw that sets the water level.



Washing machines

An efficient top-loading washing machine might use 75 litres of water per wash; an inefficient one, 200 litres. Front-loaders use half to two-thirds of this. Choose the correct water level setting for the load, but bear in mind that a half-load setting uses more than half the amount of water. Use full loads of washing when possible. You can also reuse the rinse-cycle water on your garden or (with chlorination) for toilet flushing (see the chapter *Wastewater*).

Washing dishes and veges

A dishwasher covered by the multiple-A or star rating system uses water quite efficiently, although washing dishes by hand might use less water if you do it very efficiently.

Whether you wash by hand or machine, full loads are more efficient. If you must wash a few dishes, do it by hand using a small plastic bowl in the sink to reduce the volume of hot water needed. And never wash or rinse under a running tap – the water will disappear down the plughole at up to 20 litres a minute.

The same applies to vegetables – put a plug in the sink or use a bowl.

Showers and baths

Many people love their shower or bath, but large quantities of expensively heated water can be wasted this way. Try asking yourself the following questions:

- Do you want a long relaxing soak? A bath would be more efficient than a half-hour shower.
- Normally however, a five-minute shower uses a lot less water than a bath.
- If children have trouble judging how long a five-minute shower is, give them an egg-timer, or put the plug in the outlet drain.
- The hot water will arrive more quickly (with less water wasted) if you turn the control handle to full "hot" to start with.
- Instead of standing out of the water stream while you soap yourself you could turn it off. You don't need the water again till you rinse off.

Washing yourself

Don't leave the tap running while you brush your teeth. Water is going down the plughole at up to 20 litres a minute. Wet your toothbrush at the start; fill a cup with water to rinse, then turn the tap off.

The same applies to washing your hands or face. Put a plug in the sink. Particularly wasteful is the common practice of turning on a hot tap to do a quick hand rinse before the tap has time to run hot. You waste energy as well as water because the water is

replaced in the hotwater cylinder by an equal amount of cold water that needs to be heated.

Outdoor use

Use a bucket of water to wash your car and use the hose only when you're ready to rinse it off. A trigger hose gun will give you better control and save around 250 litres per wash. If you wash your car on the lawn you are watering the grass at the same time and pollutants will be filtered out by the grass and soil.

Garden irrigation can waste large amounts of water and is often unnecessary in Waitakere City's wet climate. There is a separate chapter *Gardening with Water* you can refer to.

Water efficient appliances

There are currently two schemes which rate the water efficiency of appliances and fittings. The older AAAAA rating scheme is being superseded (since July 2006) by the WELS star system similar to that for electrical appliances. The older scheme has up to five "A"s, the newer one up to six stars. The labels should be displayed at retailers -- if they are not, ask why. Even if an appliance or fitting is not rated, sales staff should be able to tell you how much water it uses.

An inefficient top-loading washing machine goes through about 200 litres of water per wash. If you don't believe this try catching the water as it pumps out. (A couple of 10-litre buckets are good for this, because you can empty one while the other one fills.)

Modern front-loading machines use less than half this amount of water. Front-loaders work differently: they give a gentler wash, using less water, energy and detergent, though they take longer to go through a cycle.

For washing machines and dishwashers that are water- and energy-efficient (and use less detergent) look up the rating websites, read the latest Consumer reviews, consult your appliance dealer, and read the *Household Appliances* chapter of these Guidelines.

New machines are covered by one of the water-efficiency rating systems – the more A's or stars, the less water is used. But there is often a trade-off between water efficiency and energy efficiency.

Of course you could also question whether you need water-using appliances such as dishwashers. If you have a small household you may be able to use less water by hand-washing dishes.

In-sink waste disposal units use a lot of water and put unnecessary load on the wastewater system. They also waste the valuable nutrients contained in organic waste, which can be composted and used in your garden.

Tuning up your plumbing system

You can fine-tune your plumbing system with fittings that will save water. These are things that need to be installed by a plumber. And because the choice of water-saving devices is dependent on water pressure and the other components of your system, we strongly recommend that you consult a competent plumber before you go out and buy any fittings or hardware. You may need to hunt for a plumber experienced in this type of work.

Get the plumber to visit your home, explain what you would like to achieve and work out the best solution with them. Then ask for a quote. This way your new fittings will suit your particular system and they will be installed properly. Ask for a guarantee for the work.

Remember that things that work well in one home might not work in others. Not all of the following measures will be suitable for everyone.

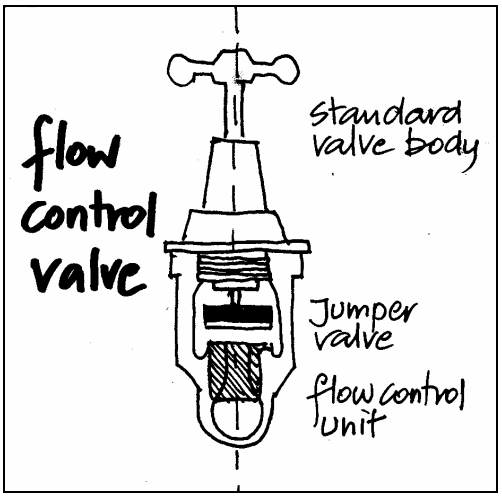
Reducing the flow

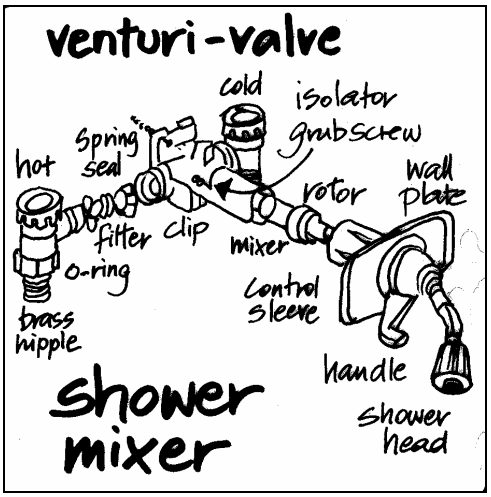
You can check the flow rates from your taps and showers by holding a 1-litre jug under them and timing how long it takes to fill. If it fills in less than six and a half seconds you are using more water than you need. Taps and showerheads can operate perfectly adequately at flow rates well under 9 litres per minute. Not only do you use less water, but you save money on electricity because about 30% of a household's energy is used for water heating.

Some taps and shower-heads have built-in restrictors. Otherwise there are a variety of devices you can fit to existing or new shower-heads and taps to reduce the flow.

Some companies offer comprehensive packages to retrofit homes with water-saving flow restrictors. This is an attractive option because the system can be tailor-made to suit your home and habits. These systems generally ensure that temperature and flow fluctuations are controlled, resulting in good water and energy savings while offering good performance.

Flow-restrictors are cheap and easy to fit. Restrictors should be fitted by a trained plumber, because the entire plumbing system needs to be considered to choose the appropriate restrictors. Problems can occur in systems with significant differences between hot and cold water pressure and some flow restrictors might not be suitable, so consult your plumber and follow the manufacturers' instructions.



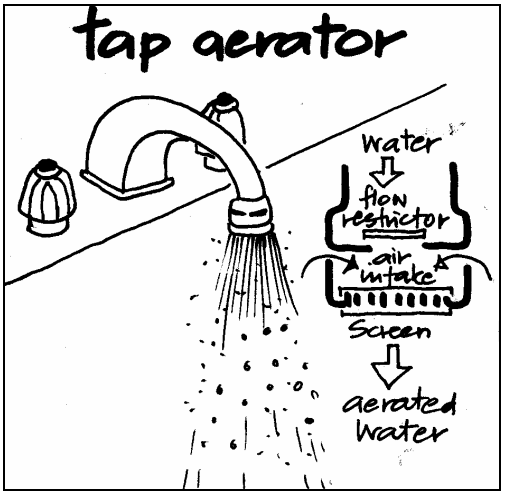


Low-flow shower fittings with in-built restrictors are especially designed to give a good shower with less water. However, it is not always suitable to just replace your existing fitting with the new one. Again, you should consult the manufacturer, especially if you have a low pressure hot water system or you are on tank water.

Single-lever mixers and taps save water by giving the user much better control, or you could fit a mixer that will not let the user pull the lever up to full capacity.

Aerators

Aerators are intended to improve the "quality" of the water stream, but by mixing the water with air they also result in a lower flow. They can easily be fitted to many kitchen and bathroom taps. Different aerators are available for internal and external (female and male) fittings and for different sizes – check if they will fit your brand of tap. You might be able to fit this yourself following the manufacturers' instructions.



Retrofitting toilet cisterns

You can retrofit 6-litre/3-litre (or better) dual-flush cisterns onto existing modern-type toilet bowls. Check with the manufacturer or your plumber that a new cistern will work with your bowl. If you're willing to hold your finger on the button for the length of the flush however, it would make more sense to fit a gizmo than to retrofit a dual-flush cistern.

Building water efficiency into a new home

When building a new home or doing extensive renovation, you should plan your plumbing system carefully to use water efficiently. All the solutions above, such as low-flow shower heads and taps, still apply, but savings can also be made in the way the system is set up.

The location of the hot water cylinder is significant. By minimising the distance between the cylinder and the point of use, less water (and time) is wasted waiting for the water to reach the desired temperature. It also means that less pipe is used, saving money and labour. Insulating the hotwater pipes will help a little to save energy but distance is generally the greater problem.

Although mains pressure is now more common in new homes and is seen to be more convenient, low pressure systems are cheaper and use less water. See also *Heating Water*.

Using rainwater for some of the major water uses, such as gardens, laundry and toilets, will drastically reduce your town supply water use – see the chapter *Using Rainwater*. And you can re-use water, for example recycling the water from your washing machine to use in flushing toilets – see the chapter *Wastewater*.

Whatever you decide, the most important thing is good communication with your plumber. Get the plumber involved early on in the selection of your systems and fixtures, especially if you expect the work to be guaranteed. Manufacturers and suppliers should also be asked for detailed information and it might be a good idea to get them to talk to your plumber. Again make sure that they will guarantee their product and service it if necessary.

Ask your plumber to design the entire system (with you and your architect) and specify flow rates and maximum levels of fluctuation for fixtures.

Pressure limiting valve

A pressure limiting valve is used to reduce the pressure at the point where the town supply enters the property, generally by the water meter. It reduces the pressure to all outlets. This is different from the valve that is used to reduce the pressure before water enters your hot water cylinder. The council will install one free on request.

New toilets

Specify 4.5/3 dual-flush toilets (or better – see the water-rating website). If you need to fit a urinal specify the waterless type.

New fixtures

Rather than buying a standard fixture and adding a flow restrictor, it is better to buy new fixtures with built-in flow restricting devices because they are designed to give good performance with low flow. If you have a low-pressure hotwater system you need to check with the manufacturer whether the fixtures are suitable.

Disabled people can have problems operating some fittings, resulting in wastage of water. Fittings that are user-friendly should be used in this case. Specialist advice can be obtained from good plumbing suppliers.

Greywater recycling

Water you have used for washing clothes or showering does not need to become wastewater. You can re-use it for toilet flushing or in the garden. "Off the shelf" systems are available for this. The *Wastewater* chapter gives more detail.

Non-sewered areas

Septic tanks can fail when high volumes of water are discharged. Water saving is especially important with a septic tank: it will reduce the risk of failure and resulting environmental pollution. In-sink disposal units are banned for septic tanks. 6/3 dual-flush toilets are mandatory unless you use a water-saving option such as a composting toilet. A composting toilet is an excellent option for those outside the sewered areas, although they do require some change of behaviour in the user. Also available are several other options that use very little water, separate solid and liquid waste, and offer water recycling options. See the *Wastewater* and *Using Rainwater* chapters for details.

Washing machines cause frequent problems with septic tanks, because they discharge large amounts of water suddenly. It is better to space washes over time than to do several loads in one day.

Commercial buildings

In commercial buildings water efficiency can lead to substantial savings for the building operator. Many of the solutions outlined above will apply, but there are additional options you should also consider. Some brief examples follow. More detailed advice for individual cases is available from the council.

Urinals

Flush urinals can cause enormous water wastage if they leak or are set wrongly. You can save large amounts of water and money by checking and maintaining flush urinals regularly. If not under manual or sensor control they should be set to flush once or twice an hour, and turned off outside working hours. Or you could install waterless urinals.

Taps

Depending on the situation, sensors or taps that will turn off automatically can be installed.

Maintenance

Good maintenance will ensure that no water is wasted through leaks and faulty appliances. Make sure that occupants and cleaners know who to contact about leaks.

Further information

Advice at the Waitakere City Council:

Phone the call centre 09 839 0400
Ask for: Eco Design Advisor
EcoWater Education
Duty Planner

In print

Green Architecture, Brenda and Robert Vale, 1991, Thames and Hudson Ltd, London.

Your Home Technical Manual, Australian Government. Comprehensive printed resource, much of it relevant to New Zealand.

"Saving Water: Free Changes You Can Make" – Brochure available from the Waitakere City Council.

On the web

http://www.waterrating.gov.au for Water Efficiency Rating Scheme (star ratings).

http://www.smarterhomes.org.nz is a mine of up-to-date and independent information. Designed for the general public, it's easy to use, has case studies, and includes features such as Homesmarts, a calculator you can use to find information relevant to your needs or simply to run a home-health check.

If there are questions you can't find answers to on Smarterhomes, www.level.org.nz goes into more depth and is aimed at the design and building industries, with drawings and links to Building Code compliance documents.

Eco-building Products and Services Directory, Building Biology and Ecology Institute, phone Auckland (09) 376 6767, Wellington 0800 223 272. This is updated regularly and can be obtained from the website www.ecoprojects.co.nz.

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