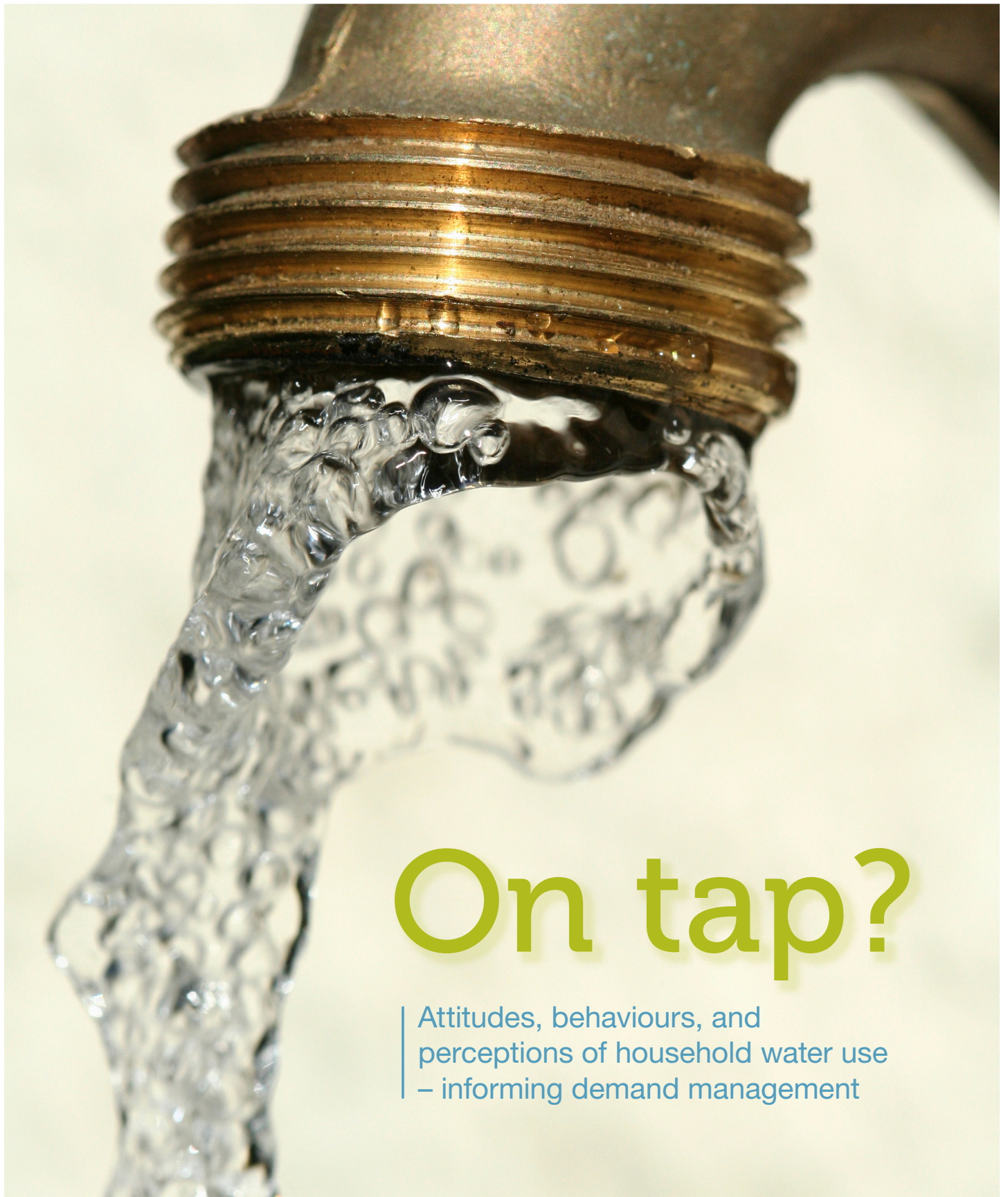




Ministry for the  
**Environment**  
Manatū Mo Te Taiao



# On tap?

Attitudes, behaviours, and  
perceptions of household water use  
– informing demand management

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# Executive summary

This report summarises research on household water use, to inform demand management strategies and enable successful communication with the public.

It focuses on household water use from the householders' perspective, presenting existing and new consumer research on attitudes to water, population segmentations, behaviours, and barriers and incentives to action.

It includes the synthesis of three pieces of existing research, bringing together recent public surveys on household water use, and identifying common themes. The existing research was conducted independently in Auckland, for Watercare Services; Wellington, for Greater Wellington Regional Council; and at a national level for the Ministry for the Environment.

It also includes new qualitative research on:

- attitudes to water metering
- selecting a new washing machine
- watering the garden.

## Summary of findings

There are many contradictions in New Zealanders' attitudes and behaviours relating to their household water use.

To generalise, New Zealanders regard water as 'precious', but also believe it is plentiful and limitless in this country. New Zealanders have a fundamental belief that waste is bad – but they also believe they have the right to use water freely and without restriction.

Water use appears to be very personal to New Zealanders and to be part of their way of life. So while they believe that wastage is 'bad', they are reluctant to hear messages asking them to modify behaviours, because they see this as an intrusion into their personal life. For instance, while focus group participants understood that two-minute showers were part of a community response to water shortages, they believed that the personal freedom to have a long shower was an important aspect of being an urban New Zealander.

On the other hand, many New Zealanders have been brought up on tank water or in rural areas where water is not so plentiful, and therefore have the ability and knowledge to adapt their behaviour when there are shortages. But they view these as temporary adaptations in times of need. Many New Zealanders are frugal and believe that water should not be wasted. But there is not a perceived need to conserve water, "because it rains all the time", and therefore water is viewed as plentiful.

Many New Zealanders do not have a sense of how much water they use, or which activities contribute most to overall household water use. And while most New Zealanders are engaging in some water-saving behaviours, this is often due to their aversion to wastefulness, rather than any environmental motivations. Habits such as turning off the tap when brushing teeth, or conservative garden watering practices, are part of people's lifestyles and do not necessarily relate to any conscious thoughts about their water use. One-off actions, such as purchasing a new washing machine, are more likely to take water use into account than unconscious habits, but only as one of many factors considered.

Water provision is seen by some as a fundamental human right and is a highly emotive issue. Any plans therefore to introduce instruments such as household metering are viewed as a

challenge to social justice and equity. A major theme evident in the research was a wariness of the motives for introducing instruments such as water metering.

## **Applying the research to demand management**

Because the introduction of demand management interventions is likely to impact on households, an understanding of public attitudes, behaviours, and perceptions of household water use is important for successfully communicating with the public.

The following key principles for communicating with the public came out of the research. These are detailed in section 6: Applying the research to demand management.

- Don't assume understanding of the need to conserve water.
- The environment is not a key motivator.
- Appeals to frugality are likely to be more successful.
- Saving money is important.
- Making one-off actions is easier than changing habits.
- Water use behaviours can be very personal.
- Show people what wastefulness looks like.
- Don't blame residents for water problems.
- Use trusted messengers.

# 1. Introduction

As demand for fresh water increases, demand management strategies are becoming increasingly important. The benefits of water demand management include cost savings through deferring the need for investment in new infrastructure, savings in the treatment and supply of water to households, and savings in wastewater management through reduced flows.<sup>1</sup>

There are a range of possible approaches to water demand management, including but not limited to (Lawton et al, 2008):

- water loss control and asset maintenance
- water-efficient technologies
- regulation
- non-regulatory policy (eg, education and outreach)
- economic instruments.

Because the introduction of demand management interventions is likely to impact on households, an understanding of public attitudes, behaviours, and perceptions of household water use is important for successfully communicating with the public.

This report summarises research on household water use, with the purpose of informing demand management strategies and enabling successful communication with the public. It focuses on household water use from the householders' perspective, presenting existing and new consumer research on attitudes to water, population segmentations, behaviours, and barriers and incentives to action.

## 1.1. Methodology for developing this report

This report was developed to summarise research on household water use in New Zealand, to make it more accessible to those developing policy. This should save councils and other organisations from duplicating research projects with similar objectives, but also provides a basis for more targeted local research if required. It includes the synthesis of three pieces of existing research, combined with new qualitative research on three specific topics of significance.

The synthesis of existing research makes up the core of this report, covering attitudes to water, population segmentations, behaviours, and barriers and incentives to action. The synthesis was developed primarily to bring together recent public surveys on household water use, and to identify common themes. The existing research was conducted independently in Auckland, for Watercare Services; Wellington, for Greater Wellington Regional Council; and at a national level for the Ministry for the Environment.

Each of these existing pieces of research covered a range of topics; however, the information selected for inclusion in this report has been limited in scope to:

- research on households
- attitudes and behaviours with regard to water, rather than other environmental issues (the exception to this is in section 3: Population segmentations – in some instances general environmental attitudes were used in developing the segmentations, so these are included where relevant)

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<sup>1</sup> For further information on the benefits of demand management see Lawton et al (2008), and Stewart (2009).

- water demand rather than supply issues.

The details and methodologies of each of these existing pieces of research are detailed in section 1.2: Existing research: methodologies.

As well as synthesising existing research, this report also includes the findings of new qualitative research conducted on specific topics of significance. Each of these topics looks at a different approach to demand management:

- water metering (economic instruments)
- selecting a new washing machine (water-efficient technologies)
- watering the garden (non-regulatory policy: education and outreach).

The selected topics are priority areas, where the potential impact on household water demand is relatively high and there was a need for new consumer research. The rationale for focusing on each of these topics is set out below, and the methodology is covered in section 1.3: New research: methodology.

## Water metering

Water metering and volumetric charging is a common demand management approach to incentivise households to conserve water. In non-metered areas that have been surveyed, there is generally strong public opposition to, or misconceptions about, household water metering. The objective of this research was to help to understand public opinion in greater depth. This understanding will be valuable for any authorities wishing to consider metering as a demand management option in the future.

## Selecting a new washing machine

The purpose of this research was to provide a greater understanding of the channels of influence relating to appliance purchasing decisions, to help in targeting the promotion of water-efficient technologies such as washing machines.

Rather than looking at appliances generally, this research focused specifically on washing machines for the following reasons:

- washing machines are the second-largest indoor use of water following showers, typically accounting for 27 per cent of indoor water use (Heinrich, 2008)<sup>2</sup>
- washing machines are among the more common, and more regularly purchased, water-using household appliances, with most households having one.

## Watering the garden

While outdoor water use varies between households, it can account for about 18 per cent of all household water use during summer. ‘Outdoor use’ includes uses such as irrigation, car washing, topping up swimming pools, and cleaning; however, garden irrigation is the main outdoor use (Heinrich, 2008).

Garden watering can have a significant effect on water demand at peak times. A key objective of the qualitative research was to gain an understanding of garden watering behaviour,

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<sup>2</sup> Note that this BRANZ study looked at household water use in 51 single-dwelling properties in Auckland. Therefore the results are indicative only.



particularly about attitudes around wasteful watering and how decisions are made about how frequently to water, which can be used to inform communications and interventions, particularly for local government.

## 1.2. Existing research: methodologies

The following existing research is synthesised in this report:

- the Ministry for the Environment's *Household Sustainability Survey 2008* (Johnson et al, 2008)
- Watercare Services' *Project Oracle: Water Usage and Conservation Across the Auckland Region* (TNS Conversa, unpublished)
- Greater Wellington Regional Council's *Researching Public Opinion on Water Supply for Greater Wellington* (UMR Research, unpublished).

The methodologies for each of these surveys are detailed below.

### Household Sustainability Survey 2008

The Household Sustainability Survey 2008 was conducted for the Ministry for the Environment by Research New Zealand in September 2008. It involved a quantitative telephone survey of 1000 respondents, representative of the New Zealand population. Topics within the survey included: using water efficiently; organic waste reduction; managing electrical waste; energy efficiency; transportation; building and renovating sustainably; and taking sustainability into account for purchasing decisions. The survey design was based on the Survey of Public Attitudes and Behaviours Toward the Environment 2007, by the United Kingdom's Department for Environment, Food and Rural Affairs (Defra).

The Household Sustainability Survey 2008 provided a 'snapshot' of New Zealanders' attitudes and behaviours with regard to being environmentally sustainable. It also updated the results of the Ministry for the Environment's Household Sustainability Benchmark Survey, which was completed in November 2007.

While it covered a range of subjects, only the water-related attitudes and behaviours, and the population segmentation, are covered in this synthesis.

### Project Oracle: Water Usage and Conservation Across the Auckland Region

Project Oracle: Water Usage and Conservation Across the Auckland Region was a qualitative and quantitative survey on water in the Auckland metropolitan area (Auckland, North Shore, Waitakere, and Manukau cities, and Papakura district)<sup>3</sup>. It was conducted by TNS Conversa for Watercare Services. The study was undertaken to review attitudes to water conservation and usage, to guide the development of strategies to fund and/or delay significant future infrastructural investment.

It had several respondent groups: households, small and medium enterprises (SMEs), and major water users. For households, a quantitative survey of 1251 Auckland households was conducted

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<sup>3</sup> References to 'Auckland' throughout this report will refer specifically to the area covered by Watercare's research: Auckland, North Shore, Waitakere, and Manukau cities, and Papakura district.

in September–October 2007, and the qualitative research involved six focus groups held in November 2007.

The research with major water users and SMEs is outside of the scope of this synthesis.

## **Researching Public Opinion on Water Supply for Greater Wellington**

Greater Wellington Regional Council's Researching Public Opinion on Water Supply for Greater Wellington was conducted by UMR Research and completed in December 2007. It involved a qualitative and quantitative study of Greater Wellington residents.

Fourteen mini-groups were used for the qualitative research, with 71 participants in total. To explore the views of a wide range of demographics, specifications were set for the mini-groups, which included demographic and geographic categories.

The findings of the qualitative research informed the design of the quantitative survey, which involved a telephone survey of 500 respondents. Quotas were set for respondents in Porirua (100), Upper Hutt (100), Hutt city (130), and Wellington (170).

Topics of the research included perceptions about availability and the value of water, attitudes and behaviours in relation to conserving water, and water management options. Attitudes, perceptions and behaviours relating to household water use, including the population segmentation, are covered in this synthesis; supply augmentation issues are outside of the scope.

### **1.3. New research: methodology**

This report also includes the findings of new qualitative research conducted on three specific topics of significance (water metering, selecting a new washing machine, and watering the garden).

This qualitative research involved five focus groups which were undertaken between 4 and 11 May 2009 in Auckland and Wellington. The research was conducted by Judy Oakden Consultancy for the Ministry for the Environment.

Each of the five groups focused primarily on one of the three topic areas, although water metering was also discussed briefly in the groups on the other topics. Selecting a new washing machine and watering the garden were covered first, in groups in both Auckland and Wellington, with the final half hour of each of these meetings spent discussing water metering. Finally, a group focusing exclusively on water metering was undertaken in Wellington (*see* table 1).

This approach provided some insight into the differences in water metering perspectives of those from Auckland (where all households are metered for water use) and those from Wellington (where most households are not metered).

All focus group participants were on town water supply. Participants for the ‘new washing machine’ and ‘garden watering’ groups were identified as being in the ‘Waste Watchers’ population segment<sup>4</sup> (the key target audience for these interventions), while participants for the ‘water metering’ group represented the broader general public. Participants were selected for the relevant focus groups on the basis of having recently purchased a washing machine<sup>5</sup>, or being someone who regularly waters their garden<sup>6</sup>. Loose quotas were set to ensure there was a mix of ages, gender and ethnic groups included in the study. The focus group composition is shown in table 1.

**Table 1: Focus group composition (new qualitative research)**

Topic	Wellington groups	Auckland groups
Selecting a new washing machine (Water metering was discussed for the final half hour)	<ul style="list-style-type: none"> <li>• Washing machine purchasers</li> <li>• ‘Waste Watchers’</li> <li>• Mix of gender, ethnicity and age</li> </ul>	<ul style="list-style-type: none"> <li>• Washing machine purchasers</li> <li>• ‘Waste Watchers’</li> <li>• Mix of gender, ethnicity and age</li> </ul>
Watering the garden (Water metering was discussed for the final half hour)	<ul style="list-style-type: none"> <li>• Garden waterers</li> <li>• ‘Waste Watchers’</li> <li>• Mix of gender, ethnicity and age</li> </ul>	<ul style="list-style-type: none"> <li>• Garden waterers</li> <li>• ‘Waste Watchers’</li> <li>• Mix of gender, ethnicity and age</li> </ul>
Water metering	<ul style="list-style-type: none"> <li>• People without water meters</li> <li>• General public</li> <li>• Mix of gender ethnicity and age</li> </ul>	

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<sup>4</sup> Participants were selected as Waste Watchers based on the population segment identified in the Household Sustainability Survey 2008. For recruitment into these focus groups, Waste Watchers were identified as being at least somewhat “concerned about environmental issues”, disagreeing that “it’s only worth doing things to help the environment if others do the same” and agreeing that “I do a few things in my everyday actions to help the environment. I just hate wasting things. I would like to do a bit more”.

<sup>5</sup> Participants in the ‘washing machine’ focus group were respondents who had taken part in the decision-making about and purchase of a washing machine within the last two years.

<sup>6</sup> Participants in the ‘watering the garden’ focus group were respondents who had personally watered a garden at least once every two weeks during the last summer (between December 2008 and March 2009).

## 2. Attitudes to water

While New Zealanders do understand the vital importance of water and its necessity for life, they often do not stop to think about where their household water comes from, and can take it for granted. In general, very few people perceive that there are any probable or serious risks to the water supply, and as such, making conscious efforts to conserve water is not a priority for most unless a crisis situation is reached.

Arising from this belief that water is plentiful, in Wellington there was wariness of the motives for introducing household water metering, with tension between it being seen as a way to generate revenue versus responsible forward planning. Many see the idea of being metered and charged for water as a loss of something that is free and is a ‘human right’.

While consciously conserving water is not a priority for many New Zealanders, a significant proportion do have strong anti-waste attitudes, and overt waste of water is frowned upon.

### 2.1. Valuing water

Water is often taken for granted in New Zealand households. The research by Greater Wellington and Watercare found that for many New Zealanders, water is simply not a ‘top of mind’ issue and there is an expectation that water should and always will flow from their taps. This can mainly be attributed to a low appreciation that water resources are finite.

Many people do not stop to think about where their water comes from. They do, however, understand the vital importance of water and its necessity for life. Watercare’s research found a high level of agreement with the statement “water is a valuable resource”. But most see water as a ‘God-given right’, and are not engaged in the issue of conservation. The overall attitude to water can be summarised by the comment “Without it we die ... it is just that essential; [however], there appears to be plenty of it.”

### 2.2. The relative importance of water

The research by both Greater Wellington and Watercare asked respondents about the importance of water relative to other utilities. Greater Wellington found that water was more highly regarded than other utilities such as gas, electricity, or telecommunications “which are important but do not prompt a life threatening situation if they are withheld”.

Notably, in Auckland, where residents are charged for their water use, water was considered slightly less important than electricity – implying that water is treated more like a commodity than a public good, where there is a financial transaction involved. However, Aucklanders still considered water to be more important than communications, waste removal, recycling services, and gas. Responses indicated that electricity was ranked as more important than water in Auckland as it was almost literally perceived as the ‘power’ behind everything else, “without it everything else comes to a standstill including the water pumps and water treatment plants”. Aucklanders considered water-related issues to be less evident than electricity, because they are less talked about in the media, and because there is a less regular connection with the utility, compared to monthly electricity bills and occasional power cuts. Similar findings came out of the new qualitative research, with saving energy being considered more important than saving water for washing machine purchasers.

## 2.3. Perceived availability and risks to supply

Almost all New Zealanders agreed with statements like “water is a limited resource and we shouldn’t waste it”,<sup>7</sup> but conversely, when asked directly about risks to supply very few perceived there to be any risks.

“Don’t know” was the most common response when Watercare asked respondents “do you think there will be enough water to meet the demands of Auckland’s water needs in the next 20 years?”.

Greater Wellington’s research found that there is perceived to be a very low risk to the water supply in Wellington. This stems from a belief that there is plenty of water in the region, and a general disinterest and complacency where water supply is concerned. For most Wellingtonians, risk to supply and the need to conserve are hypothetical issues.

The Greater Wellington report points out that although there is an assumption that there will be sufficient water to meet needs, there is a recognition from the public that:

- water is a limited resource
- it is a shared, community resource
- the Wellington region is growing and with it a need for more water
- there is always a need to plan for the future.

## 2.4. Perceptions of water use, conservation and wastage

A strong dislike of overt waste emerged as a common theme through each piece of research, which is reflected in each of the population segmentations (*see* section 3: Population segmentations). This dislike of overt waste does not always equate to conscious efforts to conserve, although most respondents said they pay attention to the amount of water they use at least sometimes.

Two-thirds (69 per cent) of respondents to the Ministry for the Environment’s Household Sustainability Survey 2008 claimed to give thought to the amount of water they use at home, and 75 per cent of Watercare’s respondents said they consider their water use at least occasionally. Those who thought about their water use were also more likely to say that they engaged in specific water-saving activities such as having short showers, or using water efficient technologies.

Greater Wellington’s research found a strong theoretical support for water conservation, but also that take-up of these actions is likely to be much lower unless a crisis situation is reached. Forty-nine percent of Greater Wellington’s respondents claimed to be making an effort to conserve water, and only 14 per cent claimed to make very little effort. Ninety-two percent claimed they would do more to conserve water if there was a shortage, and 77 per cent felt that the community could do more to save water.

But some Greater Wellington residents had a reluctance to conserve water when they were not sure who it would benefit. They did not mind making savings to benefit ‘everyday’ people, but not the council (who may have been partly responsible for the shortage) or ‘greedy neighbours’ with sprinklers and swimming pools.

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<sup>7</sup> Fifty-eight per cent strongly agreed and 28 per cent agreed when asked in the Ministry for the Environment’s Household Sustainability Survey 2008.

Overall, Greater Wellington residents were very aware of wastage and could cite numerous examples of where this has occurred. The main ways water is wasted were considered to be:

- household use including leaving taps running, long showers, and washing cars with hoses
- leaky taps and pipes (households, businesses and council)
- gardens, including sprinklers and watering lawns.

So while most survey respondents were very conscious of overt waste, and many claimed that they at least occasionally thought about their water use, significantly fewer were making any sustained and considered efforts to conserve. Most admitted that they could do more, but without the threat of an imminent crisis, or any perceived personal benefit, they lacked the motivation to do so. This lack of motivation would need to be addressed in order to increase the uptake of water-saving behaviours.

## **2.5. Attitudes to household water metering**

The focus of the qualitative research on household water metering was to understand attitudes, particularly fears and objections, to metering in an area that is not currently metered. The approach used also provided some insight into the differences in attitudes to water metering between areas that are currently metered (Auckland) and those that are not (Wellington).

### **Understanding the role of councils**

Although there was some confusion about different councils' roles where more than one organisation was involved in water supply to an area, focus group participants in Wellington had expectations that 'the council' would lead the way in demonstrating water conservation practices. This included the use of water-saving techniques on its own properties, fixing leaks quickly, and fairly apportioning the cost between domestic and business use of water.

There was a low recognition of the infrastructure costs in supplying water to Wellington, and a tension between the introduction of water metering being seen as revenue generating, versus responsible forward planning. Residents relied on councils to make sound decisions on their behalf, but many were not interested in the detail of those decisions.

### **Perceptions of water availability**

In both Auckland and Wellington, participants thought that there was generally plenty of water available. In Wellington, this translated into a feeling that household water metering would not be needed, and therefore wariness about the motives for considering its introduction. But in Auckland it appeared that water metering had become normalised and accepted, partly because it was universal there.

### **Conserving water**

While there was commitment to not being wasteful in Auckland and Wellington, there was little spontaneous focus on conserving water to reduce water bills in Auckland (other than reducing the use of hot water to reduce power bills), or to conserving water for environmental reasons.

Group participants frequently articulated an ability to adapt and use less water (for example when in rural areas, at holiday homes or on overseas travel). But participants enjoyed returning to urban life, where water is more plentiful and where they could have long showers, for instance. Water use seemed to be viewed as a form of 'personal freedom'.

## Attitudes, fears, and objections

Household water metering brought out both rational and emotive responses from focus group participants, and often the two were intertwined.

There was some acknowledgement that some people might be better off with household water metering in Wellington; for instance, those who used little water. But there was a general feeling that there would be more people paying more and only a few paying less if household water metering were introduced. Participants assumed metered water would be an extra cost to them, without a corresponding reduction in rates.

Wellington focus group participants were more critical of the need for water metering than were their Auckland counterparts and were generally opposed to its introduction. It seemed that group participants did not really want to engage in water planning discussions, rather they wanted water to be 'on tap' as cost-effectively as possible. Part of this reserve to be involved related to a lack of knowledge and expertise to make informed decisions about the future, and a lack of knowledge about the need for water conservation. Participants commented:

I haven't heard anything about it and I don't think I would go to the trouble of trying to find out about the infrastructure because I think that it will probably ... annoy me even more.

If it [information about water infrastructure] is not obviously available to us, who is going to spend their time Googling that?

Group participants in Wellington were asked for the potential advantages of water metering. In general, groups continually returned to the disadvantages of water metering. The main advantages of water metering were perceived to be that users pay for the water used, leaks will become more apparent, households will become more aware of the water used, and that some may save in water bills from their more frugal use.

Amongst those without household water meters, the idea of water being measured and charged for created a sense of 'loss' of a New Zealand 'way of life' – where water is free and unrestricted use is mostly possible (except for when there are seasonal water shortages). Water was considered 'free' and there were concerns over who should have the 'right' to 'sell' water.

Discussion about household water metering in Wellington raised issues of equity – there was a sense that water is a 'human right' and needs to be available to all. Some felt access should be unrestricted, whilst others felt it was only fair that people pay for the water they used. Aucklanders perceived the advantage of household water metering was that everyone paid for the water they used.

For group participants in Wellington there appeared to be both a sense of stealth and a sense of inevitability around activities related to water metering, and this was fuelled by wariness about the motives for introducing it.

There was also a sense of inevitability that household water metering would lead to the privatisation of water, and the electricity reform model was cited as a likely model for water privatisation. Some participants were in favour of privatisation as it was seen as offering more choice, whilst others were strongly opposed to privatisation.

Wellington group participants observed that in addition to usage costs, there are two types of costs which would be incurred if water metering were implemented; the cost of the initial installation, and the cost of ongoing maintenance. So residents felt they would pay for all aspects of implementation along the chain and expected that the average cost of water to each household would increase as a result.

The full report on the qualitative research on water metering is included in appendix 1: Attitudes to household water metering.

## 3. Population segmentations

Segmenting the population is an effective way of identifying target audiences based on their attitudes, behaviours, or other characteristics. Each of the three large-scale surveys developed population segmentations to identify and better understand target audiences for communications and policy interventions.

Two significant types of segments emerged from these segmentations: ‘environmentally minded’ segments; and ‘thrifty’ segments. The environmentally minded segments tend to have the highest levels of awareness and concern about water and other environmental issues, and express willingness to do more; but their current actions often fall short of their convictions. Thrifty segments are people with a strong element of conservation-mindedness and an aversion to waste in any form, which is not necessarily linked to environmental concerns, but is highly relevant to people’s beliefs about water use.

One particular thrifty segment, ‘Waste Watchers’ from the Ministry for the Environment’s Household Sustainability Survey 2008, was selected as the target audience for the new qualitative research on washing machine purchasing decisions and garden watering covered in sections 4.2 and 4.3. Waste Watchers were chosen on the basis that they are the largest population segment (from the Ministry for the Environment’s research), and they have greater scope for change. Information on the Waste Watchers segment can be found in section 3.3: Thrifty segments.

### 3.1. Overview of the segmentations

The approach used to segment the population differed in each survey. Therefore, the resulting segments and the distribution of the population through these segments also differ, but similarities can be found.

The Ministry for the Environment’s survey respondents were segmented along purely attitudinal lines. This was based on the approach used by the United Kingdom’s Department for Environment, Food and Rural Affairs’ (Defra) Survey of Public Attitudes and Behaviours Toward the Environment 2007, the survey on which the Household Sustainability Survey 2008 was based. The segmentation was based on attitudes towards a range of environmental issues, not just water. This produced seven population segments, which are detailed in table 2.

**Table 2: Population segments (Ministry for the Environment)**

Segment name	Proportion of population (%)
Positive Greens	14
Waste Watchers	39
Concerned Consumers	18
Sideline Supporters	5
Cautious Participants	8
Stalled Starters	5
Honestly Disengaged	11



Watercare’s Auckland research identified three segments based on attitudes towards water use and conservation, which are detailed in table 3. The Greater Wellington qualitative research also identified three attitudinal and behavioural segments, which were then quantified through the quantitative research and are detailed in table 4.

**Table 3: Population segments (Watercare)**

Segment name	Proportion of population (%)
Pale Green	52
Traditionalists	36
Do-nothings	12

**Table 4: Population segments (Greater Wellington)**

Segment name	Proportion of population (%)
Conservation Minded	27
Pragmatic	47
Ambivalent	26

While each of the three segmentations works on a continuum from the most environmentally minded to the least, the different approaches used means that these continuums do not necessarily correlate to each other. This is because each approach is based on a different mix of attitudes and behaviours to both water and other environmental issues. For example, an individual might be classified as within Watercare’s most environmentally minded segment, Pale Green, which makes up 52 per cent of the population. But using the Ministry for the Environment’s segmentation, which has a greater number of smaller segments, the same individual might fit into Positive Greens, Waste Watchers, Concerned Consumers, or one of the other segments. However, general themes do emerge from comparisons between these segmentations.

## 3.2. Environmentally minded segments

The most environmentally minded segments were the Ministry for the Environment’s ‘Positive Greens’, Watercare’s ‘Pale Green’, and Greater Wellington’s ‘Conservation Minded’ segments. While the relative size of each of these segments differed significantly, most likely due to the different approaches to the segmentations, there were commonalities between these three most environmentally minded segments.

The Ministry for the Environment’s Positive Greens made up 14 per cent of the population, and 70 per cent of them were female. They had higher income and education levels than the population average, but were less likely than average to be home owners. They were moderately more likely than the population average to live in urban areas. Positive Greens have the highest levels of awareness and concern about environmental issues, including climate change, but given this, they were doing less than they could. The Positive Greens were significantly more likely to be willing to take action, but for various reasons their actions fell short of their intentions and beliefs.

Watercare’s Pale Greens represented 52 per cent of the population, and were demographically very similar to the population average, although gender information is not available. They were Watercare’s segment most likely to think about water and other environmental issues, and had a high consideration of their water use around the home. The Pale Greens were more likely to see

themselves as low users of water, and were the most likely to say they were willing to conserve water. They were motivated more by a sense of responsibility and a desire to protect the planet, rather than any special knowledge of water issues in Auckland. Although this was Watercare's segment that was most responsive to the issue of water conservation, and Pale Greens are more likely to accept responsibility, they still wanted to enjoy water and consider using water to be part of their lifestyle. Like the Positive Greens, the Pale Greens' level of action did not fully match their convictions, with some even admitting that they were only undertaking token actions.

Greater Wellington's Conservation Minded segment made up 27 per cent of the population. They were, of all Greater Wellington's segments, making the most effort, and displayed conservation traits across a variety of issues, not just water. They were the most receptive segment to conservation messages, but have limited potential for change as they claim to be already doing a lot. As with the other surveys, Greater Wellington's findings included a general point that the discussion of ways to save water was generally some way ahead of actual take-up and consistent application of those behaviours.

### **3.3. Thrifty segments**

Each of the three segmentations involves a segment (Waste Watchers, Pragmatic, and Traditionalists) that had a strong element of conservation-mindedness and waste avoidance, which was not necessarily linked to environmental concerns, but rather a natural thriftiness and frugality. In each case this was the second most environmentally minded population segment, and in each of the three segmentations, this frugal group made up a similar and significant proportion of the population.

Greater Wellington's Pragmatic segment was described as being "averse to wastage and [they] make savings in other aspects of their lives". One of Watercare's Traditionalists summed up the tendency to be conservation minded, saying "that's just the way I was brought up – I was raised by a generation who felt waste in any form is bad"; the Ministry for the Environment's Waste Watchers have similar attitudes.

The remainder of this section focuses specifically on what is known about the Ministry for the Environment's Waste Watchers segment, as they are the key target audience for the new qualitative research on purchasing a washing machine and watering the garden covered in sections 4.2 and 4.3.

#### **Waste Watchers**

Waste Watchers were the largest population segment in the Household Sustainability Survey 2008, and in general they represented the social norms and values of New Zealand as a whole. Waste Watchers as a group were slightly older than the population on average (55 per cent were aged 40 years or older), and females were slightly over-represented in the segment (59 per cent). The majority of Waste Watchers were home owners with gardens, and they were earning roughly average incomes.

Waste Watchers are the segment most strongly opposed to waste: both in terms of creating rubbish, and wasting resources such as water and energy. Of the Ministry for the Environment's seven segments, Waste Watchers were the most likely to disagree with the statements "I don't pay much attention to the amount of water I use at home" (94 per cent), and "I don't really give much thought to saving energy in my home" (96 per cent).

In relation to their attitudes to the environment, Waste Watchers had the second highest levels (after Positive Greens) of disagreement with the following attitudinal statements:

- The effects of climate change are too far in the future to really worry me. (98 per cent)
- It's not worth me doing things to help the environment if others don't do the same. (96 per cent)
- It's only worth doing environmentally friendly things if they save you money. (96 per cent)
- It's not worth New Zealand trying to combat climate change because other countries will cancel out what we do. (85 per cent)

Waste Watchers also had higher than average willingness to engage in the water-saving behaviours that they didn't already do.

There were notable differences in the relative size of the Waste Watchers segment in New Zealand, compared to the United Kingdom equivalent identified in Defra's survey. In New Zealand, Waste Watchers made up 39 per cent of the population, whereas in the United Kingdom Waste Watchers accounted for only 12 per cent. It appears that this aversion to waste is particularly strong in New Zealand.

Waste Watchers are the target audience for the new qualitative research on washing machine purchasing decisions and garden watering covered in sections 4.2 and 4.3. This is because they were the largest population segment in the Household Sustainability Survey 2008, and they have a distinctive anti-waste mindset, which has strong similarities with the Pragmatic and Traditionalists segments (from Greater Wellington's and Watercare's research respectively). Any information or interventions targeted at Waste Watchers would be expected to also reach the more environmentally minded segments such as Positive Greens, without directly targeting them, due to their strong pro-environmental attitudes.

## 4. Behaviours

In general, New Zealanders were more likely to say they currently conserve water through habitual behaviours rather than having carried out one-off actions. But when asked about their willingness to do more to save water, many were less willing to take up new habits, compared with making one-off changes.

Most survey respondents said they were maintaining habitual behaviours such as having short showers instead of baths, turning off the tap when brushing teeth, or doing only full loads of washing. Fixing leaks was the most common one-off action in both the Watercare and Greater Wellington research, but was not included in the Ministry for the Environment's survey.

This section summarises the findings about behaviour from each of the three existing pieces of research; these are followed by summaries of the findings on two behaviours in particular (selecting a new washing machine, and watering the garden) that were considered in the new qualitative research. The full reports on these qualitative research topics are included in appendices 2 and 3.

### 4.1. Behavioural questions in the existing research

Each of the quantitative surveys asked respondents about their current water-saving behaviours, and their willingness to or likelihood that they may take up certain behaviours in the future.

There were significant differences in the way the three surveys were structured; these are likely to account for the notable differences in results between surveys. The Ministry for the Environment and Watercare quantitative surveys directly asked respondents whether or not they were engaging in particular water-saving behaviours. Greater Wellington's quantitative survey asked respondents about current water-saving behaviours on an unprompted basis.

The water-saving behaviours covered in each of the surveys can be classified as either habitual behaviours or one-off actions. Turning off taps when not in use is an example of a habitual action, whereas choosing a water-efficient shower head is a one-off action.

The habitual behaviours covered fit into the following categories:

- tap use
- baths and showers
- toilet flushing
- using washing machines and dishwashers
- car washing
- re-using water
- watering gardens.

The one-off actions fit into the following categories:

- garden watering equipment
- fixing leaks
- appliance or hardware purchasing
- toilet cistern capacity
- rainwater tanks.

## The Ministry for the Environment's findings

Most Household Sustainability Survey 2008 respondents said they paid attention to the amount of water they used at home. The majority also reported that they did only full loads of washing, and were choosing water-efficient washing machines and toilets when purchasing. Fewer said they had replaced their shower head with a more water-efficient one or reduced the volume of their toilet cistern.

The full set of water-use behaviours covered in the Household Sustainability Survey 2008 is detailed in table 5.

**Table 5: Current water-use behaviours (Ministry for the Environment)**

Category	Behaviour/action	Currently doing or already have (%)
Habitual: baths and showers	Have one shower a day that is 3–5 minutes long	73
Habitual: using washing machines and dishwashers	Only do full loads of washing	82
One-off: appliance or hardware purchasing	When buying a new washing machine, choose one that is water efficient	80
	When buying a new toilet, choose one that is water efficient	67
	Replace your shower head with one that is more water efficient	45
One-off: toilet cistern capacity	Reduce the volume of your toilet tank (by putting in a solid object)	31
One-off: rainwater tanks	Install a rainwater tank for outside use	24

When these behaviours were looked at in relation to demographic or lifestyle factors, there were few significant differences. The only notable differences in the uptake of these behaviours are listed here.

- Respondents who were not on town supply water were more likely to have installed a rainwater tank for outside use, at 60 per cent, compared with only 24 per cent of the general population.
- Of the respondents who lived in a home owned by their parents, only 51 per cent were taking shorter showers, compared with 73 per cent of the general population.
- Renters were less likely to have bought a water-efficient toilet, at only 50 per cent.

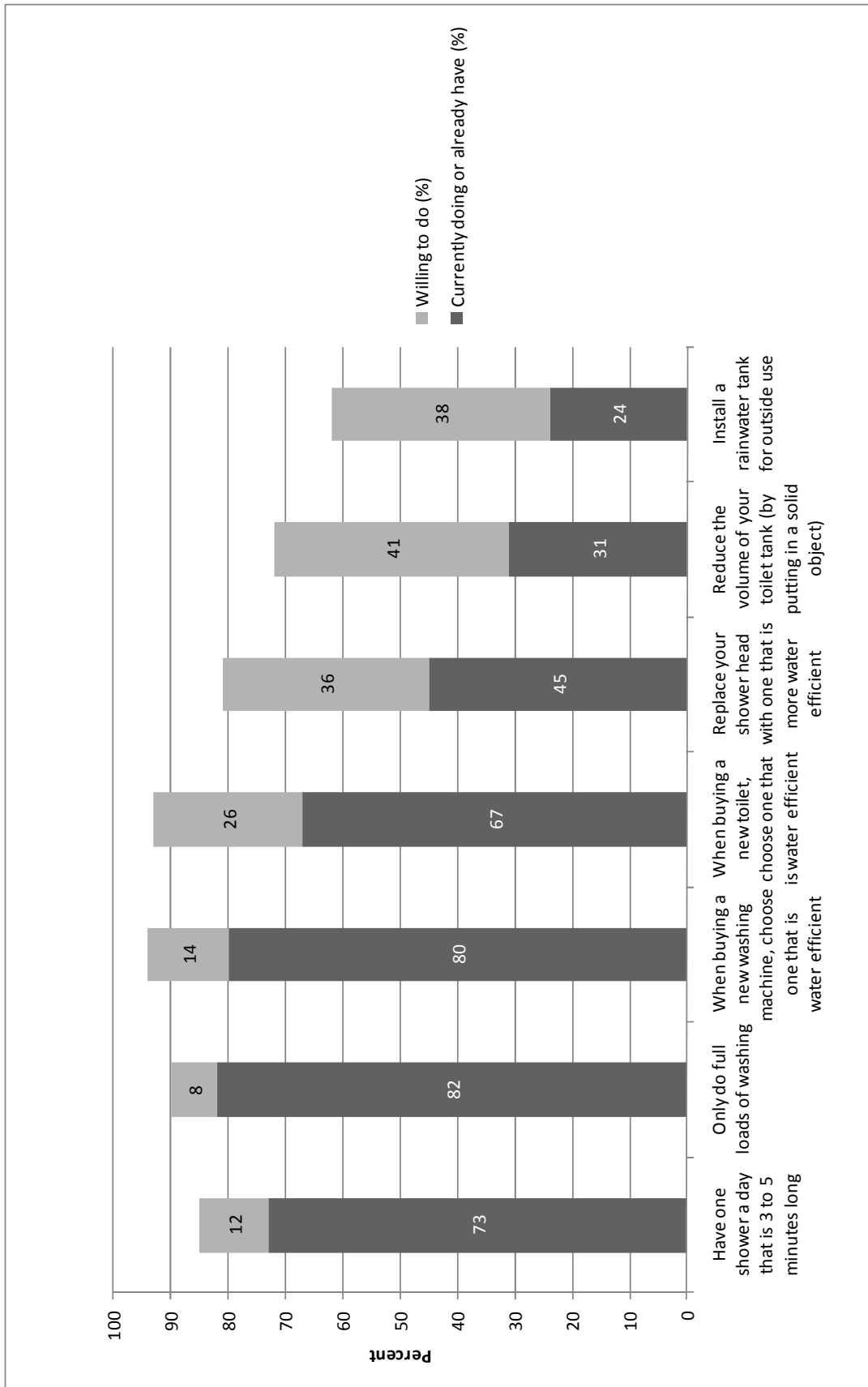
Those respondents who said they didn't already have the appliances or were not currently engaging in the water-use behaviours, were then asked if they were willing to do these things. Most respondents who did not currently have water-efficient washing machines, toilets or shower heads, said they would be willing to choose a more efficient one in future. Respondents were more likely to say they were willing to take one-off actions than to change their habits. Table 6 shows the willingness to take action in the future for the sub-sample of respondents who said they hadn't already taken these actions.

**Table 6: Willingness to engage in new water-use behaviours (Ministry for the Environment)**

Category	Behaviour/action	Willing to do (%)
Habitual: baths and showers	Have one shower a day that is 3–5 minutes long	46
Habitual: using washing machines and dishwashers	Only do full loads of washing	44
One-off: appliance or hardware purchasing	When buying a new washing machine, choose one that is water efficient	72
	When buying a new toilet, choose one that is water efficient	78
	Replace your shower head with one that is more water efficient	66
One-off: toilet cistern capacity	Reduce the volume of your toilet tank (by putting in a solid object)	59
One-off: rainwater tanks	Install a rainwater tank for outside use	50

Figure 1 (on the following page) gives a summary view of the combined percentages of those who were currently undertaking these water-use behaviours or were willing to undertake them.

Figure 1: Water-use behaviours – current and willing to do (Ministry for the Environment)



## Watercare's findings

Almost 70 per cent of households in Watercare's survey undertook at least one high-water-use activity as part of their regular lifestyle, with more than half washing their cars regularly, and half gardening regularly. The high-use activities also included waterblasting and boat washing.

The most common habitual water-saving behaviours were: having showers instead of baths, keeping showers short, turning off the tap when brushing teeth, and only doing full loads in the washing machine or dishwasher. Of the one-off actions, 60 per cent of respondents said they fix leaks, but less than half said they had things like water-efficient appliances or garden equipment.

Rather than just looking at current behaviours, Watercare's research used five key metrics to compare water-saving behaviours. For each behaviour or action, respondents were asked if they were aware of it as way to save water. For the behaviours and actions they were already aware of, they were then asked the following questions.

- Impact: "Which do you think significantly impacts water usage (ie, reduces the amount of water we use)?"
- Current use: "Which of these do you currently do/use in your household?"
- Future use: "Which of these do you think you may consider doing/using in the future?"
- Ability: "Which of these do you think your household has the ability to use/adapt to?"

Table 7 gives the full results for each behaviour, and figures 2 and 3 graph these, showing habitual behaviours and one-off actions separately. Note that the questions about impact, current use, future use, and ability were only asked of the sub-samples of people who were already aware of the behaviour/action as a way to save water, but the percentages recorded are out of the total sample.



**Table 7: Behaviours and actions – awareness, impact, current, future, and ability (Watercare)**

Category	Behaviour/action	Awareness (%)	Impact (%)	Current use (%)	Future use (%)	Ability (%)
Habitual: tap use	Turning off the tap when brushing your teeth	85	54	66	44	65
Habitual: baths and showers	Taking a shower instead of a bath	94	75	87	47	70
	Keeping showers to 6–8 minutes or less	75	58	51	39	55
Habitual: using washing machines and dishwashers	Only doing full loads when using a washing machine or dishwasher	73	51	55	38	52
Habitual: car washing	Washing cars with a bucket instead of the hosepipe	80	57	44	40	56
Habitual: re-using water	Using recycled water purified to drinking water standards	35	18	4	15	15
	Re-using water (eg, collecting waste water for watering the garden etc)	64	41	17	31	37
Habitual: watering gardens	Watering gardens less	74	49	43	34	45
One-off: garden watering equipment	Planting gardens that require little watering (ie, not “thirsty plants”)	45	26	18	22	27
	Using water-efficient irrigation systems in the garden	49	32	10	20	23
One-off: fixing leaks	Fixing leaks	89	75	60	47	60
One-off: appliance or hardware purchasing	Appliances with water-efficiency ratings (eg, front-loading washing machines)	63	40	25	33	37
	Low flow/water-efficient shower heads	59	40	23	30	36
One-off: toilet cistern capacity	Dual-flush toilets (or placing a brick in toilet cisterns)	69	51	47	36	47
One-off: rainwater tanks	Using a rainwater tank	67	52	9	32	33

**Figure 2: Habitual behaviours – awareness, impact, current, future, and ability (Watercare)**

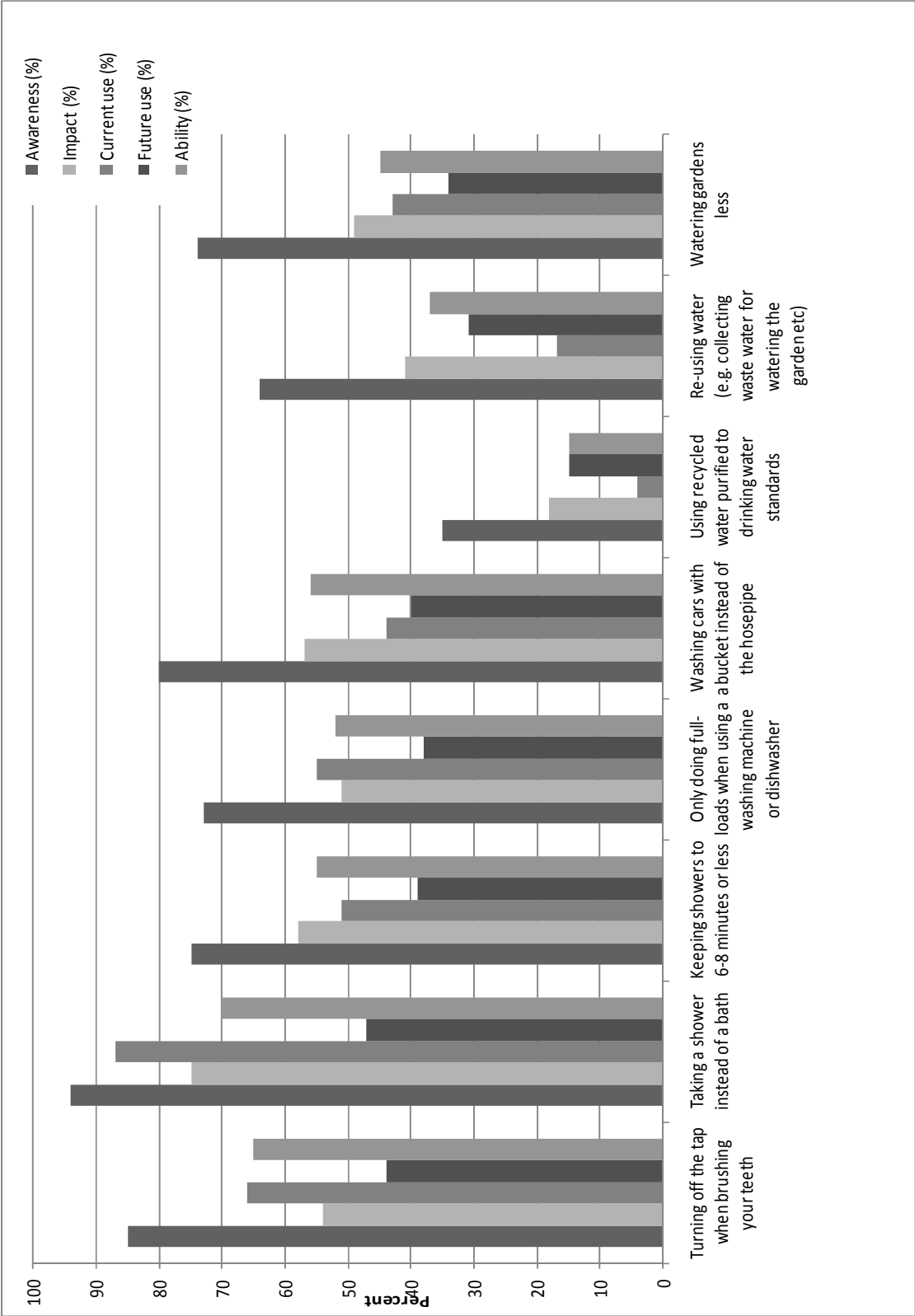
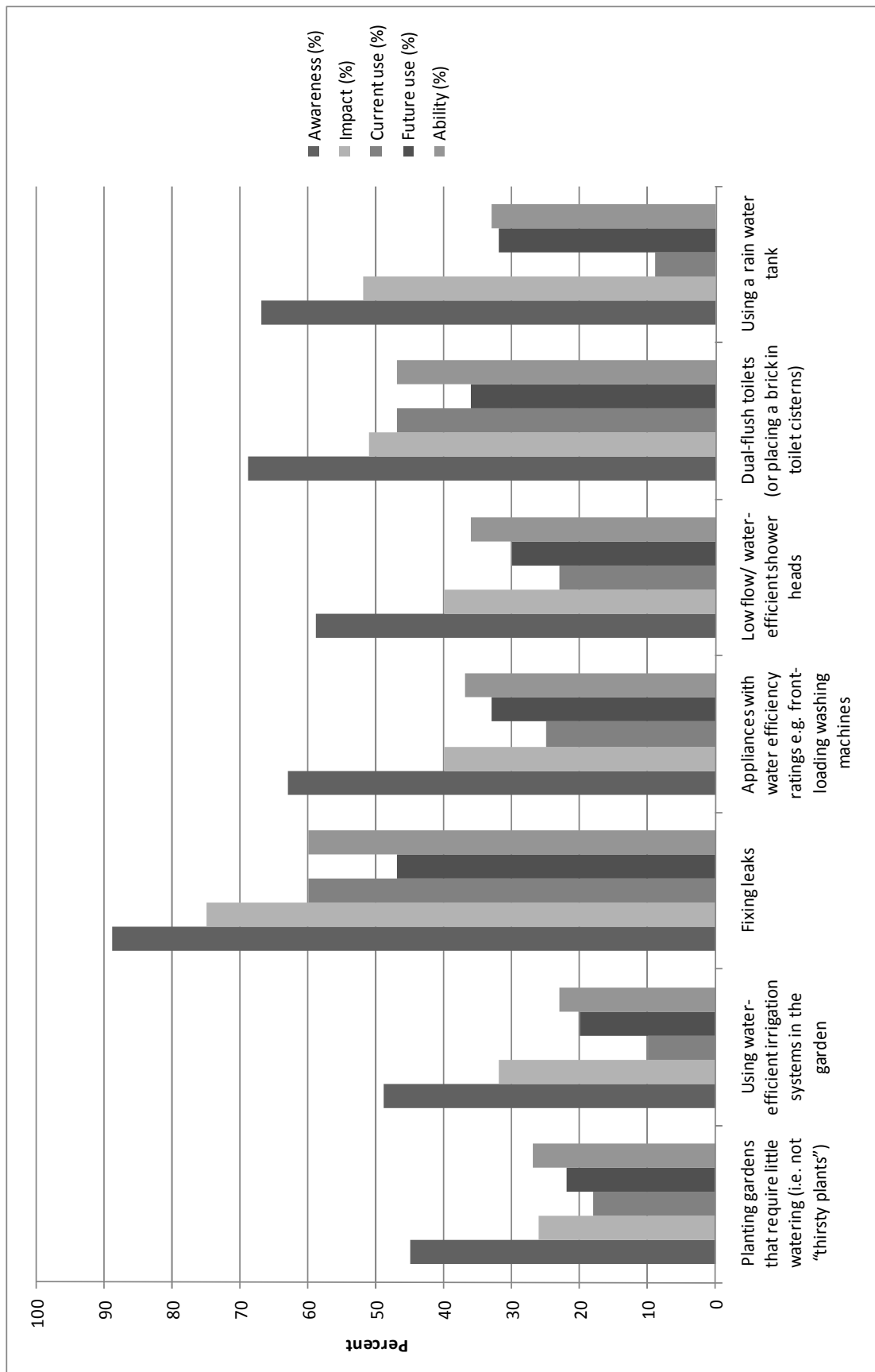


Figure 3: One-off actions – awareness, impact, current, future, and ability (Watercare)



Watercare’s research also investigated consumers’ willingness to pay a premium for the following water-efficient technologies:

- Water-efficient irrigation
- dual-flush toilets
- water-efficient shower heads
- front-loading washing machines.

The total willing to pay a premium for water-efficient versions of these devices ranged from 36 per cent of respondents willing to pay more for water-efficient irrigation, to 52 per cent willing to pay for front-loading washing machines or water-efficient shower heads. Of those respondents who were willing to pay a premium, most were willing to pay only 10 per cent more.

## **Greater Wellington’s findings**

Greater Wellington’s respondents, when asked what they were currently doing to conserve water, were most likely to say they had habitual behaviours involving tap use, bathing and showering, and watering gardens. Greater Wellington’s findings were similar to Watercare’s, with the most popular behaviours being turning off the tap when not in use and having a bath instead of a shower. Fixing leaks was the most common one-off action. Respondents were not prompted on the actions, but were asked an open question. The full set of responses is contained in table 8 on the following page.

The Greater Wellington survey then asked respondents, on a scale of 1 to 5, how willing they would be to take specific steps to conserve water. Most were willing to fix leaks, but fewer respondents were willing to take the other steps they were questioned about. Table 9 gives the total willingness for each action (ie, the percentage who responded with a 1 or 2, on a scale where 1 is “very willing” and 5 is “not at all willing”).

**Table 8: Current steps to conserve water (Greater Wellington)**

Category	Behaviour/action	Currently doing (unprompted) (%)
Habitual: tap use	Turn off tap when not in use	36.1
	Turn off tap when brushing teeth	13.1
	Conserve water in the kitchen – tap off when not using	1.4
Habitual: baths and showers	Have showers not baths	27.0
	Have short showers	20.2
	Share bath water	0.7
	Don't fill bath	0.3
Habitual: toilet flushing	Use the half-flush on my toilet (if have a dual-flush toilet)	7.5
Habitual: using washing machines and dishwashers	Only use when load is full	5.3
	Don't use a dishwasher / hand wash with little water	1.7
	Use economy cycle	1.0
	Reduce use of washing machine	0.3
Habitual: car washing	Don't wash car regularly	4.9
	Go to a car wash	0.3
	Use a bucket	0.3
Habitual: re-using water	Recycle water from washing machine to garden	6.8
Habitual: watering gardens	Water the garden/plants by hand	18.7
	Don't water the garden/lawn/vegetables	3.4
	Time sprinklers to an hour or less	2.9
	Use mulch	2.5
	Water in the evening	0.6
	Use very little to water	0.5
	Have plants that don't require much watering	0.4
	Collect rain/pool water for garden	0.2
One-off: garden watering equipment	Water with low-flow equipment (eg, soak hoses)	3.1
	Have water trigger on hose	1.6
One-off: fixing leaks	Fix leaky taps and pipes quickly	16.9
One-off: appliance or hardware purchasing	Have front-loader washing machine	11.8
	Replace old shower head with an efficient one	3.3
One-off: toilet cistern capacity	Device in single flush toilet reduces flush by a litre	1.0
One-off: rainwater tanks	Use a rainwater collection tank	5.1

**Table 9: Willingness to take steps to conserve water (Greater Wellington)**

Category	Behaviour/action	Willing to do (%)
Habitual: Tap use	Turn off the tap when brushing teeth	38
Habitual: Baths and showers	Have showers that are less than 5 minutes	32
	Have showers not baths	27
Habitual: Toilet flushing	Use the half-flush on my toilet (if have a dual-flush toilet)	42
Habitual: Re-using water	Recycle water from my washing machine for the garden	41
One-off: Fixing leaks	Fix leaky taps and pipes as soon as they occur	54
One-off: Appliance or hardware purchasing	Replace older shower heads with a water-efficient shower head	42
	Purchase a low-water-use (typically front-loader) washing machine when the current one needs replacing	39
One-off: Toilet cistern capacity	Put a device in my single-flush toilet cistern to reduce flush by one litre	48
One-off: Rainwater tanks	Use a rainwater collection tank	44

## 4.2. Selecting a new washing machine

The focus of the qualitative research on selecting a new washing machine was to understand where Waste Watchers get their information from, and what influences their appliance-purchasing decisions, to provide a greater understanding of the channels of influence.

There was a wide range of information sought about washing machines prior to their purchase. Key aspects were obtaining a good price and/or deal, followed by reliability and/or durability and/or brand reputation. The physical size of the machine was important, especially in smaller homes. The capacity and configuration of the machine (top-loading or front-loading) were also considered. Features such as the different washing cycle options were also important, as were warranty, and delivery and installation options.

Washing machine purchasers were not aware of the significant contribution to the total household water consumption of washing machines. Instead they were more concerned with power use. Focus group participants commented that they tried to keep their power bills down, so a machine which did not consume a lot of power was attractive. There was also an interest in washing machines that did not use a lot of water, to minimise the use of hot water and hence minimise power costs.

In both Wellington and Auckland there was also, to a lesser extent, a desire not to waste water. The energy-efficiency and water-efficiency labels were key communication devices to communicate cost efficiency to Waste Watchers buying washing machines. The frugal nature of Waste Watchers appeared to be the major driver in obtaining these efficiencies, rather than a desire to be environmentally responsible.

Table 10 summarises the different types of information sought at different stages during the purchase process. For some washing machine purchasers, typically making unplanned purchases, this process was undertaken in a matter of hours or just a day or two. For other, more planned purchases, the decision-making process was conducted over a longer period of time and for some, took up to two months.

**Table 10: Information sought at various decision stages for washing machine purchases**

Decision stage	Activities
Stage 1: Initial thoughts	<ul style="list-style-type: none"> <li>• Determine the options – new machine or repair old one.</li> <li>• Past experience, history and preconceptions of brands.</li> <li>• Retail store window-shopping.</li> <li>• Identify possible constraints (price, brand reputation etc).</li> <li>• Reflect on particular likes/dislikes and requirements (eg, size of space for the machine).</li> <li>• Consider individual preferences.</li> </ul>
Stage 2: Begin investigation	<ul style="list-style-type: none"> <li>• Discussions with repairman.</li> <li>• Retail store visit (look at all the models available).</li> <li>• Possibly discuss with salesperson (but many salespeople considered ill-informed about product).</li> <li>• Discussion with friends and family – word of mouth.</li> <li>• Internet searches to find out what the options are: manufacturers' websites, retailers' websites, Consumer, TradeMe and internet forums to compare different brands and establish what is available.</li> </ul>
Stage 3: Weighing up the options	<ul style="list-style-type: none"> <li>• Arrive at some options.</li> <li>• Determine which machines are available in the price range.</li> <li>• Assess aspects such as reliability, cycle features, warranties.</li> <li>• Assess what the ongoing costs might be – parts, power, and to a lesser extent water use.</li> <li>• Flyers (important source of information): price, machine features, power and water efficiency – all in a snapshot.</li> </ul>
Stage 4: Final purchase – getting a 'deal'	<ul style="list-style-type: none"> <li>• Aim to get the best deal price-wise – negotiate with salesperson.</li> <li>• Also consider how much the ongoing costs will be: power, water, are parts available for repair?</li> <li>• What is available now?</li> <li>• Delivery and/or installation – an issue for some, but not others.</li> </ul>

As table 10 identifies, there was a wide range of fragmented sources of information used in the decision process for purchasing a washing machine. Participants commented that retail sales staff were typically of little use in the decision-making process. This was because they often lacked detailed product knowledge (eg, just reading the one sentence description on the store price/information display).

Many washing machine purchasers were relatively time poor, and the purchase of a washing machine was complex with a wide range of factors considered. The first 'tier' of factors considered by Waste Watchers was cost, reliability and some aspects of functionality. Energy efficiency and water efficiency appeared in the second 'tier' of considerations.

Simple communication was powerful, and the water-efficiency and energy-efficiency rating stickers had impact. Most recent washing machine purchasers in the groups were already aware of the labels and had seen them. The water-efficiency labelling provided a benchmark of sorts, and enabled comparison between different washing machines. In addition, there was very little confusion between water-efficiency and energy-efficiency labelling. Energy-efficiency and water-efficiency labelling were clearly understood and factored into the purchase decision.

Waste Watchers purchasing washing machines appeared to lack an understanding of the contribution of washing machine use to overall household water usage. In addition, the number and nature of the factors considered in their purchase of washing machines is already very crowded.

The full report on the qualitative research on selecting a new washing machine is included in appendix 2: Selecting a new washing machine.

## 4.3. Watering the garden

The focus of the qualitative research on watering the garden was to gain an understanding of garden-watering behaviour, particularly about attitudes around wasteful watering and how decisions are made about how frequently to water, which can then be used to inform communications and interventions, particularly for local government.

There was a range of awareness of how to water gardens effectively among the Waste Watchers in focus groups in Auckland and Wellington. Some were very knowledgeable, others less so. Watering approaches used varied according to the type of garden, time of year, and time available for gardening. While some gardeners had established routines in the garden, many were opportunistic in making time to attend to the garden. Some of the water-conserving methods of watering the garden also promote healthy gardens, or are consistent with effective garden care. Although Waste Watchers were concerned about being wasteful, they were generally not aware of the contribution of garden watering to total household water use.

### Effective watering practice

Some Waste Watchers claimed to have routines related to watering their gardens in terms of regularity, consistency of approach, time and frequency of watering (which were at times mitigated by circumstances). While Waste Watchers were knowledgeable about effective ways to water, there was little evidence that this knowledge was always put into practice. Effective watering appeared to be highly subjective, with respondents believing their practice was not as wasteful as that of others.

Many Waste Watchers knew that thorough and less frequent watering (once every three days to once a week, for an hour or two) was more effective than light and frequent watering (every second day for half an hour). Few used timers for irrigation systems, instead they turned the irrigation system, sprinkler or soaker hose on by hand or used a hand-held hose or watering can to water their gardens. Sprinkler owners tended to turn sprinklers on manually rather than use timers. This sometimes resulted in waste if they forgot to turn them off.

Sprinklers were highly visible, and the time, frequency and spread of water from sprinklers was seen as either effective or wasteful, depending on how they were used. Waste Watchers were concerned to avoid overwatering, and saw water runoff or water-logging as undesirable. They were particularly scathing of neighbours who used their sprinklers all the time, regardless of the weather.

Hand-held hoses were used by many to water the garden. Benefits were that the hose watered specific areas, and that in many instances participants had to be actively engaged in watering the garden when using the hose. Watering cans were also seen as a particularly effective way to deliver water exactly where needed.

Some Waste Watchers only watered the garden if there had not been rain for several days. Some of those with watering routines watched the weather forecast and watered in the early morning or evening, if they thought it was not going to rain. Others were opportunistic in the timing of watering their gardens, and gave them a good soak when they remembered. For many who were time poor, gardens were watered when time was available, and this was not always at the optimal time for the garden.

There was evidence that some gardeners had adapted their gardens to make them easier to manage – for instance using mulch, improving the soil over a number of years, or adapting the planting style.

While commentary in news media reminded Waste Watchers not to water too often, in their minds this related more to water shortages during droughts, than water conservation in general. On the other hand there were also a few participants who were aware of the need to



conserve water, but overall Waste Watchers felt concerned not to ‘waste’ water (rather than conserve it). Waste was defined as watering the garden when the garden is clearly damp or there are even pools of water, or overwatering – where there was water running onto the footpaths from the garden. It was considered wasteful to use high-powered sprinklers rather than a concentrated soak of the garden, as was watering when the sun was high.

## **Indicators that the garden needs watering**

Indicators that a garden needed watering included both rational observable aspects and less tangible, more emotive aspects.

The rational indicators that the garden needed watering included:

- Assessing the soil condition to determine if the garden needed watering. Some checked below the surface.
- Plants were droopy, losing leaves, looked lethargic, or if there were lots of insects on plants.
- Dry weather for an extended period.
- New plantings that needed more intensive tending.

The emotive drivers for watering the garden included:

- For some it was a relaxing ‘time out’ activity.
- Others used garden watering as a chance to spend time with children, and gardening was an important skill some parents wanted to share with their children.
- Some felt guilty if they did not maintain the garden to the parent’s instruction. They felt particularly guilty if plants seemed ‘stressed’ – especially if their parents were visiting.
- In some suburbs there was social pressure from neighbours and from others to maintain a healthy looking garden. They were likely to water their garden to ensure it looked similar to others in the street.
- For some, their garden was linked to their self esteem (how they felt about themselves) and their self identity (how others viewed them).
- There was also a sense amongst group participants that gardening is an iconic New Zealand activity, especially the pride of growing fruit and vegetables, and allowing children to play in the garden with the hose.

The full report on the qualitative research on watering the garden is included in appendix 3: Watering the garden.

## 5. Barriers and incentives to action

As outlined in section 2: Attitudes to water, for the majority of New Zealanders water conservation is not a top of mind issue. They often do not stop to think about where their water comes from, and can take it for granted. So while some, particularly those in the Waste Watchers, Pragmatic, and Traditionalists segments, have strong anti-waste attitudes and don't like overt waste, few are consciously water conservative.

Other barriers to water conservation included questions over whose responsibility it was, and lifestyle factors. And while environmental concerns were an incentive for some, for many, saving water was more often a by-product of saving money or energy.

### 5.1. Barriers

Some of the main reasons people were not doing more to conserve water were:

- not perceiving a need to conserve
- having little or no feedback on their water use
- lifestyle factors including cost, time and effort
- questions of whose responsibility it is.

A perceived lack of need or concern for water conservation came through strongly in Greater Wellington's research. It was the most commonly voiced barrier in its qualitative research. The research concluded that "in the short term at least, only a real crisis or water shortage will result in a significant increase in water conservation efforts".

This theme also emerged in the new qualitative research. When discussing household water metering, participants were unsure of what the motives would be for introducing metering, because water was perceived to be plentiful. This belief is likely to be a barrier preventing many people from doing more to conserve water.

Once it was established that there may be a need to be more frugal in the future, some Greater Wellington qualitative research participants still questioned who their water-saving efforts would benefit. They did not mind making savings to benefit 'everyday' people, but not the council (who may have been partly responsible for the shortage) or 'greedy neighbours' with sprinklers and swimming pools.

Similarly, Watercare's quantitative research found that there was a relatively high level of agreement with the statement "businesses are the high water users – so water conservation is their responsibility". However, the qualitative research found that if consumers could be convinced that water is potentially in short supply, they were prepared to share equal responsibility with businesses.

Lifestyle factors were also a common barrier, with many participants in Watercare's qualitative research defending their right to use water in ways that pleased them. Similarly, it was observed in the new qualitative research that water use appears to be very personal to New Zealanders, and messages asking them to modify their water use behaviours are often seen as an intrusion into their personal lives.

### 5.2. Incentives

As outlined above, a particular barrier to greater engagement with water conservation is a lack of perceived need to conserve. So, while environmental concerns are important for some, for most, saving money or saving energy are the key motivators.

It is worth noting that while many people have environmental motivations, they don't link these to water use as they don't see or understand the environmental benefits of water conservation, beyond a generalised belief that conservation is good.

Greater Wellington's qualitative research found that for many, water conservation is a by-product of energy or other savings. Examples of these unintentional water savings included:

- actively using less hot water to save energy
- buying new appliances, which were often more efficient
- using mulch on gardens for weed control, but as a result having to water less often
- recycling washing machine water on the garden to kill insects.

In Auckland, where water is metered and households are charged for their usage, Watercare's research found that saving money in general was the top incentive for saving water. This was followed by saving on electricity costs specifically, helping the environment and others, having more water for the future, and taking pressure off treatment plants.

The Ministry for the Environment's research found a relationship between attitudes towards water resources, and willingness to use water efficiently. Those who agreed that "water is a limited resource and we shouldn't waste it" were found to be more willing to do only full loads of washing, replace their shower heads with more efficient versions, install rainwater tanks, and reduce the volume of their toilet tanks, compared with those who disagreed with the statement.

## **6. Applying the research to demand management**

The assembled research gives an overview of New Zealanders' attitudes, behaviours, and perceptions of household water use. The introduction of any demand management interventions is likely to impact on households. An understanding of the householders' perspective is crucial to successfully communicating with the public.

### **6.1. Communicating with the public**

Encouraging New Zealanders to voluntarily adopt new water conservation behaviours, except in times of crisis, is complicated. While most New Zealanders regularly carry out some water-saving behaviours, they generally do so out of habit rather than making a conscious effort. They also have an extremely low belief in the need to conserve water, based on their belief that water in New Zealand is plentiful. The following key principles for communicating with the public about water conservation emerged from the research.

#### **Don't assume understanding of the need to conserve water**

The importance of water is well understood, but New Zealanders expect that water will always come out of the tap. It appears that if it rains all the time there must be plenty of water.

So while most admit that they could do more to conserve water in a shortage or crisis, few perceive there to be any likely risks to supply. This means that communications should not assume that people – even those in 'environmentally minded' or 'thrifty' segments – will understand or believe in the need to save water. Communications will need in some way to either address or work around this lack of belief.

#### **The environment is not a key motivator**

While there are large segments of the New Zealand population who are environmentally minded, the environment is not a major motivator for water conservation at present. Appeals to environmental values when asking people to change their water-use habits are unlikely to succeed on their own. While environmental protection is a motivator for some, it is often outweighed by barriers such as lifestyle factors. Savings are generally a stronger motivator.

#### **Appeals to frugality are likely to be more successful**

New Zealanders in general, and particularly the sizable 'Waste Watchers' segment of the population, just don't like waste in any form. This conservation-mindedness is borne out of culture and upbringing, and is not necessarily linked to environmental concerns. Appeals to New Zealanders' frugal nature are likely to be more successful at motivating water conservation than appealing to environmental concerns.

#### **Saving money is important**

Related to New Zealanders' waste aversion, the research found that saving money is an important motivator. Savings on energy bills are one of the key motivators for reducing hot

water use. Even in Auckland, where household water is metered, the focus was often more on reducing electricity rather than water costs, because electricity use was considered more obvious than water use. There is an opportunity for communications to tap into, or respond to this desire to save on energy costs.

## **Making one-off actions is easier than changing habits**

Unconscious habitual behaviours are difficult to change even with the best intentions, and changes can be difficult to maintain. On the other hand, one-off actions like buying a new washing machine require conscious thought and environmental or conservation considerations are more likely to be taken into account. Communications should take this into account when selecting behaviours to focus on.

## **Water-use behaviours can be very personal**

New Zealanders see water use as something very personal and part of their way of life. So while they avoid overt wastage, they are reluctant to change their behaviours. Any appeals to changing their behaviours could be seen as an intrusion into their personal life. Communications need to take account of and acknowledge, directly or indirectly, the highly personal nature of New Zealanders' relationship with water.

## **Show people what wastefulness looks like**

Most of the cited examples of wasteful water use involved sprinklers left on at all hours, 'golf-green' lawns, swimming pools, and obvious leaks. But most people don't have a clear idea of what 'normal' water use looks like, or any sense of where they use the most water in their homes. So while overt waste is frowned upon, they could be completely unaware of subtler waste. Most people believe that they are not wasteful with their water use – *other* people are. There is an opportunity for communications to demonstrate what normal water use is and/or what water wastage looks like, to increase the likelihood that people will associate their actions with the messages.

## **Don't blame residents for water problems**

Water issues and wasteful water use are areas that the public has limited knowledge about. It is also clear that there is, for some people, a strong sense that public bodies have a great deal of responsibility for water use and water wastage. It is unlikely that people will respond to messages about wasteful water usage if they feel they are being blamed.

## **Use trusted messengers**

The qualitative research suggests that some messengers may be more effective than others at delivering water conservation messages. The highly personal nature of New Zealanders' relationship with water, combined with wariness of motives for considering household water metering, suggest that trusted personalities (such as respected local gardeners) may be more effective messengers in some instances. Councils may need to consider their communications carefully when encouraging water-saving behaviours. A well-respected source, closer to home, might be more influential in changing behaviours.

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# Appendix 1: Attitudes to household water metering

*The following is the full report from the new qualitative research on household water metering. This research was conducted by Judy Oakden Consultancy for the Ministry for the Environment in May 2009.*

The focus of this qualitative research on household water metering was to understand attitudes, particularly fears and objections, to metering in an area that is not currently metered.

The approach used also provided some insight into the different attitudes to water metering between areas that are currently metered (Auckland) and those that are not (Wellington). One focus group in Wellington (where water is not currently metered) exclusively covered the topic of water metering, and the other four focus groups held in Auckland and Wellington (on selecting a new washing machine, and watering the garden) spent the final half-hour discussing water metering.<sup>8</sup>

There were some common themes which emerged from these focus groups.

- Household water metering brought out both rational and emotive responses from group participants.
- Amongst those without household water meters, the idea of water being measured and charged for created a sense of ‘loss’ of a New Zealand ‘way of life’ – where water is free and unrestricted use is mostly possible (except for when there are seasonal water shortages).
- Group participants frequently articulated an ability to adapt and use less water (for example when in rural areas, at holiday homes, or on overseas travel). But participants enjoyed returning to urban life, where water is more plentiful and where they could have long showers, for instance. Water use seemed to be viewed as a form of ‘personal freedom’.
- There was a tension between the introduction of water metering being seen as a way to generate revenue, versus responsible forward planning. Residents relied on councils to make sound decisions on their behalf, but many were not interested in the detail of those decisions.
- There was a sense of inevitability that household water metering would lead to the privatisation of water, and the electricity reform model was cited as a likely model for water privatisation. Some participants were in favour of privatisation as it was seen as offering more choice, whilst others were strongly opposed to privatisation.
- There was a sense that if water metering was introduced most households would pay more, and only a few would pay less for their water.
- Discussion about household water metering raised issues of equity – there was a sense that water was a ‘human right’ and needs to be available to all. Some felt access should be unrestricted, whilst others felt it was only fair that people pay for the water they used.
- There was very little sense that group participants either in Auckland or Wellington were able to gauge how much water they used or what activities had the greatest contribution to their overall water usage.
- While there was commitment to not being wasteful, there was little spontaneous focus on conserving water to reduce water bills (other than reducing the use of hot water to reduce power bills), or to conserving water for environmental reasons.

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<sup>8</sup> Note that the participants in the focus groups on ‘selecting a new washing machine’ and ‘watering the garden’ were identified as being in the ‘Waste Watchers’ population segment.

## Attitudes to water metering in Auckland (metered)

Amongst the ‘Waste Watchers’ in the Auckland focus groups, there was general acceptance of household water metering. Those who had not lived in other New Zealand cities were surprised that household water metering was not universally implemented throughout the country. On a practical level those who already had household water metering viewed it as ‘normal’. Those who moved to Auckland from other regions recalled being initially surprised to find water was metered, but accepted it as there was no choice.

### There is generally plenty of water

Auckland Waste Watchers had the confidence that other than when there were water restrictions, they could use water as they liked. They perceive that there is usually plenty of water available for use, the choice is theirs, they just have to pay for it. There was an understanding that some of the water comes from reservoirs around Auckland and also from the Waikato River, but there was a sense that other than in a drought, the water supply was plentiful and secure.

### No real sense of how much water used

Auckland Waste Watchers were typically unable to ‘gauge’ how much water they got for their money, nor did they seem to understand which water use activities contributed most to their bill.

You get a water bill from [the water utility]. On it will detail how many cubic metres you have had in, which takes a mind-boggling consultation to figure out. And I used to understand water, but they now use cubic metres, and its 3 feet by 3 feet by 3 feet of water. If you can visualise that? And how many of those did you load into your house this week. And then at the bottom they say you have had 10 cubic metres of water or 100 cubic metres of water and 80 cubic metres of it went down the toilet pipe.

### User pays – generally fair

Auckland Waste Watchers perceived the advantage of household water metering was that everyone paid for the water they used. This meant those who were overly wasteful were penalised and those who were frugal were not. There was acknowledgement that household water metering might result in high bills for large lower income families, who may be least able to afford them, but Auckland Waste Watchers thought the system was fair overall.

I think a water meter is quite fair, I can’t see any other way of doing it because it is very unfair just having all joined on to a pipe and having all pay \$10 a week for your water, if your neighbour next door washes three cars and all this sort of drama and you are sitting there scrimping away saving water out of your washing machine and pouring it on your garden and generally saving water and he’s devil-may-care.

### No choice over household water metering

Within the groups, it appeared that water metering had become normalised and accepted, partly because there was no other choice.

No choice and whether ...part of that no choice has got to do with the fact that they have reined in something that is falling from the sky. And if we all had tanks like we used to, then would we need Metrowater at all?



## **Cost of water is increasing**

Auckland Waste Watchers were conscious that water costs money. There was a perception that over the years the cost of water, which had been 'free', had gone up considerably and there was nothing residents could do about it, as the following quote illustrates.

The [water] rates go up and it goes up all of a sudden but you haven't got any [say], you are not told that it's now going up again and why it is going up or anything like that.

## **Rentals – fair apportionment sometimes difficult**

Quarterly bills were more of an issue for tenants than home owners, as sometimes flatmates moved out without paying their portion. The current payment arrangements did not coincide with people's movements in the way a monthly bill would, as the bill came so infrequently. Also, some flatmates used a lot more water than others. Another issue was the apportioning of water costs in apartment blocks.

It is my understanding though that [billing] is a problem in some multi-dwelling complexes; I have a daughter who had a difficulty with water billing and [had an] ongoing row with the landlord over who was responsible for [it].

## **Main issue is leaks and repairs**

For Auckland Waste Watchers, the main issue with household water metering was dealing with the council over leaks or repairs. While obvious leaks and dripping taps were attended to promptly, residents often only identified less obvious leaks by a higher than usual water bill and by watching the water meter when water was not being used in the house.

And as I found out the hard way, I had a horrendous water bill come along. And I thought 'what the hell is going on there?' So I turned everything off and went to bed. At night when there was nobody up and nobody was moving or using any water, and nobody went to the toilet in the middle of the night. And I got up and there's so many gallons of water gone in the morning on the meter. Oh, and it was right underneath my concrete driveway, and I had to have the drive ripped up to sort it out.

## **Waste removal is 'double billing'**

Another issue for Auckland Waste Watchers was the perceived 'double billing' of water, firstly billing residents for water as it came onto the property by meter, and then billing (by ratio of 'water in' to 'water out') for taking wastewater from the property. While it is perceived as providing greater transparency in the water billing by some, others feel powerless to affect the waste portion of the bill.

The annoying part about it is that you might pay \$800–1000 for as much water as you want and you think that's a fair price for the 10,000 litres of water that I have used. But they also charge you for the 8000 litres that went down the dunny pipe, they charge you for that as well. So what comes in they charge you once for and what goes down the dunny pipe they charge you [for] again.

## **Does household water metering drive water conservation?**

While Auckland Waste Watchers were aware that water use incurs a charge, they thought the cost did not seem high enough to drive sustained, considered behaviour change. Waste Watchers did not like to be wasteful and that predisposition to frugality appeared to be the key motivator for water conservation behaviour, rather than a high level of concern regarding the cost of household water metering. However, it was observed in the Wellington focus group that Aucklanders appeared to be more conscious of their water use.

I have a lot of friends in Auckland ... I will go up there leave the tap running, you know turn around to do something, and they are turning it off, and I am like “shit, sorry”.

While household water meters do not seem to overtly drive water conservation behaviours, participants in the Auckland focus group on watering the garden were more typically mentioning using grey water or having rainwater tanks for garden watering than the Wellington focus group.

I realised ...that I had been watering in the garden in previous years [and] if I was going to start using that hose it was going to affect our watering bill ...so I started to [use grey water] not very easily, but try and just sometimes if I happened to be at the washing machine at the right time, because I couldn't time my washing machine either to say give me the grey water now, but I would take grey water from there ....I know from years ago that [you can take] a little bit of soapy water ...and chuck it over your veges, it helps keep the bugs off.

However, the use of grey water was also considered a hassle by some.

Hassle....We collect it in buckets as the machine empties and carry it out into a larger container and tip it in and store it and use it. And that means for me taking a bucket over a carpeted area in the house to get out the door to get to where I have got to go to.

## **We are not wasteful, it's others**

Auckland Waste Watchers' judgment of overt water waste was not focused on their own water use, but that of their neighbours. They described wastefulness as daily, prolonged use, often during the day (rather than in the evening) of sprinklers; leaking taps; or water overflowing from the hot water cylinder on to the roof. They reported they attended to obvious leaks promptly to avoid incurring larger than necessary water bills.

You look around the neighbourhood and there is often a person with that pipe that goes up to the roof that are the equalising pipe, and it is the hot water and you can see it when the sun is out and you can see where it has drained down the roof and it's all shiny and then you look at the roof and oh that's been happening for a while.

## **Attitudes to water metering in Wellington (non-metered)**

Three focus groups in Wellington were conducted to better understand concerns over household water metering amongst those who currently do not have water meters; one of the groups covered this topic exclusively. Generally participants knew some of their water came from the Te Marua storage lakes, but there was no clear understanding of their role, or of the integrated water system serving the Wellington metropolitan area. They saw the Wellington water supply being plentiful and abundant, quite different from Kapiti, where there were acknowledged water shortages.

Wellingtonians had very little knowledge of the amount of water they used and the types of activities that used the most water. There was vague awareness that water rates were between \$500 and \$1000 per annum, but this sum tended to get lost within the general rates.

Discussions about household water metering were both rational and emotive, and often the two were intertwined. There were a lot of different concerns regarding the introduction of household water metering, which are outlined below.

## **No need, plenty of water**

On a rational level, there was a sense that household water metering was not needed in Wellington: “we don’t need it – there is not a water problem”. Most group participants felt that, as there is plenty of rain in Wellington, there is plenty of water.

I mean there has been shortages in the summers where you can’t wash your cars, windows or water your garden, but I still think like everyone said there is a lot of rain here, so I think we all do probably take it for granted that we can wash the car or water the garden or bath the kids or have an hour-long shower if that’s what you wish to do.

I think you are right we probably are a little bit ignorant to someone saying right for three days you can’t shower, we have never been that extreme in New Zealand.

Well [they are] sort of regional problems aren’t they, different regions have different problems.

I don’t think we have got a water problem myself, I think there is plenty of water supply in Wellington. It’s obviously because you have got the mountains and hills and water coming off and the rivers. If we need more water for the growth it’s not that fast that we can’t build another reservoir... I think that putting water meters in ... it’s a revenue collection exercise so they can pay for building more infrastructure .... I don’t think we will ever run out of water and definitely not in Wellington, not like in places like Australia where they need to get sea water and desalination plants.

## **Water is ‘free’**

On a more emotional level, water was seen as something that was ‘free’ and there were concerns over who should have the ‘right’ to ‘sell’ water.

I think most people would be really gutted thinking they are going to have to pay for something that we have had free for all these years.

It’s sad that we have to come to the fact that we have got to pay for water when it should be free.

But whose is it to sell, it comes from the sky?

With water meters I was thinking about how fortunate we are that we don’t have to have water meters, and how in some countries it has led to privatisation and some people not being able to afford water.

## **Low recognition of water infrastructure costs**

On the other hand there was acknowledgement from a very few participants that there is an infrastructure cost in supplying water.

It’s very expensive supplying water, I mean the council pay a lot of money doing the water reticulation, dams, filtering, purifying, it doesn’t come for nothing I can assure you of that.

But they [the council] are not getting it for nothing, we are already paying.

Those who had lived in Auckland were aware of how the infrastructure charges worked, and those who visited friends in Auckland also noted they had different behaviours related to water use.

In Auckland... they’ve got two separate charges, you’ve got your wastewater, there is a charge for wastewater as well as the water usage.

I have a lot of friends in Auckland ... I will go up there leave the tap running, you know turn around to do something, and they are turning it off, and I am like “shit, sorry”.

## Water is a human right

Further exploring the notion that water is 'free', it becomes apparent that water is seen as a human right. The notion that people might have their water cut off if they do not pay their bills is unacceptable.

So there is a whole lot of other issues surrounding who has got the right to access clean water.

It's an interesting thing that I am thinking of is that water is a basic human need. And it becomes an ethical issue as well. Because you can't go turning someone's water off because they either can't afford the bill or they haven't paid the bill, because it is necessary for life. And so it becomes an ethical question, about how you are going to enforce [water metering].

In addition, because water use is seen as a human right, there is a feeling that household water metering may not curb usage, as the following quote suggests.

I guess we are all in the unknown, but same with power, I am sure none of us sit in the darkness because we are scared that that's going to cost too much money...I think either you are really going to care about it or you are not. If it is \$500 a month I guess you think "oh shivers", but again it is going to affect half of us, some people won't care some people will still leave the hose running, wash the cars do whatever ... I don't care. I will have half-an-hour in the shower, I don't care if my meter is going to go, if I am cold I will turn a heater on, I don't think about the power bill. So again you have got the greenies and you have got the people who don't care... I do think we all take it for granted, that we turn it on and it's there.

## Concerns about privatisation

Underpinning concerns over who should have the 'right' to sell water was the belief that, longer term, once metering was introduced, water utilities might be sold off. There was potential for water utilities to operate in a similar manner to electricity utilities. Some group participants were disenchanted with electricity utilities and thought they were taking unnecessarily large profits. Privatisation was seen as the inevitable final outcome of household water metering.

I think it will start off like everything else has started off, with being the one supplier and then in order to raise capital they will sell [it] off.

It will be exactly the same as the power companies. The government is saying we are going to introduce competition so we are going to have all these different power companies. So we have all these power companies and we have all these CEs that are paid so much money and we will have these great big staff organisations. And they are all going to have to make a profit so they can pay dividend back to the government. And so it will be exactly the same with the water, there will be a new company set up, they will introduce these meters, they will cost a fortune. They are going to have a whole big staff to run it, there is going to be another big organisation to go out and maintain them, to install them. And who's going to pay for it?

Also they build up this company it is going to take a lot of money to build up the infrastructure for the company. And what happens if they sell it off, do they sell that in the future? Just also I think it is education as well, I don't think people are really [clear] what's the council's intention, so ... has [council] got some sort of hidden agenda in this?

## Water metering – a revenue generating mechanism

Closely aligned to privatisation was a concern that household water metering would be viewed as a potential revenue source. There was a sense that water was a public good, something that should be produced at cost, not profited on.

It's like, oh, we should start another electricity company so we can pay someone else a million dollars and to have another big branding exercise and the PR firm is going to make more money ... but it doesn't create competition. And I think that water is a commodity that shouldn't be subject to competition, how many countries would you have that, have two water suppliers, you can't.

And so they will get an injection of capital for doing that. And then it will open up the market. And I think competition is great but they generally don't give us a lot of benefits. Because they all sort of seem to gauge themselves off each other.

## **Cost increase, not redistribution of costs**

In general, the focus was on additional costs as opposed to the identification of any environmental benefits that might be derived from water metering. Group participants observed there are two types of costs that would be incurred if water metering were implemented: the cost of the initial installation, and the cost of ongoing maintenance. Then there are usage costs. So they felt they would pay for all aspects of implementation along the chain and expected that the average cost of water to each household would increase as a result.

There is going to be cost to install them that's going to be huge, it will go on our rates to pay for that.

Further, participants believed that with additional costs of implementation and maintenance their rates bill was unlikely to reduce even if there was a separate water bill. Thus they believed there would not be a redistribution of costs and that costs for metering would be additional to the existing rates bill.

I think it would be rare that we would get a discount off our rates bill because we will be getting charged for the metering. I think that it will just be an extra cost and an extra revenue stream.

## **More losers than winners**

There was some acknowledgement that some people might be better off with household water metering, for instance, those who used little water. But there was a general feeling that there would be more people paying more and only a few paying less if household water metering was introduced. This added to the perception that household water metering is a profit-making venture.

In the end I doubt whether you are actually going to be better off if you are conservative in your water usage with a meter because it's another revenue stream I think.

To me it is also certainty of price like you get most things are going to go up each year whatever the rate is, it won't go down.

I think user pays systems always benefit a small group. The benefits being shared across the community or society is less likely to make it in the hands of the common person.

## **Lack of understanding about current usage**

Group participants noted they did not know how much water they used per year, so it was hard to estimate what the benefits or disadvantages of household water metering might be.

I think we don't know anything like that, whatever water usage we are currently using per household, we don't know what the general portion that we are paying of it is, say it is 20 per cent of our rates. What is that, what is that equivalent to? Is that how many litres of water is allocated per house before we go over the threshold, and we would be considered using too much water?

We don't know how much we are paying for.

## Lack of trust in motives

Underlying all these concerns was a lack of trust in the motives for metering household water. This was evident when one of the focus groups on selecting a washing machine was moved on to discuss household water metering. Respondents made the following comments.

So this is what it [the focus group] is all about, the water metering.

The other one [washing machine topic] was just to suck you in, it's that sales pitch.

Two hours talking about washing machines and it wasn't really about that at all was it?  
The bloody council.

## Councils need to lead water conservation by example

Focus group participants had expectations that 'the council' lead the way demonstrating water conservation practices, though they were unclear about which council this was (regional or territorial). This included the use of water-saving techniques on its own properties, fixing leaks quickly, and fairly apportioning the cost between domestic and business use of water. There was a perception by some that 'the council' does not meet its own water conservation obligations, and that 'the council' itself wastes a lot of water.

I thought it was 30-40 per cent of Wellington's water is wasted through broken pipes, and this is the council's problem, because the council won't fix those pipes, so here it is the council trying to make us save water when they are not fixing their own.

Pouring it on our parks, that's one thing that gets me, in the middle of summer when they are telling us to conserve water and you can use your sprinkler on your garden that night but not the next night and you look at the parks around the city and you see them [for several hours] bucketing water on even in bright sunlight when it burns off the most.

## Difficulty for councils in communicating with residents

Focus group participants from the Wellington region did not seem aware of any 'council' communications relating to forward planning for water. For group participants there appeared to be both a sense of stealth and a sense of inevitability around activities related to water metering, fuelled by wariness of motives for introducing it. It did not seem, to group participants, that they had been part of a process where the council responsibly and proactively planned for the future and clearly communicated with them. There was also a degree of misinformation evident, possibly due to miscommunication.

Yes, everywhere they go, [say] an old street, they have been doing it over the years. So when they go and do work on the water then it is a standard, I think, to just chuck in a meter. And it is ready there for one day [when] they will be able to meter you.

So it's really introduction by stealth?

Yeah, so you will probably be quite surprised at actually how many meters are around the Wellington suburbs.

So any consultation is probably a farce if they are already putting it in, then all they are trying to do is soften you up to say that oh yes, yes I really want it.

I don't think that at the last election anybody spoke about water metering.

I know what they want to do is start putting meters just for the council's own data collection, in certain suburbs, just because apparently Wellington uses up four times the amount of water as everyone else or something like that and they want to know if there is a leak in the system first, because at say 2 o'clock at night the water is still flowing in Johnsonville or something.

But on the other hand, it seemed that group participants did not really want to engage in water-planning discussions, rather they wanted water to be 'on tap' as cost effectively as possible. Part of this reserve to be involved related to a lack of knowledge and expertise to make informed decisions about the future, and a lack of knowledge about the need for water conservation.

I just feel like it is, they have been talking about it for a number of years – to be honest it's just that inevitability. And I am not sure what the resources are like down in the Hutt where they get the water from. There may be time where perhaps that's maybe getting a bit old or something, might need to update it maybe.

Well, not being a water expert but I think they will just need to build more resources ...Yeah, I think there probably comes a time when that probably needs to be replaced and they need to get the money from somewhere and they will do user pays I think, that is what the council is doing anyway, you pay your rates and everything is user pays, your rubbish bags or whatever, so that will come as well.

I haven't heard anything about it and I don't think I would go to the trouble of trying to find out about the infrastructure because I think that it will probably ... annoy me even more.

If it [information about water infrastructure] is not obviously available to us, who is going to spend their time Googling that?

## **Perceived advantages of household water metering, Wellington (non-metered)**

Group participants were asked for the potential advantages of water metering. In general, groups continually returned to the disadvantages of water metering. The main advantages of water metering were perceived to be that users pay for the water used, leaks will become more apparent, households will become more aware of the water used, and that some may save in water bills from their more frugal use.

### **User pays**

There was a sense that a user pays system of household water metering could apportion cost more fairly to heavier consumers of water.

I think that user pays is good, I firmly believe in it, why should you pay for someone else's wastage of water?

People will be more conscious of what they are using.

The advantages again is the user pays ...your neighbour always has a sprinkler running 24/7 and out there clipping his lawn and mowing it and every time as well, and [it's] like a golf green, then he can pay for it. Or his pool, he fills his pool up and empties it, then they can pay for it, those people that use a lot of water.

Despite this, focus group participants were generally not keen on this option.

### **Identify leaks**

Another advantage of household water metering was that it would assist households to identify water leaks and reduce waste.

That could be a good thing if you metered water, that's going to show up leaks, people are going to go oh my gosh there are leaks, why am I using so much, that's not me, oh I have uncovered a leak.

However, there was a sense that in the first instance it would be difficult to judge what a normal water bill was, and hence it might take a while to identify leaks.

It takes a while, you have to talk to people and go okay have you got the same kind of household as me, how much are your bills, because that's how we seem to find out information. It is not from looking online or anything because that is not indicative of the usage, it is from talking to other people who have the same kind of [household] dynamics.

## Save money

Some group participants thought that they would save money if household water meters were introduced, as they have low water use. These people tended to be from small households. It was expected that households with lots of children, particularly teenage children, would be the worst off.

I actually think we are going to save money... Because we don't use a lot of water and we are paying for people who are using a lot of water, so it is dependent on whether you are a big water user.

I have four adults/teenagers whatever you want to call them, and I am chewing through a lot of power, and a lot of water, so I can't control them in the shower because they just don't listen unless I turn the hot water off.

Participants thought another advantage of household water metering was that the system would impose a personal responsibility for water use. But because few people could see how they personally might reduce their water use, they tended to think that it would be others who would make savings.

A lot of people waste water, water the garden willy nilly, wash the car every [few] days, shower like mad.

Wellington focus group participants were more critical of the need for water metering and were therefore generally opposed to its introduction. The barriers to water metering include a lack of knowledge of the water conservation issues in the region, and a perception that there is a plentiful, unlimited supply available now and in the future.



## Appendix 2: Selecting a new washing machine

*The following is the full report from the new qualitative research on selecting a new washing machine. This research was conducted by Judy Oakden Consultancy for the Ministry for the Environment in May 2009.*

The focus of the new qualitative research on selecting a new washing machine was to understand where Waste Watchers purchasing washing machines get their information from and what influences their purchasing decisions. This section aims to provide a greater understanding of the channels of influence relating to those purchasing decisions.

The approach to purchasing a washing machine depended on the context. If the purchase was unplanned, as a result of an unexpected breakdown, the purchase process was often undertaken over a matter of days. When people were time poor, they typically made a quick reactive purchase based on the washing machines available in a range of stores at the time. The store visit was vital in this situation. The main purchase drivers were cost and convenience, especially in households with children.

In households making a planned purchase, the old washing machine often had been repaired several times. During the repair process, owners obtained feedback from the repair staff regarding reliable models as part of their information gathering. Considerable effort was made to assess the reliability of different models of washing machine. In some cases, this included assessing the ongoing costs, including power and water costs, warranties, delivery etc. Purchasers then waited to obtain the model of their choice in the sales. Obtaining a 'good deal' was important.

We did not pay on top [for the warranty], but we got a deal I tell you.

I think that ...big ones [stores] you can always say to them, "hey what kind of deal can you do?" ...And then they always go away and they do their little "see what I can do for you", refer you to the brochure which tells them exactly how much they can discount to and it is already agreed anyway. And then come back and go "hey, I can do this for you", it is already a set thing.

There was a wide range of information sought about washing machines prior to their purchase. Key aspects were obtaining a good price and/or deal, followed by reliability and/or durability and/or brand reputation. The physical size of the machine was important, particularly in smaller homes. The capacity and configuration of the machine (top loading or front loading) were also considered. Features such as the different washing cycle options were also important, as were warranty, and delivery and installation options.

Focus group participants were not aware of the significant contribution to the total household water consumption of washing machines. Instead their major concern was power use. They commented that they tried to keep their power bills down, so a machine that did not consume a lot of power was attractive.

If you are using cold water then the power doesn't come into it, but if you are using hot water washes as well, well then it's probably [depends on] ... how much water you use.

There was also an interest in washing machines that did not use a lot of water, to minimise the use of hot water and hence minimise power costs.

So if you use less water you use less power to heat it.

There was also, to a lesser extent, a desire not to waste water in both Wellington and Auckland. The energy-efficiency and water-efficiency labels were key communication devices to communicate cost efficiency to Waste Watchers buying washing machines. The

frugal nature of Waste Watchers appeared to be the major driver in obtaining these efficiencies, rather than a desire to be environmentally responsible.

It was more like the cost was the key thing and the power usage and the water usage I looked on the stickers and it was like just reassuring to know they were reasonably economical. It wasn't a key sort of choosing factor, but it was just like I can be sure that this is economical to use.

Table A1 summarises the different types of information sought at different stages during the purchase process. For some washing machine purchasers, typically unplanned purchases, this process was undertaken in a matter of hours or just a day or two. For other, more planned purchases, the decision-making process was conducted over a longer period of time and for some, took up to two months.

**Table A1: Information sought at various decision stages for washing machine purchases**

Decision stage	Activities
Stage 1: Initial thoughts	<ul style="list-style-type: none"> <li>• Determine the options – new machine or repair old one.</li> <li>• Past experience, history and preconceptions of brands.</li> <li>• Retail store window-shopping.</li> <li>• Identify possible constraints (price, brand reputation etc).</li> <li>• Reflect on particular likes/dislikes and requirements (eg, size of space for the machine).</li> <li>• Consider individual preferences.</li> </ul>
Stage 2: Begin investigation	<ul style="list-style-type: none"> <li>• Discussions with repairman.</li> <li>• Retail store visit (look at all the models available).</li> <li>• Possibly discuss with salesperson (but many salespeople considered ill-informed about product).</li> <li>• Discussion with friends and family – word of mouth.</li> <li>• Internet searches to find out what the options are: manufacturers' websites, retailers' websites, Consumer, TradeMe and internet forums to compare different brands and establish what is available.</li> </ul>
Stage 3: Weighing up the options	<ul style="list-style-type: none"> <li>• Arrive at some options.</li> <li>• Determine which machines are available in the price range.</li> <li>• Assess aspects such as reliability, cycle features, warranties.</li> <li>• Assess what the ongoing costs might be – parts, power, and to a lesser extent water use.</li> <li>• Flyers (important source of information): price, machine features, power and water efficiency – all in a snapshot.</li> </ul>
Stage 4: Final purchase – getting a 'deal'	<ul style="list-style-type: none"> <li>• Aim to get the best deal price-wise – negotiate with salesperson.</li> <li>• Also consider how much the ongoing costs will be: power, water, are parts available for repair?</li> <li>• What is available now?</li> <li>• Delivery and/or installation – an issue for some, but not others.</li> </ul>

As table A1 identifies, there were a wide range of fragmented sources of information used in the decision-making process for purchasing a washing machine. In terms of the formal communication channels that marketers can access, store displays were vital. Washing machine purchasers often visited several stores to see what was available and assess their options. They depended on the printed material (which was from either the manufacturer or the retailer), that accompanied washing machines on display in a store, as a key source of information.

Mega centres were great because you could slide around the retailers really quickly and cover a lot of ground.

There was those little snapshots on the washing machine that give you like the blurb in the store which was quite good information.

Participants commented that retail sales staff were typically of little use in the decision making process. This was because they often lacked detailed product knowledge (eg, just reading the one sentence description on the store price/information display). When retail sales staff were well informed (in the minority of cases) this service did not necessarily guarantee that salesperson a sale. For Waste Watchers, the salesperson also needed to come up with a 'deal' to secure the sale.

I mean I find that most of the time the salesperson can't really tell you all the nitty gritty. They can tell you the price but further than that you ask more questions they will be reading their own [brochure], so it's like you might as well find out the information yourself.

The other main source of product information was from the internet. Many washing machine purchasers reported using internet searches. Frequently accessed sites included manufacturers' websites, retailers' websites, Consumer, TradeMe, and internet forums to compare different brands, and establish what was available. Some washing machine purchasers then made direct comparisons between the different brands and models to find the range of features they required. Retail websites were used to establish availability and price, and look for deals.

Retail flyers contained vital information for Waste Watchers purchasing washing machines. They provided some of the key information about cost and also headline information about size, capacity, functionality, availability and efficiency. Other than retail flyers, media advertising was infrequently mentioned both in Auckland and Wellington.

I had [one washing machine] on order at [the first store] and they were taking too long and the [second store] mailer came in the mail. And they had the same sort of deal for about the same price. So I cancelled [the first order]...and then went over there [to the second store] and picked that one...so [the first store] lost out.

Washing machine purchasers also relied on informal channels of information when deciding on a washing machine. The purchasers drew on their own knowledge and experience and that of family and friends. In some instances, the decision to purchase a washing machine was made jointly, but often the main user had the most input into the decision.

I went for the top loader because my husband hates front loaders; I have got no idea why.

Waste Watchers also reported they perused TradeMe, internet forums and other websites to find out about the reliability of washing machines.

In summary the purchase of a washing machine was complex with a wide range of factors considered. The first 'tier' of factors considered by Waste Watchers was cost, reliability and some aspects of functionality. Energy efficiency and water efficiency appeared in the second 'tier' of considerations as the following quotes show.

I think it would be in the top six, functionality, funnily enough looking back at it now, it seems a bit silly, but delivery was important at the time, price, size, reliability, not warranty, deals, that's the price, after those [water efficiency], so in the top six.

Price, deal, functionality, warranty, and then water efficiency.

Price, size, reliability and then the water efficiency.

Simple communication was powerful, and the water- and energy-efficiency rating stickers had impact. Most recent washing machine purchasers in the groups were already aware of the labels and had seen them. The water-efficiency labelling provided a benchmark of sorts, and enabled comparison between different washing machines. In addition, there was very little confusion between water-efficiency and energy-efficiency labelling. Energy- and water-efficiency labelling were clearly understood and factored into the purchase decision.

There is a bunch of stickers on the front and then there's the red ones are the power ones, and the blue ones are the water consumption, and with the water consumption they have stars I think but it also says how many litres it uses for a cold water wash in blue.

I actually went from a F&P 5 to a 5.5 based on the water rating. Because one was like a 2 and the other was a 2.5 and there was only half a star in it, but I thought there has got to be a difference in that on cost, on water cost.

However, there was also the expectation amongst Waste Watchers that the most energy-efficient and water-efficient washing machines were also likely to be more expensive.

I looked at a couple of models and the ones that were actually less water-efficient were slightly cheaper than the ones that were efficient.

The use of water-efficiency labelling on washing machines appears a highly effective way to convey efficiency information, as it was communicated at a glance and was easy to understand. An additional benefit of the efficiency labelling was that it was large enough to be seen in the pictures on the flyers, so that the information had more chance of becoming part of the final purchase decision.

Waste Watchers purchasing washing machines appeared to lack an understanding of the contribution of washing machine use to overall household water usage. In addition, the number and nature of the factors considered in their purchase of washing machines is already very crowded. Any further communications relating to washing machine water efficiency needs to compete with lots of other competing information.

It was harder work than I thought it would be. And it is quite a big drama to buy a new washing machine. And I thought 'god am I just making a mountain out of a molehill just go out and do it', but when you speak to other people it is a big deal and there is a lot to factor in.

## Appendix 3: Watering the garden

*The following is the full report from the new qualitative research on watering the garden. This research was conducted by Judy Oakden Consultancy for the Ministry for the Environment in May 2009.*

The focus of the new qualitative research on watering the garden was to gain an understanding of garden-watering behaviour, particularly about attitudes around wasteful watering and how decisions are made about how frequently to water, which can then be used to inform communications and interventions, particularly for local government.

### Benefits of a well-watered garden

Focus group participants observed that on a rational level, when a garden was well watered it had nice looking or damp soil, which was easy to weed and work with. A well-watered garden was green and fresh and the plant foliage was glossy, colourful and healthy – for instance silverbeet would be upright or crops or fruit would look good.

On a more emotive level in a well-watered garden, group participants maintained they would ‘smell the dampness in the soil’ and see ‘luxuriant, lush, healthy foliage’. A well-watered garden ‘triggered the senses’ and group participants talked about ‘breathing in nature’, the perfumes in the garden, enjoying the ‘wonder of nature’ and noted the garden was ‘therapeutic’. For them it was gratifying to be in the garden, and a well-watered garden was ‘a job well done’.

### Awareness of effective watering

Amongst the Waste Watcher groups in Auckland and Wellington there was a range of awareness of how to water effectively. Some were very knowledgeable, others less so. Watering approaches used varied according to the type of garden, time of year, and time available for gardening. While some gardeners had established routines in the garden, many were opportunistic in making time to attend to the garden. Some of the efficient watering techniques in use are also effective gardening techniques in general. Although Waste Watchers were concerned about being wasteful, they were generally not aware of the contribution of garden watering to total household water use.

### Effective watering practice

Some Waste Watchers claimed to have routines related to watering their gardens in terms of regularity, consistency of approach, time and frequency of watering (which were at times mitigated by circumstances). While Waste Watchers were knowledgeable about effective ways to water, there was little evidence that this knowledge was always put into practice. Effective watering appeared to be highly subjective, with respondents believing their practice was not as wasteful as that of others.

Many Waste Watchers knew that thorough and less frequent watering (once every three days to once a week, for an hour or two) was more effective than light and frequent watering (every second day for half an hour).

Few Waste Watchers used timers for irrigation systems; instead they turned the irrigation system, sprinkler or soaker hose on by hand or used a hand-held hose or watering can to water their gardens. Sprinkler owners tended to turn sprinklers on manually rather than use timers. This sometimes resulted in waste if they forgot to turn them off after a couple of hours.

Mine doesn't have a timer, I am the clock, I just keep an eye on the weather and say it's been dry for the last few days so I'll run it for half an hour and after half an hour I would go and make sure the sprinkler is working and just go and turn it off.

We go and turn it on and have it on a timer... Probably about an hour.

Sprinklers were highly visible, and the time, frequency and spread of water from sprinklers was seen as either effective or wasteful depending on how they were used. Waste Watchers were concerned to avoid overwatering, and saw water runoff or water-logging as undesirable. Waste Watchers were particularly scathing of neighbours who used their sprinklers all the time, regardless of the weather.

My neighbours have got one and they just leave it on and can be pouring with rain and their sprinklers will still be going... It drives me crazy... It just was waste, all that fresh water going out into the garden for no reason, and often they have even got it on so powerful that it waters our garden as well.

Hand-held hoses were used by many to water the garden. Benefits were that the hose watered specific areas, and that in many instances participants had to choose to water the garden when using the hose.

The advantage of a hose is that assuming that it is a hand-held hose, is that you are putting it where you want it to go, rather than watering the whole back garden.

With the hand-held hose you are making a conscious decision to go out and water, and so you wouldn't tend to do it on a wet day, and if you felt that it wasn't needed.

Watering cans were seen as a particularly effective way to deliver water exactly where needed.

I use a watering can for the tomatoes because I know then how much a good soak is, and I know if I use two watering cans full I have only got a few plants I know how much each plant has got and therefore I only need to water every couple of days.

Those who used hoses or watering cans needed to make time for the activity. For those who loved gardening, the opportunity to water the garden was a welcome respite in a busy day. For those who felt obligated to garden, garden watering was another chore in a busy day.

Some Waste Watchers only watered if there had not been rain for several days. Some of those with watering routines watched the forecast and watered in the early morning or evening, if they thought it was not going to rain.

Others were opportunistic in the timing of watering their gardens, and gave them a good soak when they remembered. For many who were time poor, gardens were watered when time was available, and this was not always at the optimal time for the garden.

Well for me it's just basically opportunistic and based on what time I get home and do I think it's going to rain and if I don't think it is going to rain and then there is still half an hour's daylight left I will stick the dog on a lead and drag him out to the front lawn so he can bark at everybody going up and down the street and I will water the garden.

It's knowledge intensive for me as well, it's time intensive because I am not particularly good at routine... if I don't remember to water my plants or my garden once a week, you can really see the effects of that.

Group participants agreed that it was best if the drainage and irrigation of a garden were well planned at the outset, but noted that there is not always the opportunity to do this easily.

You've got to have that forward planning though, sometimes, if you are setting up a garden... I set up planter boxes, and then I thought about irrigation afterwards, and thought oh bugger I should have done this earlier, and put some hoses underneath.

If you are setting up a garden then it's ... thinking about it, but if you have already inherited an established garden then it gets hard to put one in.

There was evidence that some gardeners had adapted their gardens to make them easier to manage – for instance using mulch, improving the soil over a number of years, or adapting the planting style.

I use mulch as well so I don't have to water, I am always away for the hottest part of the summer, so my plants always die if I don't mulch before I go away, and we don't have anyone water them while I am away.

I try to mulch as well...it was a city council thing saying that especially when the water drought was on, they were saying that if you mulch then it's going to retain more moisture in the soil.

There was also evidence that some Aucklanders used grey water in their gardens.

But many in the Waste Watchers group in Auckland felt that other than when there were restrictions, there was plenty of water, you just have to pay for it.

No we nearly did [have restrictions] but we haven't yet, thank god.

[The water supply here] it's good...there is plenty.

You can just use it, you just pay for it and you use it.

You pay twice for it but you can use it all the time.

If you want to have a lovely garden and veges and all that fruit and things like that ...you just do pay for it [water] each week.

While commentary in news media reminded Waste Watchers not to water too often, in their minds this related more to water shortages during droughts, than water conservation in general.

I think that mostly most of my feeling about that is they are negative prompts or like negative about 'we are going into a water shortage so don't use your water', so the garden is the first thing you shouldn't water or something, so mostly I find the media [gives] negative kind of commentary on how I might go about using [water].

On the other hand there were also a few participants who were aware of the need to conserve water, but overall Waste Watchers felt concerned not to 'waste' water (rather than conserve it). Waste was defined as watering the garden when the garden is clearly damp or there are even pools of water, or overwatering – where there was water running onto the footpaths from the garden. It was considered wasteful to use high-powered sprinklers rather than a concentrated soak of the garden, as was watering when the sun was high.

## Indicators that the garden needs watering

Indicators that a garden needed watering were both rational observable aspects and less tangible, more emotive aspects.

### Rational indicators

Some Waste Watchers maintained they assessed the soil condition to determine if the garden needed watering. Some checked below the surface – the odd person had a probe for checking.

I have got a moisture probe, which my kids gave me for Christmas and it's really useful... It's about that long, you put it into the soil and it tells you how wet it is down underneath, where you can't see it.

I've got my finger, if it's nice and moist it's good enough for me... Probably [probe down] about that far down, 15 cm maybe.

Another clear signal the garden needed watering was if plants were droopy, losing leaves, looked lethargic, or if there were lots of insects on plants.

I think knowing your plants really because they have individual needs and it is not just one size fits all as far as watering goes, so you really have to know your plants and what their requirements are.

Dry weather for an extended period was also an indicator that the garden needed watering.

Maybe there is something really intuitive happening and ... smell rain when it comes and maybe we can smell the garden needs watering when we go out, I don't know.

Well ...it might not rain for three days and then I might still keep thinking the weather forecast is telling me rain is coming so I might let it go longer than that, and if I let it go longer, it has maybe gone as long as a week, especially for being lazy about not wanting to go out and water the garden ...it wouldn't be a question of using less water, because I am just using all this water now, so it would be a really big soak.

Waste Watchers were also more likely to water new plantings more frequently because they needed more intensive tending.

I would only water my veges as a rule, I don't tend to water the other plants, like if they are new in the ground and I have just planted them I do, but once they are established ...I don't water them as well.

Waste Watchers preferred not to waste water, but other than when there were restrictions, they were prepared to water the garden even at sub-optimal times if that was the only option.

And if you have got really flash visitors coming you go and water the garden a couple of hours before they get there and by the time they get there the plants are ... so nice to see you.

However, many were prepared to adapt to changed conditions, when required, and many recounted stories of growing up on tank water, or experiencing water shortages on holiday.

I grew up with we only had tank water so we did actually have to save the water from washing because we couldn't water the garden, my father had a huge half an acre section which a quarter of an acre was the veg garden and he couldn't water it much at all, mind you we lived in Southland then so it was a bit different, but it could still be dry but not as probably as much as here.

Therefore having had a tank water living experience you have got some almost in-built things about conserving water or not being wasteful with it, and then having to conserve it more when it gets really low, and we don't people don't have that now.

## **Emotive relationship with the garden**

There was a highly emotive relationship between some Waste Watchers and their gardens. At the most positive end of the spectrum, for some, watering the garden was a 'time out' relaxing activity.

I find it quite a pleasant experience, especially on a summer's evening, standing out there.

Well it's just work stops, study stops, everything's very peaceful and you just stand there holding the hose and watering all the plants which are growing beautifully and it's a very peaceful moment.

Others used garden watering as a chance to spend time with children, and gardening was an important skill some parents wanted to share with their children.

I don't enjoy gardening [but] I like the idea that I am contributing, you know do your little CO<sub>2</sub> thing, home for the birds and all that kind of stuff, the bigger picture stuff, and that my daughter actually gets, because New Zealand is known for being green, so that's a big part of it too, I can't live in a house without green stuff around.



During the summer we were watering every second day. I used the watering can, because it was fun for my kids to use the watering can, but also like teaching them about life and seeing the things grow...but also knowing how much water you are using.

For others, gardens were domains for relationship negotiations. Sometimes the 'main' gardener expected their partner to water the garden as their 'contribution'.

I really just assist my wife really, she's the main gardener in our household, but whatever I can do to help.

For us and probably my wife is a bit more disciplined than I am, but she heads out to the front and I head to the back so when she is going I head out to the back, if she is not going then I don't, that's not strictly correct, when the plants are small and vege plants through the summer it's really every second day, the social thing we head off in different directions so it is not really social, it's time out on your own, it's good time out.

Other times they felt guilty if they did not maintain the garden to the parent's instruction. Not watering the garden could be a sign of neglect, and the adult children felt particularly guilty if plants seemed 'stressed' – especially if their parents were visiting.

My mother-in-law, she is a constant reminder, I need it, I am really terrible... Because she knows that we are really bad, when we do it we have lots of fun, but we forget.

I ask my daughter if she has watered the garden, the plants that I have put there, because if I put them in and they die...

In some suburbs there was social pressure from neighbours and from others, from seeing what others were doing, or from wanting to keep up with others to maintain a healthy looking garden. Waste Watchers were likely to water their garden to ensure it looked similar to others in the street.

Well I'm just thinking too that I think home ownership is a factor here, when I look back I didn't really get enthusiastic although my parents were keen gardeners, I didn't get enthusiastic until I owned my first home, and then there was a commitment to creating that whole environment around my home.

If you are proud of your house and your neighbourhood then you are more likely to make sure the lawns are mowed and the garden is watered.

I think another big advantage is possibly the value that is probably added to your property, having beautiful flowers in the garden.

I think it might be the neighbourhood too that you live in, because when we used to live it was quite a posh place and everybody's garden was so nice, I think we were the youngest couple in the neighbourhood but you know, you felt like you had to live up to their standards.

For some, their garden was linked to their self esteem (how they felt about themselves) and their self identity (how others viewed them).

Well the first person's house we go to with my friends and family is the one who's got the beautiful garden out the back, the picnic table or the BBQ area.

Our garden part of it is quite sentimental because my placenta has been planted in it under one of the trees so from that perspective it is quite a special little, we planted a particular plant in a particular place and so it is quite a spiritual or whatever.

And finally there was also a sense amongst group participants that gardening is an iconic New Zealand activity, especially the pride of growing fruit and vegetables and allowing children to play in the garden with the hose.

It's kind of part of the New Zealand psyche isn't it, the old ...grandparents grew the veges and fruit, and you never have to go far to see it, and it's nice to be able to be a part of that.

It's almost like a worthy investment in it because you know there is going to be something tangible whether it's enjoying it with your friends, got your veges whatever, you know that if you put something in, you are going to get something out of it.

[At] a dinner party and you are producing what you have grown in your own garden I think people are more impressed by that sort of thing.

I love to see them [the children] running around and having fun, but you are kind of aware of the water sort of zapping through 15–30 litres.

You just take a deep breath and look around yourself and say 'thank god I live in New Zealand'.