Appendix 2a:

Draft Water Conservation and Efficiency Plan submissions

All of the submissions received during the consultation period of 30 August until 15 October have been collected and presented following (verbatim) with an overview provided. Where a submission is lengthier than most it has been included at the end of the table with comments provided following. Late submissions have also been included.

#	**Submitter** **Suburb** **Submission type**	**Submission**	**Overview**
1	D Osborne Normandale On-line submission	DON'T meter water, cut the council salaries instead. Wellington has far too much fresh water to warrant meters, the council just needs to stop being so inefficient with all the water the region has in the first place.	Opposes water meters.
2	A Kelly Mt Victoria On-line submission	I am strongly opposed to water meters and tariffs as the rates we currently pay are very high. The amount of rain we have in Wellington should be utilised in a more efficient way.	Opposes water meters and associated charges. Refers to greater efficiency in rainwater use.
3	A Osborne Hataitai On-line submission	How dare the Government allow this blatant act of piracy; water metering is evil. What's next a tax on the air we breathe? He who has the power to tax has the power to destroy.	Opposes water meters
4	Sustainability Trust (P Squire) On-line submission	Refer page: Appendix 1 / 24	Conservation with subsidies for in-home assessments and interventions. Role for community workshops with incentives for adoption of rainwater tanks across the community. References use of efficient technologies and development of 'robust' steering committee to oversee planning.
5	J Lenihan Island bay On-line submission	Refer page: Appendix 1 / 25	Supports conservation measures, education, rain-water tanks and use of grey-water. Opposes meters and use of volumetric charging.
6	N Artemiev Kilbirnie On-line submission	Please do not introduce meters and make us pay for water in Wellington by metering. This action will make Wellington a less desirable place to live. The city will become an ugly dry, barren, desolate place in summer when gardens are not watered (because people will not be able to afford to water their gardens). On one hand we're told to green up the place, grow our own vegetables and then we're punished in the pocket when we water the plants. Water meters will provide people will have another reason why they won't come to live in Wellington. It will become just like Auckland in that respect. Please just build another dam and let's use what comes out of the sky instead of watching it wash into the sea and going to waste. Let's do the sustainable thing by capturing and using the water we are given. A dam could easily be built big enough (somewhere in the Hutt valley hills) that not only meets the region's requirements for many years to come but	Supports supply augmentation options (dam). Opposes water meters.

		as have the capability of providing a supply to a water export business. We could sell our water to help pay for dam construction costs. I think it would be a good idea to build a new dam now as opposed to a later date as costs will undoubtedly escalate. Introducing water meters is just adds expense. There are costs in building a dam, but when it's done you have an asset. Many thanks for taking my point of view into your considerations.	
7	D Ellison Hataitai On-line submission	I prefer water metering. I would not want restriction on house washing- it is essential for maintenance, but I am sceptical that house washing is a significant use of water since I would wash my house less than yearly. Extend water use restrictions to car washing. Use water restrictions more frequently & more strictly. Have total sprinkler bans in majority of years. Have additional restrictions most or all years, to make education easier, make it more worth using grey water for the garden,& encourage drought resistant plants. Fines are simplest penalty. I disagree with the concern about the impact of water charges on large families. To have a large family is a choice with economic impact, and the cost of water charges is small compared to the other costs of raising a child. Lobby government to get water efficiency into Building Code.	Supports water meters, extension of water restrictions with fines used, encourage use of grey-water and drought resilient plants. Also supports changes to Building Code to include water efficiency measures.
8	J Davies-Payne Thorndon Email submission	Option 1: I prefer to live with restrictions on water usage when necessary. Households should be encouraged to install collection tanks for rainwater and brown water, to be utilized where the use of high quality reticulated water is unnecessary. This can be achieved by council bulk purchase of tanks and grants. Option 2: The follow up option is the construction of another dam, as and when the population growth makes it necessary. Option 3: I am opposed to the installation of water meters in private dwellings. The considerable cost of installation and the ongoing cost of billing would be counter productive, as I do not believe that people are profligate with the use of water. A negative effect of water meters would be that people on low incomes restrict the use of water, to a level where hygiene is compromised, with consequential impacts on the public health system, children's education and the local and national economy.	Supports use of restrictions when required, rain- and greywater reuse should be encouraged. Supports supply augmentation options as a follow-up to above. Opposes meters in private dwellings and refers to the negative social impacts.
9	B Geraghty Email submission	For years I have watched rainwater pouring down the drain & thought 'what a waste.' I was very interested to see that plastic water tanks are now available & suggest subsidising the installation of tanks so that many more people could use grey water. Educational advertising would also be helpful. I am a retired person & always take steps to conserve this precious resource. Please be aware that many citizens like me are living on very limited incomes & price increases for utilities are crippling. Thank you.	Supports use of education based advertising and re-use of rain- and greywater. Warns of impacts of any increase to cost.
10	R Grieg Te Aro On-line submission	Based on previous experience I expect that this consultation will be another farce, with council officers having already made up their minds about what it wants to recommend. For what its worth, when considering a future water supply the city needs to look ahead by about 50 years. Current	Supports supply augmentation options with reference to the use of restrictions. Opposes water meters and

		water restrictions can still be applied but in the long run, a new dam and/or water collection & storage facility will be required. I prefer this option. I oppose the option of water meetings and charging for water based on usage. I know all the arguments about using pricing mechanisms to restrict the depletion of a scarce resource, however, I do not believe that this is the best option, on the basis that it will disadvantage large families and will ultimately lead to privatisation, price gouging (with no competition) and ultimately excessive profit taking. Water is essential for life and should not be reduced to a marketed commodity.	volumetric charging
11	P Tunnicliffe Karori On-line submission	No to water meters and tariffs. Increase the water supply.	Opposes water meters and tariffs. Refers to increasing the water supply.
12	C McLean Waikanae Beach On-line submission	I think that regardless of which option is pursued, that much greater emphasis needs to be put on reducing off take on the council supply through greywater and roof water storage. I think this needs to be encouraged through some form of rates subsidy (or tariff subsidy in the event of water metering) to encourage purchase, installation and actual use of such systems. In the event of water metering, I don't think there should be any usage limits imposed, just dry season charges that send a significant price signal to users.	Supports use of subsidies to encourage rain- and greywater re-use. Makes reference to water meters and tariff structure to deter dry weather demand.
13	N Holland Karori On-line submission	I am opposed to the notion of introducing water meters and tariffs for individuals/citizens. I believe citizens pay enough in rates to cover the cost of 'free' water. In Wellington there is no shortage of water to warrant citizens bearing additional costs aside from rates. Compared with Christchurch Wellington has more water or a poorer drinking quality - yet they do not have to pay for it. Nor should Wellingtonians. Please consider this model before making any changes. Thank you.	Opposes meters and any additional costs for water supply.
14	J Macey Vogeltown On-line submission	Refer page: Appendix 1 / 25	Supports use of education programmes in schools. References support for use of restrictions and meters where necessary, References use of legislative tools and changes to Building Code.
15	C Healy Broadmeadows On-line submission	The importance of a secure water supply cannot be understated. There is no one solution, but likely to be a combination. I believe the preferred option should include: (1) water conservation measures, (2) the inclusion of water meters, (3) the proliferation of domestic rain water tanks. (1) These are well outlined in the draft plan (2) water meters work - they reduce consumption and therefore the requirement for expensive additional dams. Low income users can be incorporated through the use of X litre allowance per water meter at zero cost and ramping up from there. (3) the draft dismisses the value of domestic rain water tanks - valuable in distributing supply, reducing demand for treated water for the likes of toilet flushing, car washing and garden watering and providing storage in the event of a disaster. They increase the amount of water storage at minimal cost, increase the water catchment area at minimal cost, and supports (1) the understanding of conservation, using what is naturally supplied. As a home owner I am supportive off all three, and happy to	Supports water conservation measures, water meters and domestic rain water tanks. References support for (investing) installing a rain water tank with the “right support from the council,”

		invest in (3) with the right support from the council. (3) also becomes more feasible with the introduction of (2) the water meters. Domestic rain water tanks also provide valuable water storage capacity in the event of disruption to the water supply system as would happen in an earthquake (good risk management/ mitigation). Water tanks can also reduce the amount of water entering the rain water system, being a positive impact in flooding situations.	
16	N Nelson Karori On-line submission	I believe we should... can manage our water supply by conserving water and enforcing regular, longer more stringent water restrictions in times of short supply. I also think the idea of constructing a major dam would also be interesting to investigate as a means of increasing our water supply - Wellington shouldn't really be short on water considering how much rain we get. I am strongly opposed to the introduction of water meters and tariffs.	Supports conservation measures with use of "longer, more stringent" restrictions. Strongly opposes use of meters and tariffs.
17	P Jones Karori On-line submission	Porirua City Council is developing a water conservation educational resource for primary and intermediate schools.	References education based conservation via schools.
18	J Monahan Strathmore Park On-line submission	Incoming council, to continue investing in infrastructure to reduce leakage. To support GWRC proposal. To a new storage lake to more than double Wellington's back up water supply. Could replace plans to build a new dam and save $60 million. (see press release Dominion Post 2nd September 2010)[1]	Supports leak reduction in public network. References support for regional proposal of supply augmentation options.
19	J Wolland Mt Victoria On-line submission	I support item 2: "increase water supply, mostly likely through constructing a major dam. I am strongly against introducing water meters as they do not resolve the problem. Those with money use as much water as they want as it does not hurt their pocket. They will use huge amounts. Therefore no water savings. The rest, middle and lower economic group would be careful with the water because of costs. And we are the group that can ill afford yet more charges. Meters are revenue gatherers only. A thorough study of places (South America) will find meters make no difference, water drips/leaks from pipes. It is education on how to conserve, and quick response to leaking water throughout the region. Also water is included in the rates so why would one want to pay twice. I applaud the Council for looking to the future.	Supports supply augmentation options. Opposes water meters. References education on conservation and effects of leaks.
20	A Gray Brooklyn On-line submission	I do not support any proposal involving new storage dams. Instead I support aggressive water reduction demand strategies including water metering, dual flush toilets and rain water storage tanks for new houses. I am disturbed that 16% of current water is "non-revenue" from leaks, firefighting etc. I would expect WCC to take more effort in replacing old infrastructure. Finally I have no problem with severe water restrictions when we have the occasional dry summer. Brisbane often bans sprinklers, hand held hoses and car washing for months during dry periods. I disagree that even with metering a new water supply dam will be needed sometime in the future. If Council metered water and fixed all their leaks I suspect the current water supply would last for a further 30 years.	Supports meter, water efficient technologies and rain water storage for new houses. Opposes supply augmentation options. References use of more severe water restrictions when required.

[1] Refer appendix 1

21	K Osborne Hataitai On-line submission	Why should I pay again for my water conservation, reservoirs and infrastructure already set up and paid for by my rates? This seems to be another way to get more money out of me, a rate payer. The only advantage is to those organisations set up to tax me again. I am against Water Metering.	Opposes water meters.
22	Wellington Residents' Coalition Newtown On-line submission	Refer page: Appendix 1 / 26	Reference petition (Refer page: Appendix 1 / of main report). Opposes metering. Support promotion of/subsidies for 'alternative' technologies for collection and use of rain water and grey-water. References potential limitation for rain/grey water tanks due to topography. References ensuring businesses are efficient and provisions for WCC to assist in achieving this.
23	M Athea Island Bay On-line submission	The premise of the this question is that a Conservation & Efficiency Plan is required. Wellington does not and will not have a water shortage so why do we need Conservation & Efficiency Plan? The answer is to provide a way for the Wellington City council to with a way to charge for water despite the fact that it already is paid to provide this service to its citizens though rates. A stealth rates increase by another name. A secondary reason is to provide Wellington City Council staff with highlights for their CV's. A Conservation & Efficiency Plan is not required or wanted. Please cease this activity.	Question the need for water conservation or efficiencies in Wellington.
24	J Guthrie Berhampore On-line submission	Short-term approaches for normal conditions: Encourage PRUDENT use of water: 1. Use incentives, i.e., subsidize installation of water-saving devices, i.e., toilets, showers, desert landscaping, gray water diversion technology, etc. 2. Implement FREE plumbing service. 3. REQUIRE water efficiency in new construction plans. Short-term DROUGHTS: Impose restrictions, i.e., ban garden watering, auto washing and impose penalties. LONG-term/last resort but may be unavoidable: Develop/Implement an incentive scheme for meter installation, i.e., each household is permitted to purchase a meter at a subsidized price. Those households receive a free base water allocation and an annual rebate as a percentage of the savings from the scheme. The households that opt out of the purchase scheme will have meters installed and will pay full price for ALL water consumed plus an annual rental charge for the meter	Supports use of incentives to encourage use of water-saving devices and requiring water efficiency in new buildings. Supports use of free plumbing service and meeting short-term demand via restrictions. References incentivised scheme for meters with the use of an annual allocation and rebate for 'savings' achieved.
25	P Bolster Mt Cook On-line submission	I support the measures introduced in 2009, but oppose household metering. Possibly a meter at street corners and reports to residents in streets where usage is well above normal would enhance the educational approach. It may also isolate leakages.	Opposes residential water meters. Supports area meters used to identify and report on areas of high usage.
26	L Griggs Island Bay On-line submission	1. Firstly I am confused about whether or not there IS a water supply crisis, given that the 2010 Wellington Water Supply Annual Report clearly shows that the water consumption has been reducing steadily over the last 5	Questions water supply concerns as GWRC 'Water Supply Annual Report' indicates that consumption

		years in a row, both on an individual crisis and regionally, even though the population has increased. 2. I am opposed to water metering. 3. I believe the control of water supply should be owned and controlled by elected public bodies and not privatised. 4. The council should promote water conservation, and perhaps provide assistance to homes that may have water issues, such as leaky taps. 5. The council should promote and subsidise alternative water use technology to use rainwater and grey water. 6. The council should further investigate water loss due to leaks. 7. Some water restriction such as summer watering is acceptable. 8. If additional water storage becomes a requirement, a storage reservoir would be more cost effective then a new dam.	has been reducing. Supports subsidies for rain- and grey water re-use technologies. References additional leak detection and use of summer restrictions. Opposes water meters.
27	P Dempster Khandallah On-line submission	Refer page: Appendix 1 / 27	Supports use of restrictions. References increasing supply as being too costly to ratepayer. References replacing old infrastructure to reduce leakage. References subsidies for rainwater and greywater reuse as well as water efficient technologies. References WCC setting up 'show' gardens to promote drought resilient plants.
28	R Churchman Kelburn On-line submission	The use of water meters in not supported. The Council should concentrate on fixing water leaks (in Kelburn there are many) and impose water use restrictions. The Council should use encourage residents to conserve water by a variety of means. However, requiring residents to install water tanks will not work for the many residents who live in apartment blocks, or whose properties do not have suitable space for them.	Supports council initiatives to encourage conservation. Opposes water meters and question suitability of water tanks.
29	A Sutton Tawa On-line submission	I feel the best solution to the future demand for water and the shortages of supply that may occur dry periods. Is to build a new storage dam. As any educational program is not going to effectively deal with new demand. Water meters would be too much burden on peoples already stretched budgets.	Support supply augmentation options. Questions effectiveness of education program. Opposes the burden of water meters.
30	J Alston Churton Park On-line submission	I strongly oppose water meters being compulsory as the impact on less well off families and individuals is too high. There are health issues as well as the costs involved. Education is much preferable, and a commitment to fixing water leaks more promptly. A serious leak I reported earlier in the year took two weeks to be repaired losing a huge amount of water.	Opposes water meters. References a commitment to repair public network leaks more quickly.
31	Enviro-Tech (C Williams) Newlands On-line submission	Refer page: Appendix 1 / 27	Promotion for Enviro-tech – water efficient technology, urinal sensors and bathroom technologies
32	T Amar Tawa On-line submission	In support of metering with a specific focus. Changing habits are far more effective if there is a cost attached. I support metering households in Wellington if users only get changed when they use beyond a particular	Supports water meters with structured consumption parameters. References investigating

		allocation. i.e. beyond the mean average usage of a household in the region. What this means: Test meters should be installed in households across the region to determine a baseline for the number of units used and the size of the household and property. This is then extrapolated out over the region and there is a programme of installing meters- Businesses excluded for the time being. Meters are read once a year and any excess usage is added to the homeowner's bill in the following rates year. It is up to the owner to ensure that their usage is tracking according to the mean. At the same time the council could put the revenue into rainwater tanks and greywater schemes and examine what benefits might be accrued by partial subsidy of households that implement such schemes.	partial subsidies to encourage rainwater tanks or grey water re-use.
33	J Harnett Island Bay On-line submission	I would like to see a comprehensive rainfall water collection programme initiated in Wellington. Government could be lobbied to form a partnership with Wellington City Council to provide a scheme along the lines of the insulation scheme currently promoted in New Zealand. Incentives could be provided for tank installation on resident and business properties. Free assessments, rainfall collection plans and subsidised installation. The ability to store rainwater will surely assist in times of water shortage and help to ease pressure on existing supply. It is not a silver bullet to fix the problem but a step in the right direction to promoting water conservation.	Supports rainwater collection with subsidies for both commercial and residential properties. References assessments and 'collection plans'.
34	S Wilkins Karori On-line submission	The focus of most of the water debate that I have been aware of, has been around 'new water', or persuading us to use less. One potentially significant additional tool in the box would be to encourage the use of grey water from washing machines on e.g. veggie patches, and the encourage the installation of domestic rain water tanks for the collection of roof run-off for a whole range of non-consumption uses.	Supports encouragement of rain- and grey water recycling for no-potable water requirements.
35	P Prendergast Thorndon On-line submission	I favour the 3rd option of installing metres and having user charges. Policies on charging can be put in place to protect low income users and ensure sanitary conditions (e.g. a household may be allowed a certain volume of water per day on fixed charges and volumetric charge only kick in above that value). I also consider the cost of installing metres has been greatly overstated by more than double.	Supports water meters with volumetric charging based on consumption over a base amount.
36	G Clemens Miramar On-line submission	There needs to be more action on the Council's leaking water pipes before any talk of water metering is entertained. I think the Council's performance in this respect is lamentably poor and failure to address this will undermine any other water-management initiative.	References requirement for more attention to be given to leaking infrastructure.
37	M Scaife Whitby On-line submission	Introduce a policy of all new dwellings have rain water tanks. Allow existing dwellings a water rates reduction if they install same tanks that supply 80% of their annual water requirements. Allow gray water recycling, e.g. to gardens.	Supports legislative change to require rainwater tanks. References rate reduction for achieving high level of water conservation.
38	K Glassey Newlands On-line submission	Refer page: Appendix 1 / 29	
#39 duplication of submission #38 with blank email received.			
40	Dave P Newtown On-line submission	If it were a choice between the three listed options, my support would be for increase water supply, mostly likely through constructing a major dam.	Supports supply augmentation via the construction of a dam.

41	B Johnstone Karori On-line submission	Do NOT make any charge for accessing a BASIC HUMAN RIGHT! (According to the UN, and my own sense of logic) New Zealand has enough water for its population - this comes into the category of corporate B/S!	Opposes charges for water
42	C Lord Maupuia On-line submission	I am strongly opposed to the introduction of water meters (and therefore more long-term revenue generation for WCC). Water shortages, when and if they occur, should be managed sensibly and logically - not by hitting rate payers in the pocket yet again. Like many households we're already struggling with unacceptable electricity, rate and insurance increases. Imposing water meters would add another financial burden to already struggling households ... for no real benefit. The only winner here would be WCC.	Opposes water meters and increased charges for water.
43	R McKelvie Newtown On-line submission	Have you considered subsidising water tanks for rainwater collection for people that would like to install them in their properties? They water collected can be used for flushing the toilet, watering the garden etc.	References subsidies for rain water tank installation.
44	J Guy-Clement Waikanae On-line submission	No water meters and tariffs.	Opposes water meters and tariffs.
45	J Davidson Broadmeadows On-line submission	I support installation of water metres so that water consumption can be kept track of (and minimised) by householders. I also support council subsidies for installation of water tanks for use in gardening and other non drinking uses. In the long run (10-25 years) however I believe we need to plan for and construct an additional reservoir both for additional capacity and as business continuity redundancy i.e. in case the current reservoirs are damaged in a major earthquake. thanks	Supports water meters, subsidies for rain water tanks and planning for future supply augmentation needs.
46	D Hamblin Johnsonville On-line submission	As a matter of urgency I believe you should wake up Greater Wellington Regional Council to get them to start planning for the new dam as soon as possible. From what I learned at last night's meeting [*Johnsonville Community Centre public meeting*] this is essential to help Wellington if an earthquake should hit the city as well as long term future needs. All other ideas in the report are good but must considered subordinate to the main objective I outline above. I say no individual domestic property water meters .There is not only the cost of installation but also the long term cost of reading, billing, collecting money and maintenance. Thought could be given to storage in flexible membranes rather than solid reservoirs that could easily fracture in an earthquake. Do we need more storage facilities? I believe that a lot could be learned by sending water engineers to countries such as Switzerland where water is processed much more than here. They have larger concentrations of population than here and yet as far as a traveller is concerned seem to have no shortage of good quality water.	Supports supply augmentation in view of risk to city's water supply from earthquakes etc. Opposes residential water meters.
47	S Cranney Titahi Bay On-line submission	Please don't charge us for water! Restrict it!	References use of water restrictions. Opposes water charges,
48	Appropriate Technology for Living Association (ATLA) On-line submission	Refer page: Appendix 1 / 29	Supports rain water tanks – references a number of paper as being relevant and evidential of this approach being suitable.

49	J Fretter Brooklyn On-line submission	I prefer that the Council manage water supply by asking & educating residents to live with the shortfalls by having regular, longer and more stringent water restrictions. The Council is not considering a full range of options in this consultation. Perhaps other Council supported / regulated measures to reduce unnecessary water wastage could also be considered / brought in i.e. building restrictions on having designer washbasins (two beside each other for no essential reason); subsidies for water tanks for rain water collection to encourage reuse of collected rain water for gardening purposes only. There will undoubtedly be inequities created if the Council goes down the route of water metering and user pays e.g. I have never seen a user pays system that adequately addresses the opulence of larger homes with 6 toilets and 3 bathrooms for instance that houses only 2 residents. Some will be unfairly penalised or inequitably charged (there won't be relativity of resources & charges against usage) and to compound this socioeconomic differences will mean some can readily afford to pay and others will struggle. I prefer Council follow option 1 with a review period after 4 years - so long as a concerted effort & investment is made to educate people about usage, wastage and consequences AND that Council consider offering rebates for installation of rain water tanks (water collection for garden use only).	Supports use of restrictions to manage demand. Supports use of education about water usage and wastage with consideration given to rebates for rainwater installation. References inequities of user-pays systems that do not / cannot address opulence.
50	R Weinkove Island Bay On-line submission	Refer page: Appendix 1 / 30	
51	B Viggers Kelburn On-line submission	1) I support the focus being on water efficiency as the primary approach. (2) I support requiring rain (and possibly grey) water collection in new (and potentially renovated) buildings. I note the Kapiti district council district plan change 75 requires this. (3) This may take two-three years to put into place, which is half the time it would take to build a new dam, and could still be done by the 2014 date the council is potentially looking at making a decision by. (4) As well as the regulative stick, providing rates concessions for people who have rain/grey water recovery systems installed would be another way to encourage water efficiency. (5) I note that the council has been replacing slightly less than 10km of pipe a year for the last two years. I also note that there is 1020km of pipe, and it has a life expectancy of roughly 70 years. Basic math indicates that the council should be replacing roughly 15km of pipe a year, a 50% increase. (6) A requirement for properties with pools to have a water meter could be helpful (and a requirement for payment based on water use) (7) A requirement for new or redeveloped properties to have water meters should also be helpful – although initially no requirement to go for a payment based on it. (8) I note Wellington has a large number of tenants. Moving from rates to water-bills may end up putting new costs on those who can least afford them. Water bills should go to landlords not residents to encourage them to have water efficient fittings, water recovery and storage, and to address leaking pipes as a priority.	Supports focus on efficiency, rain- and grey water re-use in new buildings. References concessions on rates for homeowners with rain- and/or grey water re-use systems. References meters for extraordinary supplies (pools etc) and new buildings. References renewals programme suggesting that more should be spent in replacing infrastructure.

52	J Tanner Brooklyn On-line submission	Wellington's water supply and shortfall problem would be resolved if there was no leakage from the councils aged pipes. I am appalled that this was not identified as a method of managing Wellington's water supply. It should be compulsory for all new dwellings to install a tank to collect water from the roof and anyone that has a tank should get rates relief	Supports legislative changes to require rainwater tanks and rates relief for property owners with a rainwater tank. References leak detection.
53	P Jennings Tawa On-line submission	I am in favour of option 1.	Supports use of restrictions to manage demand.
54	S Currier Island Bay On-line submission	I would prefer proposed option 1 of water restrictions when necessary. Dam construction would destroy ecosystems and I don't believe it is fair to charge for a resource every human being needs to survive.	Supports use of restrictions to manage demand. Opposes the construction of a dam.
55	T Park Mt Victoria On-line submission	Provide incentives to landowners and land managers to install efficient irrigation systems or small scale water collection systems on private land, as summer use in gardens is the most critical factor that is driving the need for a new dam. Subsidise mulch for use in private gardens in the city, Start work on bylaws to enable council to infringe water wasters and give out instant fines for misuse or wastage of water (like in Upper Hutt) or prosecution for blatant wastage for profit or reoffending. Start water metering NOW, as this will by the city some time by reducing demand and ensuring the heaviest users pay the larger part of the cost. A flat rate for average or below average users should be used to reduce the cost of administration, with users being able to opt for pay-per-use if they decide. Some landlords bay choose to pay a flat rate on behalf of tenants rather than passing on another variable cost to tenants. Metering has heavily reduced demand in Carterton District, meaning less expenditure on the infrastructure to provide more water. Provide a green plumber service for free for simple services. Investigate supplementary supply systems from groundwater within the city – there are many seeps throughout the city that drain to stormwater that could be used by neighbourhood schemes.	Supports use of subsidies to encourage use of water efficient irrigation systems or water collection. Supports water meters with flat rates for average consumption or use patterns, References use of bylaw to address water wastage or excessive use. References the investigation of neighbourhood springs or sources.
56	U Smith Te Aro On-line submission	The council should be providing more information to ratepayers who would like to change the way they use their rainwater- instead of it going down the stormwater drain it could be pumped to the toilet cisterns and filtered and used in the washing machine plus be stored and used in the garden but the council only thinks about the easy alternatives which are to charge everyone more with water meters instead of doing something which could be more long term sustainable	References rain water collection and re-use in toilets, clothes washing, garden watering etc.
57	G Cole Miramar On-Line submission	My thoughts and the thoughts of the other members of my household are in favour of the water restrictions. It is not necessary to waste water on long showers or extensive car washing in the summer months, and this is infinitely preferable to either the dam or water privatisation.	Supports water restrictions over a dam (or privatisation?).
58	I Butler Strathmore On-line submission	Refer page: Appendix 1 / 31	Supports metering and volumetric charging. References support of incentivising rainwater tanks or ‘butts’.

59	N Mingardo Strathmore On-line submission	I'm in favour of method 2: increase water supply.	Supports supply augmentation options.
60	S Eyre Wilton On-line submission	Personally I believe that installing water meters and fair tariff would be the best way forward. All other utilities you pay for usage, and it seems ridiculous that water is not treated in a similar fashion. In fact, at the moment, people who choose to meter there water are unfairly discriminated against creating a two-tier system which penalises those trying to conserve water.	Supports water meters and a 'fair' tariff system.
61	A Digby Hataitai On-line submission	I strongly support the introduction of meters and tariffs. There's a huge environmental and financial cost associated with supply clean drinking water to homes; purified water that is then used in huge quantities to clean cars and water gardens. People accept paying for electricity and gas; why not drinking water? We need to dramatically change our attitude to water consumption, and the introduction of meters and charges will be the most effective step towards reducing our consumption. Building more dams will cause huge ecological damage, and just defer the problem.	Strongly supports water meters and tariffs, References ecological damage from constructing dam.
62	J Weir Melrose On-line submission	Believe Council should become far more active in its messages about human habits which lead to water wasting i.e. running taps when cleaning teeth, car washing, garden watering etc. Would not like to see water metres or another dam because further financial stress on many households to pay for this. Consistent persistent messages via all media over at least 3-5 years to limit water usage should be effective. Changing habits hard, but just like stopping smoking, will work over time. But start campaign soon!	References need for council to be more active in presenting water conservation message. Opposes water meters and supply augmentation option.
63	G Synders Brooklyn On-line submission	2 considerations: Look at the condition of the water pipes supplying the water - I constantly see water running out of pipes down the storm water drains and have read newspaper articles indicating the poor standard of water pipes Having come from South Africa where there were serious shortages on both water and electrical supply, and having seen the impact of households sparingly using electricity and seriously injuring their backs trying to carry buckets of grey water to water their gardens (I am a physiotherapist and treated 48 people with Lumbar disc bulges in one summer alone from this! - with a public health care system this is a very real and expensive risk) the difference made by households was absolutely minimal and did nothing to the shortfall of supply simply because most of these resources are consumed by industries rather than households. If you have to meter the usage - try metering industrial regions and assessing who uses the most water.	References leak management. References water meters for commercial consumers.
64	S Kurtovich Te Aro On-line submission	I believe it is absolutely critical that Wellingtonians become more responsible about their water usage. It is my view that this will only come about by introducing a user-pays system of having water meters for all usage. I lived in Auckland for 30 years before moving to Wellington and there is not question that dripping taps and leaky pipes get fixed a jolly sight quicker if the wastage they cause is being added to your water bill. No amount of public education campaigning about conservation is as effective as hitting people in the pocket. Let the user pay.	Supports water meters and volumetric charging.
65	D Logan Mt Victoria On-line submission	Water should be kept free to citizens of Wellington - i.e. no water metres on households. Perhaps we can metre businesses? Also, I see that there was a huge waste of water during the	Supports water meters for commercial users. Opposes residential water meters.

		destruction of Manners Mall when the construction crew hit a water main. Perhaps the council should monitor those kinds of things more closely before suggesting citizens pay for water?	References third party damage (contractors) to water infrastructure.
66	S Anderson Karori On-line submission	Having lived in cities that have residential water meters and understanding the process behind them, I implore the WCC to avoid this option by any means possible. Please encourage education to conserve water, encourage water restrictions and educate the community to respect water for the valuable resource that it is. Residential water metering does not achieve this - it merely reallocates the resource to those most able to afford it.	Supports education based programmes to encourage water conservation. Opposes residential water meters.
67	C Begbie Miramar On-line submission	We do not need water metering or charging in Wellington. It should be part of our rates, which we get very little out of anyway, and not as an increase!	Opposes water meters and associated charging regime.
68	M Leighton Newtown On-line submission	I would prefer option 1 which enforces more stringent water restrictions. We currently use far more water than we need and good advertising of water saving measures (short showers, rainwater collection etc) would help. I regularly see neighbours watering their gardens in summer using sprinklers and hoses and most of the water is running off down the street. The current restrictions are not enforced and this would help. Maybe banning anything except hand held hoses or watering cans for inner city housing. Drier countries use facilities like toilets with the sink on top of the cistern (water used for hand-washing is then used for the next flush) and we could start installing these in all council owned toilets, enforce it for new buildings and encourage it for others (at the moment you can't even buy them in NZ). These are used in all national parks and community facilities in Sth Africa. I am against encouraging us to use more water by building a dam and against water meters which penalise the poor and have been shown to increase water usage by the rich (the aim, after all, is to reduce water usage not increase profits!).	Supports the use of water restrictions and advertising of water saving measures. References potential for the construction of a dam to encourage heavier consumption patterns.
69	C Marley Kilbirnie On-line submission	I support option 1: live with the shortfalls by having regular, longer and more stringent water restrictions. If we do this through a public education campaign focused on reducing current wastage then there will be no need for costly projects such as new dams, or water meeting which is widely agreed to be socially unjust, penalising those on low incomes.	Supports more regular and more stringent use of water restrictions to manage demand.
70	T Boon Tawa On-line submission	The only option is build another dam. Water meters will not stop people using water, and any amount saved- if there is some- is going to get used up by population increase. Think ahead and act now- don't be thick like Kapiti council and leave it until it's too late.	Supports supply augmentation option via the construction of a dam.
71	R Fineman Lyall Bay On-line submission	1. I strongly oppose the introduction of universal water meter-age with a system similar to that of Auckland. But a method of restricting excess usage could be applied if the present system of meter-age was made universal, allowing a reasonable amount of "free" water per household before extra charges were applied. 2. The Council also needs to upgrade all the old water mains, and be very quick in detecting and mending leaks which allow many hundreds of litres of water to be wasted. 3. Maybe grants could encourage the collection and usage of grey water.	Opposes universal water metering. References leak detection and upgrading old pipes. References use of grey water.
72	A Bowman Mt Victoria On-line submission	Refer page: Appendix 1 / 31	Supports metering and volumetric charging. References various levels of ineffectiveness of other approaches.

73	I Apperley Strathmore On-line submission	I agree that demand will outstrip supply at some point. However there are two other options that I am not sure have been investigated, or don't come through fully in the document. The first is a combination of approaches, spreading the approach and the risk. The second is the subsidisation of water tanks. This is common in other cities with water issues around the world. The primary reason for water increase in the warmer months must be for gardens as people's other consumption habits are unlikely to change that much. Subsidising water tanks that can be used for watering gardens could alleviate the issues somewhat in conjunction with other measures.	References using a number of options and subsidising rainwater tanks.
74	H Diederichsen Kelburn On-line submission	My suggested way forward: 1. All water use to be metered and charged as per consumption. 2. All sewerage charges charged on the basis of water consumed. 3. In time make water metering compulsory for all household units including rental units. Charging for water and sewage treatment on the basis of property values is a tax. Linking sewerage charges to water consumption increases leverage of user charges to induce careful use of water. It would provide incentives for rain water collection for garden use, use of commercial car wash, fixing water leaks etc. Any social implications can be addressed through WINZ	Supports water meters and volumetric charging. References wastewater charges based on water consumption. References rain water collection and re-use.
75	F Luketina Kelburn On-line submission	I am concerned that the issue of water shortages has focused on a need for rate payers to use less water, when that may not be the main problem. I am no expert in this area, but I can remember at least two expert reports (through the media) over the years indicating that there is a huge problem of leaks from the main water pipes - leaks that are jointly so large, that savings through fixing them might outweigh savings from restricting ratepayers use of water.	References leak detection and repairs on public network.
76	R Barr Newtown On-line submission	I believe water demand in Wellington must be aggressively reduced first, and increased supply only be resorted to in the last instance. Water is a precious commodity, and will only become more so in years ahead, as population grows and climate change alters rain fall patterns. I really like the council's idea of focusing on consumers, and better equipping Wellingtonians to store/save water. Ideas such as subsidies for water efficient fittings and rain water tanks seem a great place to start. I also really like the idea of a free plumbing service. If every house in Wellington had a rain water tank fitted, the amount of water saved would be enormous. As I have stated earlier, I believe that avoiding the construction of a dam is preferable. The dam would have significant environmental impact, and could spread the message that water conservation is not needed. I think Wellington City Council has the potential to transform how we view water and equip us to best conserve and use this vital resource.	Supports subsidies for rain water tanks and water efficient fittings. References that supply augmentation options should be a last resort.
77	S Peeters Karori On-line submission	The councils gives three option to manage water supply. Why is there no mention of reducing water losses due to leaks? A few years ago we had a big leak in the street the leak was not fixed properly for weeks even though the council had	References leak detection and repair to public network.

		been notified. It is difficult to convince people to use water sparingly if the council is not serious about water losses through leaks.	
78	M Taylor Kingston Email submission	Refer page: Appendix 1 / 32	Supports conservation approach. References for metering for swimming pools, spas etc. Supports lobbying central government for regulatory change to ensure water efficiency. References use of restrictions and enforcement.
79	Wgtn Employers' Chamber of Commerce (J Harding) Email submission	Refer page: Appendix 1 / 35	References support for construction of a dam and closer look to be had at benefits from metering. Reference to a preference for volumetric charging over water rates. Generally opposed to regulating for efficiency and subsidizing the introduction of new technologies as these offer financial benefit to the user also. References cost/benefit of leak detection.
80	C Greenwood Karaka Bay Email submission	I oppose installation of residential water meters which is the first step to privatisation and the 35 year contract of the control of our water: experience in Auckland and around the world show that profits are privatised (to the shareholders) and the costs (maintenance etc) are socialised. The poorest and/or largest families in the community would be the most disadvantaged. It is debateable whether Capacity has fulfilled the promise of its creation or whether the large sums of ratepayer money needed to administer it, is warranted. Therefore, I believe it should be disestablished The price of building a dam is expensive in terms of dollars, the environment, ecology, and loss of habitat for native animals. And there is the threat of a major earthquake which would make certainty of supply a risk. Other measures should be considered first. I support many of the measures in the discussion paper: 1. I would support increased education through television, print, radio etc regarding conservation of water. Water consumption has decreased in Wellington which shows it can be done. Education re wasting water should extend to hotels and the hospitality industry in the form of notices etc. as happens in Singapore. 2. I would support encouragement for the purchase of water conserving home appliances such as dishwashers and washing machines, low-flow showerheads, dual toilet systems, and leak resilient plumbing in new houses and as replacements during renovation. 3. I would support to incorporation in new building consents of tanks to hold grey water for non-drinking purposes, also in older houses where possible. Tanks work successfully in Melbourne so should work here. Cost could be mitigated by council if necessary. Tanks could be useful in the event of a major natural disaster.	Supports increased education on conservation and water wastage. Supports encouragement of the adoption of water efficient technologies and incorporation of greywater recycling as part of building consent process. Support use of restrictions during dry weather. Opposes water meters.

		4. I support water restrictions imposed for garden hoses, car washing, house washing in dry weather. I thank you for the opportunity to make this submission.	
81	Department of Conservation Wellington Email submission	Refer page: Appendix 1 / 38	Reference construction of storage dam as a last resort due to environmental costs. References effects of metering experienced in other municipalities.
82	Regional Public Health Wellington Email submission	Refer page: Appendix 1 / 41	References UN position on access to water as being a fundamental human right. Supports regulatory / enforcement approaches for water conservation. Cross references other efficiency programmes such as heating. References performance measures as proposed by Office of the Auditor-General
83	B Mitcalfe Kelburn Email submission	Refer page: Appendix 1 / 44	Supports education programmes and the encouragement of behaviour changing practices. References support for we based information portal and free plumber service. Opposed to construction of new dam.
84	GreenEarth Development Upper Hutt Email submission	Refer page: Appendix 1 / 45	References education programmes and initiatives such as green plumbing services. Also makes links between water conservation and emergency supplies. References community workshops to increase knowledge and awareness.
85	N Urlich Welligton Email submission	Refer page: Appendix 1 / 47	Supports construction of dam
86	R Averton Mount Victoria Email submission	Refer page: Appendix 1 / 48	Supports efficiency and conservation measures. Opposes construction of a dam. References restrictions being applied as a last resort. *Measures support listed at end of submission*
87	L Kininmonth Khandallah Email submission	Refer page: Appendix 1 / 50	Support rainwater harvesting.
88	P Winstanley Email submission	The draft for the water conservation and efficiency of water usage in the Wellington region in my opinion is outstanding. But I did notice that there was very little information on reducing water pressures [As you know] certain areas of Wellington do have high water pressure. If this pressure was	Supports pressure reduction to be used to reduce water consumption.

		reduced, the consumption would also be reduced and it would increase the life of the existing pipe network. To my knowledge Europe have done the same thing several years ago for the same reason to reduce water consumption. I understand there is a project looking at this at the moment and some area's like Roseneath have had their water pressure reduced. If this was expanded to the whole of the Wellington region, I think this could save a considerable amount of water and reduce the amount pipes that burst. I think it would be a good idea to include reducing water pressures in the draft as another option. [As you know] water meters would save more water in a sort term, but over time the water usage goes back to as it was before. This s only a suggestion and you probably have already investigated this issue, but I thought I would mention it anyway. I would appreciate your feedback on this suggestion. Cheers.	
89	AECOM Wellington Email submission	Refer page: Appendix 1 / 52	Provides technical knowledge of infrastructure and demand management as opposed to supporting any set initiative option. Provides a number of suggested steps in enhancing management of water supply activities.
90	A McLean Email submission	Refer page: Appendix 1 / 55	Supports rainwater reuse
91	R Davies Email submission	I just read the draft for the future of water. What are the current, and proposed provisions for individual households to collect and store rainwater, and to collect and store greywater? I have been looking on the Council website but have been unable to find out anything. Specifically I live in a rural property on the city fringe and would really like to store both rainwater which could be used for flushing toilets, washing clothes etc. and greywater which could be stored and uses for irrigation. If houses stored rainwater for irrigation, let alone toilets, this could make a difference – especially if such measures were built into new developments	References rainwater collection and re-use
92	Greater Wellington Regional Council Email submission	Refer page: Appendix 1 / 55	Reference general support for measures included in plan. Offers that pressure reduction could also be a worthwhile option for WCC to consider.
93	M Givon	Refer page: Appendix 1 / 93	Supports rainwater harvesting
94	F Cook Te Aro Email submission	Refer page: Appendix 1 / 94	Supports regulatory changes to enable water efficiency in buildings to be mandatory. Supports enhanced leak detection and repair. Supports 'free' plumbing service. Supports advice and information to be provided around rain water tanks and other water efficient technology. In general supports use of

			education, restrictions and more efficient technologies as primary tools. Underlying questions of any contribution to overall goal being achieved by metering.
95	C Davis Email submission	Refer page: Appendix 1 / 61	A technical and strategy driven submission based on several years experience managing water supplies for a variety of water supply authorities. Lists several options for demand management and also provides considerable information on strategies, issues and options rather than commenting on the documents put to the public for comment.
96	J Morrison Churton park Email submission	Refer page: Appendix 1 / 75	Generally supports options provided but stresses the cost/benefit return on the majority of options. Main focus on resilience being increased through GWRC's proposed dam option as well as the increased security in supply gained from this option.
97	S Hickling Mount Victoria Email submission	Refer page: Appendix 1 / 78	Supports public engagement and education.
98	M Payne Brooklyn Email submission	I would like to make an oral submission I would like to broadly support the demand side efficiency and conservation initiatives suggested in the proposed water conservation and efficiency plan. I am however disappointed at the complete lack of analysis given to the ecological impacts of Wellington City's water use within the Water Conservation and Efficiency plan. The Wellington region is currently diverting over 54 billion litres of water from the Hutt river and aquifers every year and discharging a large proportion of this as treated water directly into the coastal marine environment. The proposal to dam another high ecological value catchment at Whakatikei should be a concern with regard to the already degraded Hutt river catchment. I would also like to see a much stronger public education and engagement process in the wider issue of water conservation rather than just in relation to saving water during the dry summer months. If a sustainable "value" for water is to be created within the population of Wellington a year round campaign with appropriate resourcing would seem appropriate. To fund these demand side conservation and efficiency measures and public education programmes I would suggest that a "Water Conservation and Efficiency levy" be applied to all water supplied to industrial, commercial and domestic users on a	Generally supports conservation and efficiency approach as provided for in discussion documents. References a lack of assessment in area of ecological impacts in relation to Wellington's overall water use.

		volumetric basis. For consumers of large volumes of water the collected levy could be rebated for approved water efficiency or conservation projects. For un-metered users the levy could fund public education and demand side conservation and efficiency measures. Thank you for the opportunity to submit on this plan. I believe that this program could be an important step in making Wellington a more sustainable city to live in.	
99	Forest & Bird Society Wellington Email submission	Refer page: Appendix 1 / 79	Opposes construction of dam. Makes suggestion around the adoption of water sensitive urban design options (rainwater tanks, water efficient technology etc). Suggests knowledge / information sharing with other water authorities and Australia. Discusses stormwater management making links between rainwater tanks and improvements to stormwater quality.
100	P Norton Email submission	Water for Wellington - Some thoughts: • There is a widespread misconception that water is free, and that it should remain free. MY years of living in a rural area made me appreciate the cost of installing and maintaining my own water supply. • I favour the use of meter, if only for the purpose of enabling people to understand and monitor their own water consumption. • I do not necessarily support charging for water use. If however charging is considered, I would think about supporting a basic minimum free allocation, with a cost for consumption higher than that. • I strongly support the installation, and retrofitting if possible – of grey water systems for recycling household water for exterior use. There is no justification for using (expensive) treated potable for outside activities like washing cars, water gardens/lawns, and the like. • I strongly support the installation (including retrofitting) of water tanks, bladders, or other devices, for conserving rainwater. • I will be unable to make an oral submission.	Supports use of water meters as a management tool. Supports rainwater and greywater technologies. Generally opposes volumetric charging unless provisions made for a free allocation.
101	M Libeau Tawa WCC form	As an individual I believe we need to save our precious water. I am a great believer in having odd or even days for watering of gardens and lawns. I would also like to see some sort of free plumbing service to check for leaks and worn pipes and fittings, as I am sure lots of people waste water. I am renting and have done since moving back to Tawa (7 years) ago. I am very careful not to waste water. One last thing – good luck to Kerry Prendergast for Mayor.	Supports development of 'free' plumber service.
102	M Libeau Tawa WCC form	Gosh Wellington hopefully are more organized than Christchurch were, but I 'm sure we are. With good people like Mayor Prendergast and Mr John Morrison and Helene Richie on our City Council. If possible I would like to make an oral submission on "Water for Wellington" I think I have some good ideas.	References emergency preparedness.

103	S Norton Karori WCC form	Do a water meter trial – put zone meters into a cross section of suburbs – collect data for a year – then put domestic meters into these zones and monitor for a further year. Meter tariffs should have sub-normal rates for basic use and increasingly punitive rates for excess use. But should you adjust for no. of residents? (Tricky – ask Mrs Thatcher) At least set up metered sub-zones to allow regular zone checking. If you go for a dam option could it be raised in stages say 10-20 years apart to defer some costs? You don't mention earthquake issues – need secure storage near o city to minimise risks. I.e. invest more in secure service reservoirs.	References area meters and construction of dam incrementally.
104	B O'Shaughnessy Newtown WCC form	I full oral presentation will be made against the privatization of water.	
105	B O'Shaughnessy (CAT, HART, BAB, BAG, TIN DO) Newtown WCC form	• I oppose the privatization of water. • Water must be controlled by Council • No water meters • No increase in water rates • The present Mayor (KP) "confused" voters with her speeches and information	Submission speaks for itself.
106	D Fraser Kilbirnie WCC form / written submission	Refer page: Appendix 1 / 85	References in general conservation approach, use of restrictions and rainwater collection and reuse.
107	H Bathurst Miramar WCC form	Reducing water use should be first priority. All new buildings and those under-going significant alteration should be required to be water efficient. For existing buildings a 'free plumbing' service including leak detection and repair and worn washer replacement. Grants or subsidies for replacing toilets and showerheads, subsidies for those wishing to install rainwater tanks. Encouragement to use plants suited to Wellington climate and the Council to lead by example. If water restrictions needed – no car washing, house washing, garden hose restrictions. The only part of my garden I ever water is the vege patch and that not often. Water meters a last resort, but preferable to a dam. Avoid building a new dam especially one that will flood native forest. Us Kiwis need o develop a mind set of consuming water and using it more sustainably.	Supports grants or subsidies for introduction of water efficient technologies. References use of drought resilient plants. References meters as a last resort. Opposes construction of a dam.
108	M Juene Levin WCC form	I support providing measurement devices and self-assessment tools, providing free expert services and finding support such as grants and/or loans for the installation of new technology. I support partnerships with retailers and service providers to promote certain technologies or initiatives. I support the direct investment of council resources on specific initiatives or hardware e.g. leak detection and upgrades of community houses. I support efficiency measures such as front loader washing machines, dual flush toilets, rainwater collection systems, low flow shower heads and leak detection and repair. I support Council pursuing regulatory approaches to achieve water efficiency by proposing changes to the District Plan, requiring all new buildings to have rain water tanks. Council should also recommend that Central government reviews the Building Code to enable compulsory water efficiency measures.	Generally support options outlined for a conservation and efficiency approach with emphasis on measurement and assessment assistance in determining usage (no mention of meters however), water efficient technologies and rainwater tanks. References use of water restrictions.

		Water conservation measures should be used to manage significant drought events i.e. restrictions on watering gardens and washing cars. The purchase and planting of drought resistant plants and trees or native plants suited to the Wellington climate should be encouraged.	
109	F M C Lee Ngaio WCC form	1. I support aggressively reducing water consumption. 2. My comments below relate to household consumption. 3. I have been on a water meter since they were introduced in 1999 and paid for ine to be installed at a special price of $152 at a time when the street water mains were being renovated. (Presumably those with meters would **not** have to contribute to new installations through increased rates or other means.) I am not aware how many residents were given that choice but did not take it up. 4. Having a meter has been extremely helpful in curbing my water consumption, knowing that I would have to pay more, and having a deep respect for water conservation. For example I do not water the garden with a spray (with water falling on paths and unnecessary areas) but handhold the hose; I only have short showers; the lavatory has the 'two options' cistern; washing dishes is done as necessary rater than every time a dish is used, etc. 5. Another benefit of meters has been that since the meter was installed, twice a leak has occurred in the pipe between the road and my house. Both times a letter from WCC has alerted me to a sudden increase in water consumption. The firs time I noticed a damp patch and had a plumber repair the leak but the second time there was no surface damp showing and the leak had to be found and repaired. An overall reduction in Wellington's 'consumption' could easily result from the discovery of similar leaks or leaking tobies if everyone had meters. 6. I realize that low income / large family households could be seriously disadvantaged by the costs involved following meter installation. Some special financial provision would need to be considered and maybe combined with individual discussions to try to establish codes of behaviour to reduce consumption 7. I also favour the use of rainwater tanks where feasible to use greywater where suitable and more publicity generally, as well as help to low income families, about water efficient equipment. 8. Probably few people would react to just a request from WCC to reduce their use of water but a meter 'hits the pocket' and makes people think twice. It is vital that the 'message' gets across to all residents.	Supports meters with some provisos.
110	G Love Aro Valley WCC form	Refer page: Appendix 1 / 85	Provides options and information for household water management. References water conservation 'requirements' for new building and commercial users as being desirable.
111	S Love Aro Valley WCC form	Refer page: Appendix 1 / 87	Provides options and information for household water management. References water conservation 'requirements' for new building and commercial users as being desirable.

112	D Davis-Payne Thorndon WCC form	Of the options proposed I prefer to live with the vagaries of the weather and accept restrictions when necessary. Households should be encouraged to install collection tanks for rainwater and brown water to be utilized where the use of high quality reticulated water is unnecessary. The follow up option of another dam as and when the population growth makes it necessary. I am opposed to the installation of water meters in private dwellings as the considerable cost of installation and the ongoing cost of billing would be better spent by putting the money towards a future new dam. I do not believe that people are profligate with their use of water, and a negative effect of water meters would be that people on low incomes would restrict the use to a level where cleanliness is compromised, with the consequential impact on the public health system, children's education and the economy.	Support use of restrictions when necessary. Opposes water meters when same money could also go towards a dam.
113	P Kennedy Melrose WCC form	Over the years I have made a number of written submissions but feel tat these have fallen flat so therefore request an oral submission on this submission.	
114	P Arcus Oriental Bay WCC form	1. A clever imaginative education campaign which captures people's attention and which is on the internet as well as the print media (you may wish to engage an advertising agency). Also promoting garden plants which do not need so much watering 2. Regional neighbourhood meters to pinpoint particular areas of leaks and over usage. 3. A "flying plumber" service for people who are not able to change washers etc on leaking taps. This could be charged for at a reasonable rate or free to pensioners, beneficiaries etc. Commercial plumbers are too busy to come just to change a washer (I knew someone whose tap leaked for about * weeks who said this as their reason for letting this happen). 4. A register of people with garden sprinkler systems so that they can be specially informed when these are installed – I knew someone who used to put their' on every night! 5. Council garden staff not to set their sprinklers on in the middle of the afternoon! – I have seen this at times. I realize these measures would cost money but this amount would surely cost less that a new reservoir.	Support education and advertising of issue and solutions. References a plumbing service to assist non-commercial users. References council watering practices as needing attention.
115	J C Horne Northland WCC form	Page 19/20 Regulations for building efficiency measures 1. The Building Code should be amended to contain performance requirements for water use efficiency. This would enable WC to pass bylaws to require water efficiency measures, and water tanks in new buildings, and in renovated buildings. WCC should change the District Plan to reflect the change I recommend to the Building Code. (The final para on page 19 does not make sense.) I agree with the focus on efficiency measures. Page 20/21 – Wellington City Council 2. I support increasing the budget for leak detection and repair. I support the proposals for changes in community housing. P22 – Central Government I support the proposals for working with central government. P22 – Commerce and industry I support the proposals for working with commerce and industry.	References support for regulatory change via Building Code Support for increased leak detection and focus on efficiency measures.

		P23 – Residential I support the proposals for residential properties, including District Plan Change 72's amendment. The documents text is seriously lacking in hyphens in descriptors!!	
116	J Galloway Broadmeadows WCC form	I would like to see WCC pursuing the option of attempting to reduce demand for water by encouraging domestic rain water collection. Advantages for WCC of this option: 1. Householders would have a backup water supply in the event of a natural disaster or water main rupture interrupting the reticulated supply. 2. Assuming householders use water from their rainwater tanks for domestic purposes, there would be a reduction in runoff whenever it rains. 3. During dry periods should WCC water restrictions become necessary, householders would have an alternative source of water for gardens etc. Some incentives that WCC could offer to encourage voluntary installation of rain water tanks could include: 1. A reduced uniform water rate for homes with a rain water collection tank. 2. Make the rainwater collection tank a 'chattel' with a value added to its storage capacity to be added to the value of the house when setting a sale price (is there anything in the legislation that would prevent WCC from requiring real estate agents to do this?) If voluntary uptake of rainwater tanks proves to be insufficient then legislation to require it can be pursued at a later date (e.g. that outside taps in new homes can only be connected to a rainwater supply, not the reticulated one).	Supports rainwater collection and use of incentives to encourage rain water collection. Some methodologies suggested.
117	R Russell Kilbirnie WCC form	Would like the water brought back in house (the Council) and money spent to set up the new office. Only commercial connections to have water meters – not residential connection. Put money aside each year for the new dam – not a storage lake. New dam should have a pipeline to Kapiti Coast. In the summer months Wellington people go up to Kapiti Coast.	Support commercial metering. Opposes residential metering. References support for dam over additional storage lake
118	Anonymous Blank cut-out from Capital Times public notice advertisement (29/09/2010 – 05/10/2010)	I support a new regional dam.	Supports regional dam.
119	B Collins Aro Valley Written submission	Suggestions for water storage 1. Subsidy to ratepayers to help them purchase a rainwater barrel to capture roof run-off. It has a tap attached. Use: to water (or help) water gardens. 2. Two large reservoirs. With the amount of rain we have had over the last two seasons this must be a favourable option. 3. Some device to capture runoff from Wellington streets which become shallow rivers during heavy downpours. Examples: flash flood in Aro Street. I was standing in Aro Video Store and saw the water build up – further up the hill. In no time it was lapping the doorway of the video shop. Stormwater running down Durham Street a week or so ago. The speed of the flow and the quantity of water had	Supports use of subsidies to allow residents to purchase rainwater tanks. References stormwater capture.

		to be seen to be believed. Suggest investigate a way of capturing this. Drawbacks – it would need to be filtered and the cost, if a method of capture was invented, may outweigh the benefit.	
120	D Wilson Johnsonville WCC form and supplement	Refer page: Appendix 1 / 89	Introduces largely philosophical debate on addressing wider issues relating to globalization and energy demands. Originally lodged as LTCCP submission – makes no reference to water conservation or efficiency approaches beyond identifying that “there is a world wide water decline”.
121	Loyola Christian Life Organisation On-line submission	Refer page: Appendix 1 / 90	Opposed to water meters. References support for water conservation and efficiency based education programmes. References ‘greater control’ of commercial users with best practice assistance.
122	K Wheeler Karori WCC form	Having attended you Karori Library public meeting and read your discussion papers my ideas may strike you as somewhat simple minded however as the recent earthquake in Christchurch has shown the absence of clean running water creates an atmosphere of crisis for both domestic and commercial users. I therefore suggest that a greater number of concrete reservoirs be planned in addition to those already in existence. Expensive perhaps but safeguarding supply in times of crisis. Just as using smokeless fuel for home heating is water conservation could be initiated to save domestic and commercial users with the added incentive of financial rewards to encourage more rapid compliance to the latest technology or in assisting both domestic and commercial users to hasten the use of more efficient methods It should however be mentioned that the construction of the Whakatikei dam programme for the whole of the region can only be deferred for so long and it will take years to complete!!! There is No room for error.	References conservation and efficiency via incentivising uptake of such options. References resilience for natural disasters. References reservoirs over a dam but mentions timeframes needed for construction

Submission # 4

Sustainability Trust (online submission)

Sustainability Trust supports Council in its efforts to reduce water consumption and improve water efficiency. As a community organization working with households and individuals to lower environmental footprint, water conservation and consumption reduction has a host of benefits. We are especially keen to ensure that all options have been considered before construction of additional storage facilities such as a new dam. The Trust is keen to inform this plan and partner with Council especially in education, outreach, and in-home interventions.

We believe that the WCC water conservation programme should be promoted as a stand-alone brand to ensure penetration and consistent messaging. All interventions, education, and promotions should be linked to this brand with perhaps a clear target, rationale, and benefits for Wellington. A clear workplan, budget, and targets should be established and tracked for the duration of the programme. This would not obviate the use of pilot programmes to trial methodologies, but we encourage a central role for planning to ensure the best use of public dollars. We also encourage a robust steering committee be established to guide the process, with both expertise including project management and design, research and evaluation, tangata whenua, local government, relevant community organizations and engineering/technical consultants.

Due to the cost and social issues, we are unlikely to see water metering for residential homes in the near future. Voluntary reduction and efficiency in Wellington households will be require a range of interventions to achieve a measureable reduction in water consumption. It is likely that a range of media campaigns (in the Our Wellington page and other media channels) would raise awareness of the issue. However, we believe information alone may not lead to action and other more personalized advice will be needed to drive reduction.

In-home assessments and interventions:

An in-home assessment and report that highlights water reduction and efficiency gains would provide a personalized action plan for households. Personalised advice is much more likely to lead to action than broadcast information. Recommendations for low-flow shower heads, dual flush toilets, water barrels, etc, could be linked to suppliers, product discounts, incentives, and potentially a “green plumber” service.

Assessments could be subsidized and offered on first-come first-served basis over the summer months. It may also be wise to tie these assessments in with existing home visit programmes such as the WarmUp NZ home assessments, or the planned Energy Savers Programme being developed thru the WCC Climate Action Plan. A combined water and energy assessment is more likely to get uptake than water alone – especially as citizens are not currently directly being billed for excess water use.

The new Homestar assessment tool, covers water conservation and efficiency and would be an ideal tool to both assess and recommend options for reducing water use. Homestar is offered free online (simple version) or in-home with an expert advisor. Support and promotion of the Homestar tool would allow for a city-wide uptake and home assessment for all citizens. Tracking of uptake of conservation measures is also possible, thru the tool allowing WCC to track improvements across the city.

Citizens who improve their water footprint could also be profiled to create local champions and promote the water conservation message.

Workshops and Education

The Trust supports community-based workshops, fair stalls, etc to educate and inform the public in methods for reducing water use. Content and delivery would need to carefully planned and again may need to be linked to other messages (such as energy efficiency) to gain greater interest. Development of a workshop resource, tailored specifically for Wellington’s situation and that highlights the unique nature of Wellington’s water issues will be important. Linking of any public events with an in-home assessment will also be important to provide a practical and personalized path of action for participants.

The Enviroschools programme will likely provide another avenue for getting messages into the community. Again Wellington specific information and action linked to incentives will be important.

The Trust has delivered workshop and engagement programmes for a range of sustainability issues in the Wellington region. We are very interested in supporting development and delivery of public engagement events.

Rainwater tanks and resiliency

The Trust supports incentives to implement water tanks and rainwater barrels in residential, school, and community centres. Again, due to Wellington's perceived abundance of water it is unlikely that (unless regulated) that residents will widely install rainwater tanks purely for water conservation reasons and summer watering. Resilience (and using the Canterbury earthquake as an example) may need to be linked to encourage uptake. Combination of messages will continue to be very important.

Thank you for the opportunity to contribute.

Submission # 5

J Lenihan (online submission)

Congratulations for looking ahead on an issue that will undoubtedly arise in Wellington in the future. However, I think the Council is thinking too narrowly on potential options for reducing the amount of water that each Wellingtonian uses, as well as alternative sources.

Promoting conservation measures, public education, use of rainwater tanks and using grey water where clean water isn't essential all offer huge potential for reducing water demand and the considerable costs of new storage dams and installation of metres.

I oppose the installation of water metres and charging for water as there is no proof that these measures reduce water consumption.

New houses could easily be required to install rainwater collection and water storage systems to be used for toilet systems and gardening. There are many different measures available for the Council to encourage retro-fitting of similar systems for existing dwellings.

I believe the potential benefits of conservation measures and rainwater collection/storage should be investigated before any money is spent on investigating the options for increased storage dams.

There are also other potential sources of water available. On our street (Eden/Medway St, Island Bay) there are two springs that flow into the gutters all the year round. This water flows into the stormwater system and into the sea - and often carries large volumes of rubbish and oil etc from roads. This water could easily be diverted into a storage facility and connected to local houses for use on gardens. Some of the reticulation costs could be shared by the recipients of the water supply. I am sure there are many such springs/former streams that are no longer running through natural waterways but end up in stormwater pipes and transport pollutants into the sea. Water than runs down many of our valleys and through former landfills, thereby carrying pollutants into the sea, could also be diverted into small-scale storage facilities and made available for residential gardens - and for irrigating parks during the summer, which must be a considerable cost to the City each year.

I request that metres and charging be removed as an option in the near future, until other conservation and alternative options are capitalised. If these work then the need for expensive capital works could be delayed and possibly avoided altogether.

Thanks for the opportunity to have a say on this issue.

Submission # 14

J Macey (online submission)

Firstly congratulations on your lucid and informative documents about this important topic.

I encourage the Council to start 'small and soon' with measures rather than waiting till 2014 to start 'aggressive measures'. It's better to drip-drip-drip (so to speak!) information, advice and policy to people over time so the message sinks in and people's behaviour changes at a

fundamental level forever, not just temporary changes as with short-term restrictions on certain water use in dry summers, after which people revert to wasteful behaviour. I encourage you to start with school programmes to get kids to bring the awareness and behaviour into the home. Take kids on tours of the water system so they see for themselves what it entails.

I like the idea of rainwater tanks, greywater recycling etc but the Council is best able to distinguish the feel-good / look-good factor from what are truly effective and the most efficient measures. We rely on your research and coming out with the advice on what to do.

Sadly I think with conservation that most people behave selfishly and obliviously - I observed this in the winter power crisis when my granny who'd been through the Blitz would switch off her one-bar heater and go to bed to save power, while elsewhere other, younger members of my family would blithely say (with TV blaring unwatched in another room, lights & heaters on everywhere in the house), "I don't know what else I can do to save power"! So for most people the only language they understand is the $. If things get so bad I favour restricting people's use rather than increasing supply, because while yes indeed water is a taonga, necessity of life and all that, people treat it profligately as an infinite resource - washing their already-clean cars, watering their inappropriately short lawns at midday, taking endless showers, leaving the tap running while brushing their teeth, rinsing their dishes in fast-running (often hot!) water with the plug out, etc. (Again this is why w orking in schools would be useful -to set up good habits early.)

If need be I would go for metering (and I don't understand why this means water supply must be privatized). I absolutely endorse an efficiency campaign - front-loading machines, low-flow showerheads. It seems bananas that you can't make bylaws for this, if it requires legislative change in the Building Code that will take years then it seems wise to start lobbying right now! Awareness campaigns are a great idea and perhaps even incentives (again - what most people understand is what their wallet tells them).

With these broad principles stated, as far as the detail goes, it feels to me that with such a complex problem the Council is better able than opinionated but inexpert ratepayers to target its energy, and advise/require Wellingtonians to target theirs, at specific elements where the input of effort & money will result in best returns in water saved over the long term.

As an aside, I wonder whether the Council has researched water policy in countries where it's truly in short supply, e.g. Israel? While we are nowhere near their situation, it's possible some useful things might come out.

Best wishes.

Submission # 22

Wellington Residents' Coalition (online submission)

Submission of the Wellington Residents' Coalition on the Draft Water Efficiency and Conservation Plan

The Wellington Residents' Coalition was formed in 1997 to fight for the interests of Wellington residents.

We believe that:

- water is a human right and not a commodity to be traded for profit; and that,
- the public collection, treatment and supply of water for domestic use should be owned by and under the direct control of publicly-elected bodies.

The Wellington Residents' Coalition can assist the Council in its choice of options to ensure Wellington has sufficient water supply as it has some information on public preferences in the form of a petition of signatures it has collected from members of the public. Those that signed the petition are calling on their elected representatives in local, regional and national government to:

- Reject water metering as a method of domestic water management.
- Promote and subsidise alternative technologies that enable the collection and use of rainwater and grey water.
- Support publicly-controlled, not-for-profit management and conservation of our water resources.

The Wellington Residents' Coalition would like to present this petition at an oral submission on the Draft Water Efficiency and Conservation Plan.

Additionally, the Wellington Residents' Coalition would like to make the following points:

- When the Council develops programmes to assist individual and communal domiciles, e.g. subsidies for water tanks and filters to purify grey water, consideration should be given to those domiciles that may not be able to benefit, e.g. if there is not enough space to install a water tank.
- The Council could benefit from taking a detailed look at the habits of the city and business. For example, Taylor Preston Ltd, the meatworks at Ngauranga, might be able to make use of better or reconfigured technology and processes to minimise water use and the Council might be able to help them with this.
- A replacement option to building a dam is a storage reservoir. This would be a cheaper option and the reservoir could be used and then phased out when efficiency measures have been put in place and are working. This option would give less capacity, however, this may not matter as water consumption has been reducing for five years in a row, both on an individual basis and regionally.

Submission # 27

P Dempster (online submission)

Water has become an important issue and its supply cannot be taken for granted. We feel that this issue should be tackled by steps to reduce demand, better using what resources we already have and enforcing restrictions in times of drought. The option of increasing supply is too costly for the environment and the ratepayer. There would need to be an united approach from central government, regional and city councils.

The council needs to focus on replacing aging infrastructure. Last year the 50 year old water main in Lambton Quay burst leaving businesses without water for a day. In Dunedin, the city council set the example by replacing a large amount of the water mains as a priority. In Wellington there is over 1000km of reticulation which are being replaced at less than 10km a year. This should be given a higher priority as the amount of leaked water represents a substantial amount in money and as a resource.

One way to reduce demand would be to promote greywater reticulation and recycling. Tauranga city use grey water from a treatment plant to water playing fields. In Kapiti, consent for a new build includes rainwater or grey water recycling. Further examples have been set by recent government buildings that incorporate rainwater harvesting and grey water systems to flush toilets etc. The council could give subsidies to encourage use of water efficient fixtures and appliances, e.g. front loading washing machines.

We agree with the decision not to waste money on water meters. Climate change has shown water shortages to be a usual event and we support hose bans with on the spot fines. There would need to be an education programme to promote awareness of this precious resource. The council could model drought resistant planting by creating show gardens in Wellington as part of public space.

We do not support the building of a dam and feel we should look for creative ways to use the water we already collect in smarter ways. In conclusion the WCC has a current debt of $280 million and is about to inherit the leaky house costs. The cost of a $70 million dam would be impossible to justify to ratepayers without showing all the ways to be absolutely positive about the existing supply first.

Submission # 31

Enviro-tech (online submission)

In your water discussion document - A Draft Water Efficiency and Conservation Plan you talk about partnerships with retailers and service providers to promote certain technologies and incentives.

As a business that specialises in innovative water saving products predominantly for commercial bathrooms we believe we can benefit the council in this regard.

Enviro-Tech has identified that often cost is the determining factor whether these types of products are used and set about introducing ranges of products that can reasonably be retro-fitted and that more importantly can be an affordable option. We wish to help improve education to businesses and schools of the advantages that certain products can offer in saving water both in supply and disposal of waste water. The reality is that with businesses that do pay for their water, installing these products will mean the products end up paying for themselves in a short amount of time.

Enviro-Tech 6 Star WELS rated sensor taps save up to 80% water and associated power costs where hot water is used.

Up until now mainly because of the cost they have only been considered in up market and big budget projects, but we believe the benefits are so great that in line with countries overseas, sensor taps need to be viewed as an essential everyday water saving device for ALL shared bathrooms, we offer functional designs to enable this objective. When the cost is reasonable sensor taps can become an option for all businesses, bars, restaurants, offices, factories, retail outlets, malls, gyms, schools and kindergartens. The list is endless once cost is taken out of the equation.

Enviro-Tech does also stock a range of time delay taps suitable for offices, hotels, these designs are for a more stylish finish and not your typical 'public toilet design push tap'. This gives businesses and organisations options when choosing water saving tap-ware.

Enviro-Tech 6 star water rated urinal sensors offer maximum water savings for lowest cost, these urinal sensors can be plumbed to any existing urinal saving the cost of replacing urinal pans. Because they are fitted to each urinal they ensure that only the urinal used is flushed but it is flushed every time also improving hygiene. This cost effective method of installing urinals flush systems means they can be considered in places where they might not automatically be thought of; because installing one or two urinals is too expensive. But when the alternative is another toilet stall a cost effective urinal option becomes the cheaper option and the extra toilet stalls becomes the greater cost. This equation results in maximum savings in costs and water from flushing toilets unnecessarily.

Sensor Toilet flush valves offer the same benefits water saving, hygiene promoting, and ideal solution mainly in new build situations.

Enviro-Tech can offer education, sponsorship and substantial discounted offers to council identified businesses, schools and council projects.

We have worked with many schools to show how leading 'green' bathroom technologies can work out similarly priced to other products that may be being considered. This has been of real benefit to schools promoting the sustainability message to their pupils with hands on experience everyday to these products. With several schools that have requested it we have spoken to children, provided educational literature and information for school projects on water conservations. This is an idea we could further expand in conjunction with council run holiday programs, this could be explored further in product supplied at cost to allow the children in these programs to explore in a fun way products that help save water that they themselves can see and touch and use.

Enviro-Tech is New Zealand owned and operated, locally run company with a mission of providing other businesses realistic solutions to water conservation and improving public hygiene; solutions that are affordable and adaptable.

All products are independently laboratory tested to AS/NZS standards, 6 stars WELS rating. Further certification is currently underway to achieve Australian Watermark with a view to marketing the Enviro-Tech range in Australia February 2011.

In conclusion we would like to explore ways that our company can work with the Wellington Regional Council to be of benefit to your water conservation message. Enviro-Tech realizes that more far reaching initiatives are also needed to address the issue completely, but feel that we can be benefit the cause with access to affordable products and in many cases companies may just need to be made aware that there are viable options; options that turn real savings into long term cost cutting.

Submission # 38

K Glassey (online submission)

I agree that extra capacity is needed and inevitable but there are many things that can be done to delay when it is needed. New Zealand and Wellington need to live a more sustainable lifestyle; it is only our low population density and regular rainfall that has allowed our excessive water use to continue. Climate change will exacerbate the deficit in water. I submit (not in any particular order) the following as measures that would be useful to reduce our water usage:

1. All new and renovated residential and commercial buildings should be required to fit low flow water fittings. If the Building Code needs to be changed then it should be amended asap.
2. All outside taps should have timers fitted with a maximum of 1hr allowable. Most sprinklers are let on far too long.
3. Commercial buildings should have rainwater capture systems for toilets use.
4. Get rid of timed flushing toilet urinals.
5. Subsidise replacement low flow shower heads & toilets etc.
6. Free water efficiency checks and rating with advice on how to reduce use. A high efficiency could mean lower water rates.
7. Use storm water capture for council garden irrigation.
8. Free leak checks and repairs.
9. Use the current water mains system to generate electricity to power pumps etc. The gravity pressure from high placed reservoir tanks must be able to be utilized without compromising water pressure in Wellington! This will help pay for another dam.
10. The storm water system in Wellington must also be able to be used for electricity generation with the height of the drop from many of the suburbs. This will help pay for another dam.
11. The Wellington water system is very exposed to an earthquake and we would take longer to recover than Christchurch. This risk needs to be reduced.
12. When needed ban sprinklers early in the summer season.
13. Encourage and provide incentives for the installation of grey water and roof capture water tanks.

Submission # 48

Appropriate Technology for Living Association (online submission)

I would like to outline the benefits of rainwater collection tanks for supplementation of water, emergency supplies, and catching some of the first flush after a heavy downpour, thus lessening impact on storm water system. Please contact me to arrange a time for an oral submission

There are a number of papers that are part of this submission:

1. Analysis of the Performance of Rainwater Tanks in Australian Capital Cities 1) Peter J Coombes and 2) George Kuczera 1) Post Doctoral Fellow, School of Engineering, University of Newcastle, Callaghan NSW 2308 2) Associate Professor, School of Engineering, University of Newcastle, Callaghan NSW 2308

   Abstract:

   The performance of 1kL to 10 kL rainwater tanks with mains water tickle topup used to supplement mains water supply for domestic toilet, laundry, hot water and outdoor uses was evaluated for Brisbane, Sydney, Melbourne and Adelaide. The PURRS (Probabilistic Urban Rainwater and wastewater Reuse Simulator) model developed by Coombes and Kuczera (2001) was employed to continuously simulate the performance of rainwater tanks using synthetic pluviograph rainfall generated by the DRIP (Disaggregated Rectangular Intensity Pulse) event based rainfall model by Heneker et al. (2001). Depending on roof area and number of occupants in a household, the use of rainwater tanks resulted in annual mains water savings ranging from 18 kL to 55 kL for 1 kL rainwater tanks to 25 kL to 144

kL for 10 kL rainwaters tanks. The average retention volumes available in rainwater tanks prior to storm events ranged from 0.26 m3 to 0.71 m3 for 1 kL tanks to 2.34 m3 to 8.4 m3 for 10 kL tanks.

2. The relative efficiency of water supply catchments and rainwater tanks in cities subject to variable climate and the potential for climate change *

   PJ Coombes (Bonacci Water), Melbourne, Victoria School of Chemical and Biomolecular Engineering, Melbourne University, Victoria School of Environment and Life Sciences, University of Newcastle, NSW ME Barry BMT WBM, Brisbane, Queensland

   Summary: This study has analysed the relative efficiencies of runoff into dams supplying Brisbane, Melbourne, Perth and Sydney, and of rainwater harvesting in those cities. It is shown that both respond differently to drought and climate change forcing, with decentralised rainwater harvesting systems in cities exhibiting a more uniform performance across these stressors. The impact of natural variations in climate is considerable, with the inland catchments that supply cities exhibiting a disproportionate decrease in yield in response to rainfall reductions, as compared to rainwater tanks in the cities. A 50% decrease in median rainfall at each location results in a 60% to 85% reduction in runoff to dams and a 15% to 30% reduction in yield from 3 kL rainwater tanks. Rainwater yields from 3 kL tanks in the cities were more resilient to the potential for climate change than runoff into dams supplying the cities. Reductions in runoff from the worst case climate change scenario ranged from 19% to 53%, while reductions in yields from rainwater tanks were 5% to 8%. Yields from rainwater tanks in cities were also more resilient to droughts than runoff into dams. This study highlights the potential for rainwater tanks in cities to supplement water supply from dams during droughts and to buffer the expected impacts of climate change.

3. Estimating the Cost-Benefits of Rainwater tanks - Stan Abbot, Director, Roof Water Research Centre, Massey University Wellington

Submission # 50

R Weinkove (online submission)

The goal is to reduce consumption, improve security of supply, and to avoid excessive rates rises. I do not think that 'education' will have any significant long-term impact: The only way to reduce consumption is to meter and charge by water volume used. Once they pay for water by volume, they will find their own ways to reduce consumption (e.g. collecting rainwater, fixing leaks, avoiding sprinklers). The following process is fair, and will achieve all the goals of the water plan:

Short term:

1. Introduce 'voluntary' water meters, which households can buy for themselves at a reasonable cost (e.g. less then $1000 including installation - subsidise the meters if necessary). Households with a water meter will then pay for their water by the cubic meter*.
2. Introduce an 'unlimited water' supplement to the rates bill. Any household without a water meter has to pay this rates supplement. The cost of this supplement should be based on the CV of the property (easily calculated), so poorer households would be less disadvantaged.

The 'unlimited water' supplement and cubic meter charge will be structured so that purchasing a water meter is financially attractive for most households (i.e. they will save money over a timescale of e.g. 5-7 years). The result will be a steady uptake of water meters in Wellington, and a consequent reduction in water use. Over time, the cost of installing a water meter can be gradually reduced (by raising the subsidy if necessary) to steadily increase the uptake of metering. Eventually, metering will become compulsory.

Long term:

- Planning for the Whakatikei dam must proceed. With or without water metering, the dam is critical for the long-term viability of Wellington as a city, and will have a vital 'post-earthquake' function. It is inevitable that there will be numerous delays due to

planning, environmental and construction problems. This makes it essential that planning for the project (consultations, land purchases etc) start as soon as possible.

- The dam will be paid for through metered water charges and the 'unlimited water' rate supplements collected. If necessary, water rates can be increased over time to pay for the dam. An increase in water charges will be more palatable by then, as metered households can elect to reduce their consumption to lower their water bills.

* for rental properties, metered water bills will be paid by the tenant, not by the landlord. This is logical, as the tenant is the consumer, and the tenant must be incentivised to conserve water. An additional benefit of this system is that landlords will have a strong incentive to install water meters in order to remove the 'unlimited water' supplement from their rates bill.

Submission # 58

I Butler (online submission)

The medium-term focus for I support the introduction of water metering (option 3), with a few caveats.

Metering is the only effective way of ensuring medium- to long-term changes in Wellingtonian's water use.

Increasing the severity and frequency of restrictions (option 1) develops community tensions between those who choose to work with the restrictions and those that don't, as seen in Queensland with the shooting of an elderly man in mistaken dispute over water restrictions[2].

Water restrictions without a massive enforcement effort will be voluntary only.

Developing further storage infrastructure (option 2) is the worst of all worlds, requiring massive expenditure on the part of ratepayers, but doing nothing to modify water use patterns in the city and address the long term sustainability of Wellington's water supply.

It also makes no sense to invest millions in up-stream infrastructure when Wellington's downstream infrastructure is in such poor condition. In the hill suburbs, it is not hard to find tell-tale trickling streams over footpaths and down banks where a pipe has been allowed to leak for years, even decades.

Metering is needed to dispel the myths that fresh water supplies are free and are an unlimited right of Wellington residents.

In one of the wettest Wellington winters I can recall, my neighbours have kept an automated sprinkler system at work daily watering their driveway plantings. Metering is the only one of the three options that addresses wasteful and easily addressed water use practices by residents.

Metering will also act as an incentive to homeowners to fix faulty fixtures and/or replace broken water infrastructure on their properties. In cases where the cost of this work is very high, council assistance should be available in recognition of the public good in doing such repairs.

Metering will impose an unfair or disproportionate costs on tenants on low incomes (who don't pay rates and therefore don't currently pay directly for water), and they need to be given some relief from the costs of metering.

I also think the council should offer incentives to homeowners to install rainwater butts and other water-saving measures.

Submission # 72

A Bowman (online submission)

The installation of water meters and volumetric charging for water consumption is the only long-term solution to Wellington's water shortages which provides both an equitable and

[2] In November 2007 Sydney man Ken Proctor (aged 66) died of a heart attack after being assaulted during a dispute about water restrictions and the use of a garden hose. Although Mr Proctor was complying with the restrictions (hand held hoses were allowed) he was assaulted after turning his hose on a 38 year old male during the altercation which led to him being assaulted.

sustainable solution. Cities in New Zealand which have installed water meters and which charge volumetrically for water consumed have considerably lower daily per capita consumption rates than cities like Wellington, which do not charge volumetrically. Tauranga City has been able to defer major water supply expansion projects by a decade thanks to water meters. Water consumption in Auckland City is significantly lower per capita than Wellington - which can largely be attributed to the use of volumetric charging.

As is rightly pointed out in the consultation material, conversation measures do not have on-going benefits because they rely on people voluntarily changing their behaviour. People will not voluntarily change their behaviour unless they have ongoing incentives or costs. Charging for water volumetrically would provide this incentive as people, such as elderly people living alone, would use far less water than families. Consequently, people who choose to or are able to use less water would benefit.

Efficiency measures will have some benefit and those that can be advanced at minimal cost to the ratepayer should be advanced. Nevertheless, if water consumption was charged for by volume, each individual would have an incentive to undertake their own efficiency improvement actions, because they would benefit from a decreased water bill.

Construction of a new storage dam is likely to be necessary in the future as Wellington's population grows. However, this will only provide any relief from supply constraints as long as the supply exceeds the demand from the growing population. If demand mechanisms are not put in place, this excess supply of water will quickly be used up and Wellington City will be facing the same problem it it now. Extra water supply does not solve the problem of excess water demand. Every year that Wellington city can delay the construction of a new storage dam the city will save the interest costs of the borrowing required to fund the construction of the dam. This will be a significant sum that ratepayers are not forced to come up with each year - in effect subsidising those people who use water wastefully. As is also pointed out, the use-value, and environmental benefits from the area that will need to be flooded in order to construct a dam should not be forgotten. The implications for river flow, native fish habitat and Maori concerns about implications for the mauri of the river affected all must be factored into the cost benefit evaluation.

Water meters and volumetric charging are an equitable and sustainable approach to reducing demand for water - an extremely precious resource. Under the current approach to charging for water, low income families and elderly people on fixed incomes, for example, are subsidising large rich families and people with swimming pools or extensive gardens through their rates, because people who choose to use lots of water do not pay more than those who choose not to use lots of water. This is completely inequitable. While social concerns must be considered once water is charged for volumetrically, this is not a reason not to start charging by volume, merely a reason to consider the implications and ensure that people who are genuinely in hardship are able to afford to purchase water.

Rules around the banning of activities such as washing cars or washing houses will not be effective. Such rules require high levels of expensive enforcement action so are not cost effective. If they are not actively enforced, they will have no effect. Furthermore, many products used to build houses (Colorsteel, for example) require periodic washing to maintain the product's warranty. It would be unwise to prevent home owners from maintaining their houses in this regard. Installing water meters and volumetric charging would ensure that people had an incentive to behave in as water-efficient a manner as possible. Imposing stricter rules around water gardens and other non-essential water use will also only have limited effect as they are difficult to enforce - so people will flout the rules.

The sooner that water meters and volumetric charging are imposed, the sooner Wellington City residents can start benefitting from enhanced water efficiency and lower water bills for those prepared to put in the effort.

Submission # 78

M Taylor (emailed submission)

Dear Councillors (?),

I make my submission below on this draft plan as a Wellington resident and ratepayer of

nearly thirty years. It is based on the brochure, the discussion document and the draft plan from the wcc.govt.nz website and attendance at one of the public meetings. In my submission I refer to those as “the Brochure”, “the Document”, “the Plan” and “the Meeting” respectively and to all as “the Information”. I wish to be heard in support of my submission and ask to be contacted (Tel 3898071) so that can be arranged.

Questions from the Brochure

(a) Reducing water use: What are your thoughts on the proposed measures [the Brochure]? The Brochure has no clear list of “the proposed measures”, indeed the only item specifically identified as a “measure” is on page 5, “Meters [implies residential] and water bills”. I oppose a consumption based water rate generally being compulsory for residential properties. I find it hard to believe that provision of water meters to all residential properties would not lead to a consumption based water rate, so I would not support that step either.

Nevertheless, it should be a requirement for all properties with pools, including spa pools (above some minimum capacity) to have a water meter and pay a a consumption based water rate I understand that a change in the organisation of the WCC regulations opened a loop hole in a previous requirement for that and, as I received conflicting information a the Meeting, it is unclear to me whether that loophole has yet been blocked. It certainly should be. The requirement for metering and a consumption based water rate should be extended to all those properties that have automated watering systems (unless they are fully independent of the reticulated water system). Enforcement is not significantly harder than enforcing compulsory water restrictions. Provided the penalty is high enough property owners won't wait to get caught.

I do strongly support the council continuing to allow residents to purchase water meters and having the option to pay a consumption based water rate. When council first made them available I bought one for my property. The knowledge that provides has, together with various actions/inactions, enabled me to reduce my consumption significantly. That option encourages conservation and efficiency and to increase its take up the system needs to be modified:

(1) The resident should be charged the lower of the consumption based water rate and the valuation based water rate. That could be done by charging on the latter basis during the year and providing a refund, if applicable, at the end of the year. That still provides the incentive and information that leads to reduced consumption but removes a risk which is too great for many to take.

(2) To encourage conservation and efficiency there should be no fixed charge, just a per cubic meter charge. The quarterly meter reading charge of $27 is outrageous and I am unable to find Capacity's justification for it (I have searched their annual report “192_CAP_FULL_Annual_Report-WEB 2010-2011” and Statement of Intent 2010-2011).

(3) Capacity need read the meter only at the year end and in that case the charge should be reduced to 25%. If my (1) is adopted then there need be no further provision. If not, the first three quarters' charges could be based on the resident's readings, which could be subject to some check for reasonableness against previous consumption patterns, or an estimate.

(4) A progressive pricing system should be used for those paying on a consumption based rate. That would encourage conservation and efficiency. The current system with its high fixed charge does the opposite. I could reduce my actual cost per cubic meter to less than a third by using four times as much water as I currently do!

(5) The website should include an easily found application form (e.g. as a link from http://www.wellington.govt.nz/services/watersupply/watermeters/watermeters.html)

(b) Reducing water use: What are your thoughts on the proposed measures [the Plan]? My comments are based on Annex 1. The priority settings seem appropriate.

(1) Hardware measures

Most of these measures should be made compulsory for new, or when substantially renovating, properties and central government should set those requirements in place. Council should put pressure on it to take the necessary steps including: prohibit the sale of (new) single flush toilets; phase out production and importation of top loading washing machines; prohibit future fitting of non leak resilient taps / water fittings. If central government doesn't take action, then requiring most items (e.g. dual flush, low flow heads, leak resilient

fittings, waterless urinals) together with rain water collection (noting the benefit varies around the country) for new/substantially renovated properties is WCC's responsibility.

Low flow shower heads increase efficiency for one particular use. Aerator taps are also available and similarly break the water flow into fine droplets producing an air-water mix which provides the same wetting effectiveness with a lower flow. They can provide substantial savings (50%) and should also be included as a high priority measure.

(2) Other measures

I also support these. As they are not major items and do not require regulation it is reasonable for WCC to do them itself, doubtless benefiting from other region's experience where that's available.

(c) Compulsory Restrictions: What activities should be restricted in such cases?

These prohibitions and restrictions should apply only to water from the reticulated system Prohibit use of any sprinkler (except fire) or automated watering systems.

Prohibit washing of buildings (external surfaces)

Prohibit (re)filling of pools

Prohibit washing of vehicles

Prohibit use of hoses except for hand hose watering of plants with a sliding scale of restrictions on use of hand held hoses for watering plants: allow start dusk to end dawn; restrict to every other “night”; prohibit for all but vegetables; full prohibition – one can always use a watering can.

Where any such use is necessary for a commercial operation a substantially (many times) higher (and progressive) cubic metre charge should be imposed. A limit based on a percentage of “normal” use could additionally be applied, but that could encourage the unscrupulous to increase their “normal” use unnecessarily as a form of “insurance”.

(d) Compulsory Restrictions: How often do you think these restrictions should occur?

As well as the frequency of the occurrence of an event its duration is also important. Reasonable values vary according to the particular item. The values I suggest are inclusive (i.e. a one month duration event counts toward both the one week (as 1 not 4) and one month frequencies). I'd be happy for any of my listed items to be imposed on average once a year provided the duration was not more than one week. Noting watering can use would not be restricted, I'd be happy on average with any of those lasting up to a month every three years, two months every five years and three months every ten years.

(e) Compulsory Restrictions: If restrictions are put in place, what should the Council do to encourage residents to adhere to them?

Encouragement is appropriate for voluntary restrictions. For compulsory restrictions the question should relate to enforcement. While it is impractical to expect to catch everyone, if the penalties are significant enough that should be a deterrent. An important part of the penalty and discouragement would be “naming and shaming”.

General: do you have any other comments

(f) I strongly support conservation, that is avoiding unnecessary and inappropriate use, of water. The Information needs to distinguish more clearly between demand and need. For example at the extreme end I have observed people “hosing down” areas simply to move on leaves and loose dirt, and leaving hoses running into gutters while they do something else; obviously such (ab)uses are not needed but doubtless are included in assessing “demand”.

(g) Similarly I strongly support efficiency in any necessary use of water as for any natural resource.

(h) This consultation is to produce a conservation & efficiency plan, not to justify expansion.

The Plan and Brochure titles and so the consultation relate only to the plan necessary to achieve conservation and efficiency. Lack of response, or even opposition, to the Plan cannot be taken as support, and certainly not a justification or a mandate, for increasing supply. It is good that threats from that (additional dam(s), reservoir(s) etc) are identified in the information for consultation, but some detail should be out of scope for the finalised Plan (e.g. Annex 2) . I also note there is some risk that the wording of the Information might be taken to be offering “increase supply” as part of the Plan (e.g. the Brochure page 2 notes “three main choices”).

Clearly “increase supply” cannot be part of a Conservation and Efficiency Plan; it is related but not the issue of this consultation.

Before making any move in that direction, which, for example, might end up being proposed if the Plan is not strong enough, a separate specific consultation would be needed to justify, or not, that.

For that reason (i.e. it would be out of scope) I have deliberately not commented on “increase supply” options or details mentioned in the Information.

(i) Wellington City Council must perform the consultation themselves

I appended “(?)” to my salutation as it is not clear that this consultation is actually by Wellington City Council. I am concerned at the way the consultation process has been organised and am left wondering about the role of “Capacity” in this. The website (http://www.wellington.govt.nz/haveyoursay/publicinput/2010-10-draftwater.html) says “**Wellington City Council** would like your views on the draft Water Conservation and Efficiency Plan”. The brochure page 2 says “**the Council** wants your views on how this should be done.”. The brochure page 6 says at public meetings “**City Council staff** will present the plan’s outline”. The Document says “To give **the Council** your suggestions please ...” The online submission form (http://www.wellington.govt.nz/haveyoursay/publicinput/2010-10-draftwater.php) states “All information collected will be held by the **Wellington City Council**, 101 Wakefield Street, Wellington”. Yet submissions have to be emailed to the CCTO, “Capacity”, which is actually registered as a limit liability company “Capacity Infrastructure Services Ltd” (1337122). Furthermore its employees, not City Council Staff, presented the Plan at the public meeting – although they didn't really admit that until challenged.

Submission # 79

Wellington Employers’ Chamber of Commerce (email submission)

Introduction

The Wellington Employers’ Chamber of Commerce (the Chamber) has membership of 1,600 businesses in Wellington City. It works closely with other chambers in the region and is part of the Employers’ Chamber of Commerce (Central)[3]. While most of our members are in the small to medium enterprise category we also have as members 15 of the largest 20 companies in New Zealand.

The Chamber advocates policies that reflect the interests of the region’s business community and the development of the Wellington economy as a whole.

The Chamber is grateful for the opportunity to make this submission on Wellington City Council’s discussion document, Water Supply and Demand in Wellington - A Draft Conservation and Efficiency Plan (the Discussion Document).

General Comment

Wellington businesses have a strong interest in Wellington City Council operating an efficient water management system. Not only do businesses consume 26% of the water consumed in Wellington City, they also pay a disproportionate amount of the cost of managing overall water supply through the rates they pay[4].

Even more importantly, water is a scarce resource and so good management is crucial for the economic performance of Wellington.

We accept the prognosis as set out in the Discussion Document that without a significant change in the way Wellington’s water is managed shortages are likely.

The document has raised a number of potential solutions including:

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[3] The Employers’ Chamber of Commerce Central was created out of the merger between the Wellington Regional Chamber of Commerce and the Employers and Manufacturers Association (Central) on 1 July 2010.

[4] In 2010/11, council is expected to receive $13.5 million from commercial, industrial and business users – 40% of the total.

- Augment supply by way of a dam
- Reduce demand by way of water meters
- Reduce demand by way of leak reparation, regulation and other "tools"

As discussed below, we believe a combination of measures is needed rather than one single measure in isolation.

We also believe there is potential for some considerable reform of the way that the region manages its water – beyond the scope of the issues raised in the discussion document. We favour the management of water along commercial lines (recognising there are social considerations to be taken account of) and we believe there is potential for further regional integration. As water becomes increasingly scarce, the need for more significant reforms will be greater.

Water Storage

The Discussion Document has a clear preference for reducing water consumption rather than augmenting supply.

While the Chamber accepts there is plenty of scope to reduce water demand and waste before going to the expense of building a new dam or storage lake[5], we think it is inevitable that due to likely population and economic growth (which is desirable for Wellington) increased supply will be necessary.

In 2009 Wellington City Council adopted an interim goal: "To accommodate Wellington city's population growth through to 2025 with the same amount of water we have available to us now."

This essentially means that per capita consumption has to decrease by more than 15% over the next 15 years based on population growth projections. This is not unachievable. There is much potential for significant reductions in per capita demand particularly as council's leak detection and reparation activities continue. However we are concerned that such reductions can not be sustained longer term once the low hanging fruit is picked.

The rates of population, tourism and economic growth projected for Wellington mean that per capita consumption would have to continue to decrease sharply after 2025 to prevent total consumption from returning to a strong growth path. Over the next couple of decades a significant increase in total consumption is likely.

The document points out there are considerable savings to be made from delaying the building of a dam until it is certain it is needed. We acknowledge this but recommend that consideration be given to the need to increase storage capacity at an early stage as the stakes are high and the costs significant if construction is left too late.

Importantly, if the city (and the region) is to attract new business adequate water supply is necessary. If a large business operating in a water-intensive industry wanted to establish itself here, adequate storage capacity may be the difference between setting up and not setting up. The projected demand for water does not seem to allow for the possibility of this.

It is also important to note that Wellington currently has a relatively low security of supply standard – there is sufficient water supply to cope with a one in 26 year drought. The council's interim goal to 2025 would improve this standard to cope with a one in 50 year drought but, as discussed this would be hard to sustain beyond 2025. Auckland, on the other hand, has a one in 200 year standard.

Water Meters

In Wellington businesses pay volumetric charges for water but households are not metered and instead pay a charge not related to consumption. Many councils around the country do apply water meters to households but not Wellington.

At the very least, water meters have a benefit in that they provide information as to how much water people are consuming. Currently there is no information for most households.

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[5] We note Greater Wellington Regional Council says a new storage lake is preferable and cheaper than a new dam ($80 million compared with $140 million). It is also faster to consent and build.

Going a step further and replacing the existing water rates with charges for water based on metered usage (a consumption unit charge) would provide consumers with a real incentive to reduce consumption.

There is likely to be opposition to water pricing but this is mainly because there is a lack of awareness that it is already being paid for. Some households would pay the same as they do now, higher–use households would tend to pay more and vice versa but the point is if water was charged for according to use it would give households an incentive to save money by reducing consumption which would benefit them financially as well as reduce the city's water usage.

This is the experience around the country with councils that have adopted water meters. For example, Nelson City reported a 37% reduction in peak summer demand when it introduced volumetric charging.

We acknowledge there are social implications in charging for water but submit that these can be addressed by council mechanisms. It is important to note that under a charging regime there is potential for all consumers to save money through reduced consumption.

The Discussion Document concludes that the cost of installation and maintenance is a significant barrier to the introduction of water meters. However, the $50 per household per year or $625 lump sum cost of installation is much cheaper than most of the proposed efficiency measures (for example front loading washing machines, leak resistant taps, rain water tanks etc as listed in annex 1). We acknowledge the installation cost is an issue and would hope that if a decision were made to adopt water meters savings could be found.

Disappointingly, the Discussion Document does not provide estimates of the benefits from the savings that could be made from the installation of water meters and the consumption charging of water. Without this information it is not possible to make proper comparisons with the other options

We recommend the council looks more closely at the water meter option.

Other 'tools' to reduce water use

We agree that efficiency measures (reduced water consumption by the same level of activity) are generally preferable to conservation measures (reduced activity). However, as discussed above, we think water pricing would give consumers a choice i.e. some people would be happy to reduce activity (conserve) in order to save money as well as look for efficiency gains.

Generally we oppose regulating for efficiency measures and think that, as with other areas of environmental public policy (e.g. climate change) a price based mechanism is preferable. We recognise that in emergency situations bans and restrictions may be necessary but we think using market mechanisms such as volumetric charging is a much better alternative to regulations.

We acknowledge that many of the "tools" listed on page 18 are pragmatic solutions and are happy to consider them on a case-by-case basis but in general we are reluctant to support compulsion or undue council involvement / spending to implement these tools. For example we do not think the council has a role in providing grants and subsidies for residents or businesses to adopt new technology (shower heads for example).

In principle, we support the proposed provision of information and education as well as of measurement devices and assessment tools but how these are paid for is an issue (fully charged, partly charged or out of rates). Care needs to be taken so that activities undertaken by central government, regional government and local government are coordinated to avoid duplication. There might also be a role for councils across the country to coordinate information campaigns rather than different councils replicating the same service. For example, a single nation-wide, web-based portal might be more cost effective than one operated by WCC on its own.

Each of the tools discussed in the document are expensive especially in aggregate and the cost will ultimately be borne by ratepayers (largely business ratepayers). Again we remain unconvinced that water meters are not the best solution and think the installation cost argument is overstated when compared with the cost of these alternatives.

Education campaigns would be far more effective if water was to be charged for as without charging, even with raised awareness, only a proportion of the population will feel morally obliged to save water.

'Non-revenue water', which makes up 15% of Wellington's water consumption, is largely water that is leaked or lost through unauthorised consumption. Notwithstanding recent savings, there is still significant scope to reduce this figure by continuing to invest in leak detection and repair across the network although we note, there is likely to be an "optimal" amount of leakage and there will be a point where the cost of fixing every leaky pipe would be too large.

The Council also has an important role in reducing its own consumption (currently 2% of the total). We agree installing water efficiency hardware in council buildings and community housing as items need replacing is sensible.

As mentioned, in Wellington businesses consume 26% of the water. The majority of commercial premises pay for the water they use and so heavy industrial users currently have strong incentives to reduce their consumption.

Businesses that are tenants in buildings (office buildings in the CBD for example), pay for their water consumption indirectly through their rentals to landlords. In most cases these charges are not visible meaning pricing incentives to reduce consumption are often dampened down. It may be possible to increase transparency here which would sharpen incentives for office dwellers to conserve water.

Beyond this though, we do not favour the council providing subsidies to businesses to introduce new technologies or practices. These would ultimately be paid for by businesses through rates.

Summary

The Wellington Employers' Chamber of Commerce believes a combination of measures is needed to address Wellington's potential water shortages.

While there is plenty of scope to reduce water demand and waste before investing in new infrastructure, we think it is inevitable that due to likely population and economic growth increased storage capacity will be necessary.

We recommend that consideration be given to increased storage capacity at an early stage as the stakes are high and the costs significant if construction is left too late.

Generally we oppose water regulation and think that a price based mechanism is preferable. Replacing the existing water rates with water charges for households based on metered usage would provide consumers with a real incentive to reduce consumption.

We support continued investment in leak detection and repair, but note there is a point where the cost of fixing every leaky pipe would be too large.

Submission # 81

Department of Conservation (email submission)

Kia ora

COMMENTS ON THE DRAFT WATER CONSERVATION & EFFICIENCY PLAN 2010

Thank you for the opportunity to provide comments on the draft Water Conservation and Efficiency Plan.

The Department of Conservation (Department) has a statutory responsibility to preserve so far as is practicable all indigenous freshwater fisheries, and protect recreational freshwater fisheries and freshwater fish habitats (Section 6 ab of the Conservation Act 1987). The Department also has a statutory role to advocate for the conservation of natural and historic resources generally (S6b).

My very strong preference is that improved water efficiency and conservation are the primary mechanisms for ensuring continuity of water supply for the region for the foreseeable future. I

am unenthusiastic about the prospect of a water supply dam being constructed on the Whakatikei River.

WHAKATIKEI DAM SITE

The Whakatikei River is a tributary of Hutt River and flows through Akatarawa Forest. There is a relatively large catchment above the proposed dam site. I understand that this site will require construction of a water treatment plant and pipeline. There would be flooding of the upstream section and vegetation clearance (pines and natives).

Botanical values

The Akatarawa forest is one of the largest forested areas in the lower North Island and is an area rich in native ferns. The only larger forested areas include Tararua, Rimutaka and Aorangi Forest Parks (which are administered by the Department of Conservation) and Pakuratahi, Kaitoke and Wainuiomata Forests (which are administered by the Greater Wellington Regional Council).

Although parts of the Akatarawa forest have been previously logged and tracked there are still areas of bush in its original state supporting kāmahi, rimu, hīnau and rātā. Both northern and southern rātā occur in the area. Higher up in the forest are plants not found growing at lower altitudes including the mountain cabbage tree (*Cordyline indivisa*), stinkwood (*Coprosma foetidissima*), *Belechnum nigrum* and Prince of Wales's feather (*Leptopteris superba*). The presence of the regionally critical plants such as Kirk's tree daisy (*Brachyglottis kirkii var kirkii*) (vulnerable to possums) and the ferns *Trichomanes colensoi* and *Hymenophyllum atrovirens* make this an important botanical area in a regional context.

Notable elements of the flora in the Akatarawa include:

- *Brachyglottis kirkii var kirkii* - Kirk's tree daisy (Declining, Regionally Critical) - see website of NZPCN (www.nzpcn.org.nz):
- *Drucella integristipula* (a threatened liverwort only known from a handful of sites in NZ)
- *Trichomanes strictum* - fern (Not Threatened, Regionally Data Deficient)
- *Trichomanes colensoi* - fern (Naturally Uncommon, Regionally Critical)
- *Trichomanes elongatum* - fern (Not Threatened Regionally Critical)
- *Grammitis pseudociliata* - strap fern (Not Threatened Regionally Data Deficient)
- *Hymenophyllum atrovirens* - filmy fern (Naturally Uncommon, Regionally Critical)

Whether these species are within the proposed site affected by the proposed dam and associated works has not yet been determined.

Terrestrial fauna values

With respect to terrestrial fauna values there are few concerns about this site, although it's likely the reservoir would swamp a highly fertile site that produces a greater abundance of food for native birds than surrounding areas. However presence of the pine plantation is likely to have already modified the site. Common forest birds and kererū are likely to use the site.

Aquatic values

Aquatic species known to be present in the catchment from the New Zealand Freshwater Fish Database are brown trout, longfin eel, redfin bully, kōura and kōaro. It is also likely that the system supports giant kōkopu, banded kōkopu, non-migratory bully (Cran's or Upland), and dwarf galaxias.

The Whakatikei River system provides valuable freshwater habitat because of the excellent water quality, the presence of native bush providing riparian habitat, and the relatively unmodified catchment. If the dam does proceed it will be critical that fish passage be provided (for both up and down stream movement of all species).

The effects of impoundment by modifying peak flood flows has been shown to have significant adverse effects on spawning of banded kōkopu and kōaro. This is because they

need flood flows to access streamside vegetation to lay their eggs, and again approximately a month later when the eggs need to be re-inundated.

The impoundment of rivers and creation of artificial lakes interferes with many natural processes within river channels, including:

1. Interfering with natural flow regimes - lowering downstream flows, easing flood peaks, changing annual distribution of flows by storing water at one time and releasing it at another in a manner that is not consistent with naturally occurring flow regimes.
2. Increased risk of flooding upstream.
3. Deposition of sediment in the reservoir - raised riverbed, reduced volume of reservoir, lack of sediment downstream which may result in lowering of riverbed, undermining banks, bridges and lowering groundwater levels, depletion of beaches and increased coastal erosion.
4. Retention of organic matter in the reservoir - altering composition and delivery of material downstream which is a key food source for biota and may result in reduced productivity and diversity downstream, also tends to sink and decompose in reservoir which increases oxygen demand.
5. Reduced oxygen exchange in reservoirs resulting in the deeper regions becoming anoxic (oxygen starved), and if released downstream can have adverse effects on biota (this, however, can be rectified by engineered outlets). Reduced dissolved oxygen is also linked with an increase in phosphorous, iron and manganese. Phosphorous in particular can cause an increase in periphyton growth downstream.
6. Altered water temperatures - a reservoir in a forested headwater that is typically cool due to the shade and groundwater contributions, may increase water temperature due to solar heating. A reservoir in lower reaches can act as a thermal buffer where it keeps the water cooler in summer and warmer in winter than normal. These alterations in water temperature can interfere with natural processes such as fish spawning where water temperature is used as a cue.
7. Changes in community composition with a reduction in 'running' water species and an increase in 'still' water species. At the outlet invertebrate communities are generally of low species richness, but high densities and biomass.
8. Risk of invasion by aquatic macrophytes in reservoirs.
9. Increase in benthic algae or periphyton at outlet with reduced flood intensities, supply of nutrients from the reservoir and high water clarity allowing good light penetration and buffered water temperatures.
10. Indirect effects on fish through water quality, food supplies, as well as directly through preventing fish migration, habitat availability and juvenile survival as well as increase competitive interactions among species. Fish passes have been constructed on many dams in NZ but very few have been successful for all species. Upstream as well as downstream passage needs to be provided for. The issue of providing for downstream passage is equally as important as upstream fish passage - especially for eels. Depending on the type of dam if there are turbines these are fatal to large eels trying to migrate downstream to sea to spawn. This is a critical issue that will need to be considered.
11. Reduction in water flows reduces the depth and velocity of water downstream which will reduce the total amount of available habitat and affect the suitability of habitat e.g., species that prefer fast and/or deep water will be most affected by flow reductions. Fish that depend on drifting invertebrates are also particularly susceptible to reductions in water velocity. Flow reductions may also make sections of rivers too shallow for fish migration.
12. Clearance of riparian vegetation equates to loss of riparian cover, reduction in habitat quality, increased bank instability, and potential impacts on invertebrate food supply.
13. Associated infrastructure may require additional river control practices and fish passage issues, and water treatment plant maintenance may have adverse effects on fish downstream of supernatant discharges.

MITIGATION

In the event a reservoir is constructed on the Whakatikei River then mitigation measures should include long term legal protection of the Wainuiomata and Pakuratahi sites, and pest control, including sustained control of goats and other browsers.

With regards to mitigating the impacts on the aquatic values some options available include:

- minimum flow requirements
- fish passes on dams
- flow sharing rules
- cap on total abstraction
- replanting of riparian vegetation

Costing of these mitigation measures must be included in any assessment of options.

CONCLUSION

I would like to reiterate the Department's strong reservations about using dams as a solution to waters issues. Dams should only be considered as a 'last resort' as they have major adverse effects that cannot be fully avoided, remedied or mitigated. Improvement of water efficiency should be the primary measure adopted by the Council. I note that many other major town water supplies around the country and internationally have water metering, and that this has resulted in significantly less water being used by consumers.

I support all of the "proposed key initiatives and focus areas" that have been identified in the discussion document.

I trust that these comments will be useful in the development of an environmentally friendly and sustainable water supply and demand management plan for the Wellington metropolitan area.

The Department does wish to stay involved and to be consulted further by WCC as options are considered further.

Submission # 82

Regional Public Health (email submission)

1 Comments

Part 1 – Water Supply & Demand in Wellington

- RPH **recommends** that the plan makes clearer reference to protecting rights to water including the key factors of availability, quality and accessibility. This should include reference to iwi involvement in the plan.
- RPH **recommends** the plan references the proposed Regional Water Strategy.

1.1 RPH supports WCC's initiative to explore, implement and evaluate measures to reduce water consumption. We support comments in the plan that make links to the social implications of this project. It is appropriate that planning decisions around demand management include a range of other considerations including equity.[6]

Access to water is fundamental to the maintenance of good health. Inequity can arise when resources are not accessible to everybody i.e. are unjustly or unfairly allocated.[7] Measures that aim to reduce water consumption need to ensure that they do not place a disproportionate burden onto low income households or cause them to have reduced access to water resources.

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[6] S.B White and S. A. Fane (2002). Designing Cost Effective Water Demand Management Programs in Australia. *Water Science and Technology, vol. 46, no. 6-7, pp. 225-232*, IWA Publishing

[7] NSWHealth (2003). *Four Steps Towards Equity*. NSW: NSWHealth

1.2 As described above, RPH submits that the plan has potentially wide reaching implications and has implicit connections to the wider determinants of public health including rights to water. This right is captured by the UN Committee on Economic, Social and Cultural Rights General Comment No. 15. In its introduction, General Comment 15 affirms that

> *"the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water, for personal and domestic uses. And it must be enjoyed without discrimination and equally by women and men".*[8]

1.3 RPH submits that the plan should reinforce the key factors included within UN General Comment 15. These are;

- Availability - Each person has the right to a water supply that is sufficient and continuous for personal and domestic uses, such as drinking, personal sanitation, washing of clothes, food preparation, personal and household hygiene.
- Quality - The water required for each personal or domestic use must be safe. In terms of water available for consumption, this would include fluoridated water that achieves standards of potability as stipulated in the Drinking-water Standards for NZ.
- Accessibility - water being within safe physical reach, being affordable, being accessible in law and in fact, and information on water issues being provided.[9]

1.4 Coupled with discussion on water rights and equity, RPH submits that it is appropriate to reference how the plan involves and acknowledges input from local iwi.

1.5 Although the plan references the regional nature of this issue and the contribution to be made by relevant councils, it is unclear as to its fit with the proposed Regional Water Strategy. An explanatory comment in this regard would assist to place the draft Water Efficiency and Conservation Plan into a regional context.

Part 2 – Draft Water Efficiency and Conservation Plan

- RPH **strongly recommends** that the proposed utilisation of rainwater tanks is subject to limitations that will ensure the protection of public health.
- RPH **recommends** that the Health Impact Assessment[10] tool is used as part of the planning process to help ensure that adverse public health outcomes are identified, avoided, and mitigated where practicable.
- RPH **recommends** the plan include reference to potential benefits associated with storm water management.
- RPH **recommends** that the Council list regulatory action / enforcement as an option in the suite of tools available to encourage reductions in water consumption.
- RPH **recommends** that initiatives within the plan offering residential support should include related plumbing support on water heating efficiencies.
- RPH **recommends** that performance measures developed from the plan adopt recommendations made by the Auditor-General.

1.6 The plan presents some commentary on the use of rainwater collection tanks at residential level. Rainwater tanks can provide various benefits to the householder and the community.[11] Currently WCC consumers are supplied with fluoridated water that meets the highest standards of safety and quality for human drinking water.[12] The intent of rainwater collection is not fully clear in the plan.

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[8] World Health Organisation (2003) The Right to Water. Geneva. WHO

[9] United Nations Committee on Economic, Social and Cultural Rights (2003) General Comment No. 15 (2002) The right to water.

[10] 'Health Impact Assessment (HIA) is defined as a combination of procedures, methods and tools by which a policy may be assessed and judged for its potential effects on the health of the population, and the distribution of those effects within the population' – Public Health Advisory Committee (2005). A Guide to Health Impact Assessment: A policy tool for New Zealand. Wellington: PHAC

[11] Abbott, S.E. (2008). Domestic Rainwater Harvesting in Urban Environments. *Water & Wastes in New Zealand Journal*; March; Issue 158 (Pages 39-43)

[12] Ministry of Health (2008) Drinking-water Standards for NZ 2005. Wellington: Ministry of Health

RPH submits that without clear conditions on the introduction or promotion of rainwater collection, the potential exists for consumers to switch from the current reticulated supply to a lower standard of water for household use. We give conditional support to the proposals in the plan on rainwater tanks. Similar initiatives by Kapiti Coast District Council and Waitakere District Council have seen rainwater supplementation limited to toilet flushing and garden use. We would expect similar limitations for rainwater use in the Wellington area. The specifics of intent and design would be detailed in formulated guidelines or similar supporting documents.

1.7 RPH supports the key initiatives and focus areas proposed across the four community sectors. We acknowledge that much of the proposed activity in these sectors is currently under development and therefore lacks specific detail. As this situation progresses, we would recommend that planning is conducted in conjunction with a Health Impact Assessment. This would ensure health and wellbeing are considered when any initiatives or policies are being developed.

1.8 The plan is considered to have a broader interrelationship with wastewater and storm water management. Integrated water resource planning is a key part of sustainable development.[13] Although partially covered in the introduction, potential benefits relating to storm water management are not mentioned.

1.9 With respect to tools available to reduce water consumption, the plan references a number of options available to WCC. The Wellington Consolidated Bylaw 2008 currently has a water services section and RPH considers that the regulatory mechanisms available through bylaws should be listed as an optional tool in the draft plan.

1.10 The plan defines the terms of conservation and efficiency. As is described, regulatory options exist for both conservation and efficiency measures. With respect to prioritisation of regulatory approaches, RPH submits that there is the potential for disadvantaged communities to be disproportionally effected by any mandated requirements. Although approximate costs are provided in Annex 1, affordability is considered to be an important consideration when planning the contribution of these efficiency measures.

1.11 Where possible, any residential initiatives should look to complement other projects where efficiency gains are related. Energy savings mentioned within the plan include those related to water heating. On average a household uses 30% of their energy on hot water heating. Wrapping electric cylinders and pipes will assist with saving a household energy and money. Checking the efficiency of hot water cylinders will also reduce hot water wastage through potential vent leaks.[14]

1.12 RPH supports the need for appropriate performance measures for each of the sector groups. This is reiterated in the 2010 Auditor-General report where it is stated that, local authorities should consider developing performance measures to measure the effectiveness of water conservation – for example, the number/percentage participating in water conservation programmes, and participant satisfaction with education programmes.[15]

2. Conclusion

RPH welcomes the opportunity to contribute to the **discussion document: Water Supply and Demand in Wellington and the Draft Water Efficiency and Conservation Plan.**

As a public health unit we seek to participate in the development of policies, strategies and plans that have the potential to impact on the health and wellbeing of the population, such as the supply, delivery and use of water.

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[13] M Leonard, A. Skinner, D.Wood (n.d). Analysis of the cost of different water management options to homeowners in various regions of New Zealand. ESR Ltd. Christchurch NZ.

[14] Energy Efficiency and Conservation Authority.(2010). Get more from your hot water. Wellington: ECCA Energywise. Retrieved October 2010 from http://www.energywise.govt.nz/energyspot/episode-3/hot-water-wastage

[15] Office of the Auditor General. (2010). Local Government: Examples of better practice in setting performance measures. Wellington. Office of the Auditor General

A Health Impact Assessment would enable WCC to develop this plan in a manner that considers wider public health implications. We would welcome the opportunity to participate in work in this area and to provide further advice or clarification on any of the points raised in our submission.

Submission # 83

B Mitcalfe (email submission)

- I am probably an atypical respondent. I live in a one-person household, and have a water meter. Fifteen years ago, wanting to be environmentally responsible, I arranged for WCC to install a water meter at my home, so that I could monitor my water consumption.
- Many decades ago, while bringing up our five young children, I lived in a rural area, with only 4 x 400-gallon, corrugated-iron tanks to serve our family's needs. There was no supplementary supply, and saving water became a major pre-occupation. While I would not wish to be in that situation again, the experience taught me to be frugal with water, a precious resource. Even today I am careful to use only what I need, and this lifelong habit does not "cramp my style". Re-using water, such as is suggested in the discussion document, comes naturally. Even a bucketing system for grey water is better than none.
- Perhaps it is for that reason that I believe *education is the key to changing lifestyles*. School programmes are a good start, whereby parents can learn from the ideas brought home by their children. For too long we have not been mindful enough of water usage exceeding supply, and we need to get smarter about conserving it.
- We need to get real, and *focus right in on our own lifestyles.* Regulation may also be needed.
- We also need *encouragement,* and *i*deas such as a "free plumbing" service and a web-based water conservation and efficiency portal, (page 5 of the *Draft Conservation and Efficiency Plan*) are a very good start.
- If District Plan changes need to be made in order to achieve efficiency in water delivery, now is the time to start.
- Our new Mayor, Celia Wade-Brown will doubtless be an effective force to initiate action on these matters, and *WCC should take full advantage of this new opportunity*.
- Regarding tank water collection, not much of Wellington city's topography lends itself to tank-stands, and overflow would need to be carefully planned for, on small, steep sections. But large, underground, concrete tanks for rainwater collection should be designed and constructed for new sub-divisions, at the same time as house plans are being drawn up. Even some of the older, larger properties could be excavated to accommodate such tanks, and later be grassed over for amenity reasons.
- I support the efficiency proposals outlined in the discussion document.
- Finally, I am *totally opposed to the construction of new dams.* This would sacrifice large areas of indigenous biodiversity, adding to the huge losses which Wellington's natural environment has already suffered. Instead, as I mentioned before, we need to turn inwards and focus on our own lifestyles in our own households and businesses.

  Eventually this could also bring sustainable energy saving and personal savings.

Submission # 84

M King (email submission)

Introduction

In an age when man has forgotten his origins and is blind even to his most essential needs for survival, water along with other resources has become the victim of his indifference. Rachel Carson

We think of our land and water and human resources not as static and sterile possessions but as life-giving assets to be directed by wise provisions for future days. Franklin D. Roosevelt.

Just stop and think for a minute:

We, as a society do not appreciate the exceptional water resources available to us in this country. Concerned only that water flows to our homes for us to use how we wish in absolute abundance- we then pollute it with chemicals, mix it with excreta and send it out to pollute and denigrate our sea.

The free and abundant rainwater meets the same fate- actively channelled and piped out to sea as a waste product- how utterly stupid and ungrateful a society, have we become.

Our water resource is a significant taonga and should be treasured so.

Comments on the Draft Plan

- After reading over the draft and going along to attend the first public meeting I was surprised to see so few people turn out. The time allowed to notify the public was insufficient as was the level of promotion/ advertising- the proposed plan is a significant investment for future generations- it should have been more comprehensive.
- There seems to be a contradiction in WCC/ Capacity intentions in terms of the focus on efficiency Vs conservation options. I one instance suggesting the:

  "Main focus is on efficiency measures, since these are less onerous on people and provide more reliable ongoing results"

  While in another suggesting:

  "Information and education alone are generally not sufficient to change behaviour, however they are important components of a package of measures, so are likely a key focus of the plan."

  Both of these approaches are essential for the success of any program. Providing accessible, relevant information and education to the Wellington community, I believe, is a necessary first step to get people on board and in touch with the objective to reduce water consumption. The only reference to what Information and Education may entail is the web portal- while this is a great way of getting details and technical information across it does not empower or engage the Wellington community in the process
- The draft plan indicates that the council will save significant amounts of money in delaying the construction of a dam. Although this isn't extra money in the coffers but rather money not committed for interest payments- a significant amount should be set aside to fund the agreed initiatives. The draft does not stipulate the monetary commitment from WCC towards efficiency and conservation measures. Is it tens of thousands, hundreds of thousands or millions of dollars given that up to 4 million/yr will be 'saved' by deferring the dam construction.

Information and Education for Water Conservation

The Draft is quite specific on the councils preferred options for efficiency gains including promotion of water saving technologies. However it is very vague about promoting

conservation measures suggesting only “information and education” and the web portal. This is insufficient.

If the council is serious about trying to reduce residential water consumption then a comprehensive engagement of the public to raise awareness of water use and the technologies available is needed. The Kapiti Coast District Council and other councils around NZ) have an excellent program to engage and support the public in managing water use.

Utilizing a workshop format where people can see the quantities of water used would be a valuable first step. This could be as a sign up/ resister type workshop. Or as demonstration type with displays around the city at community markets, school gala’s, Home and Garden show etc.

Porirua City Council is preparing a Schools Kit on water education - this could be integrated with the workshops to get children involved.

Topics covered in a workshop could include:

- Water and You - Why water is important.
- Water situation in Wellington- where it comes from, energy inputs and treatment.
- Household water use- examples of water use in laundry, toilets, showers etc.
- Saving and water efficiency measures- simple behaviour change and technologies.
- Summer outside water use- irrigation, drought tolerant plants and landscaping to low water use.
- Water for emergencies- simple rain water barrels.

From raising community awareness other measures to reduce consumption can be engaged.

Imposing Water Restrictions

Water restrictions are an effective and quick way of reducing demand. **IF** households are aware of the water situation and reasons for imposing restrictions then greater limits on water use during dry periods will be more accepted. Weather predictions can be made well in advance with reasonable accuracy so restrictions can be imposed earlier to mitigate any serious supply problems.

Green Plumber.

This is a great idea and has been a great success in Kapiti. However Wellington is a significantly larger metropolitan area and hence may require several plumbers to keep up with the demand. It would be a great job for a young person who had recently completed the trade certification.

Integrating the efficiency and conservation plan with water storage for emergency supply

Wellington is in a precarious situation if a major disaster were to strike. Our water supply comes from over 50 kms away and travels along a major fault line. If this line were to be severed in an earthquake the city may be without water for several weeks. It is imperative that we have emergency supply within the city and NOT connected to the municipal supply (which, in all likelihood be severely damaged).

In addition to this large scale water tanks can be used to provide water for non potable uses that make up to 65% of household water use. Use of rainwater tanks in such a way will reduce energy costs from elimination of treatment and pumping while also reducing storm water runoff.

Promotion of rainwater tanks or barrels within this plan is an effective way to:

1. Assist households with providing their own water supply for an emergency.
2. Providing some additional supply for outdoor watering of plants.
3. Engaging households in responsible water use.

All community hubs, buildings and civil defence posts should be provided with significant rainwater collection and storage systems. These are already in place in the Hutt Valley (although they are filled up via tanker from municipal supply!!). Rainwater tanks fitted with

simple first flush diverters are a perfectly adequate supply of quality potable water as is evident all around New Zealand.

Promoting the use of rainwater tanks or barrels could be integrated into the workshops detailed above as a demonstration model whereby households could apply to have them installed at a subsidized rate by a council approved contractor.

Key points of any Action Plan

- An impression that I get from reading the draft plan and attending the public meeting is that the WCC/ Capacity has already made up its mind to build a dam. If the council is serious about promoting water efficiency and conservation measures to reduce demand then it needs to commit to it at a scale that will be effective. There is no point in half measures. Why waste ratepayers' money on a program that will not deliver - just build the dam.
- Information and education that engage and reach out to as many people as possible is a necessary first step- get people on board with the situation and intentions of the strategy then implement the 'hard' efficiency technologies.
- Grasp the opportunity to integrate this strategy with other water related issues like emergency supply. We have world experts in rainwater catchment and use- lets use this valuable resource. Integration with civil defence and climate change action will make for a more resilient community- especially in wake of the Christchurch earthquake disaster.

Submission # 85

N Urlich (email submission)

My name is Nick Urlich, I am making a submission on behalf of myself.

I work for Capacity in the Water and Waste water area. I monitor flow data from over 150 reservoirs, pump station and area meters, to assess daily demands from 60 District Meter Area (DMA) zones within Wellington City. This data is fundamental for prioritising where leak detection is to be carried out in Wellington City. I have also previously worked for Greater Wellington in the Water Supply Engineering Consultancy Group monitoring water flows throughout the region.

I believe that there is also a fundamentally bigger issue than water conservation, and that is security of supply. Greater Wellington was involved in a GNS study of the Impacts of a Wellington Fault Earthquake on the Wellington Regions Bulk Water Supply (Report presented at the 2010 NZSEE conference - *http://db.nzsee.org.nz/2010/Paper54.pdf*). The modelling carried out in the study indicated that it is likely to take 5-8 weeks to restore the water supply to Wellington from the current supply sources. Modelling showed that having the Whakatikei Dam could reduce restoration times down to 3 weeks before water could be again supplied into Wellington. The cost to businesses of being without water for over three weeks is likely to run into hundreds of millions of dollars; far more than the cost of a dam. The estimated probability of rupture in the next 100 years of the Wellington Fault is ~11% (1 in a 1000 probability - *http://db.nzsee.org.nz/2010/Paper23.pdf).*

Conserving water is no doubt beneficial to the environment as well as financially. But I don't think it should be used as an option against building a Dam or installing meters. If there is no water coming into the city, there is nothing to conserve. Greater Wellington targets a 1 in 50 year (2% chance of occurring) drought return period for supply the Regional *http://www.gw.govt.nz/assets/Our-Environment/Water-Supply/PDFs/Bulk-Water-Strategy-Detailed-Information.pdf* , that happens to currently be around 1 in 20 year (excluding climate change impact). International best practice is typically around a 1 in 200 year event (as it is in Auckland *http://www.arc.govt.nz/council/civil-defence-emergency-management/natural-hazards/drought.cfm*). I would suggest having water available for a 1 in 100 year event should be the minimum acceptable for the Capital City.

I believe that the proposed Wellington City Water Conservation options (Meters, Dam or Conservation) have not allowed for how the Wellington Regions Water Supply network operates. Wellington is at the end of the water supply network, with UHCC, PCC and HCC getting water before it comes into Wellington. Water supply security is a regional issue and

therefore for any water conservation or metering programme in Wellington to be successful in avoiding water shortages the other three cities (HCC, UHCC and PCC) need to be doing the same. If the other Cities are not managing their water demand and conserving water then Wellington will probably have shortages if drought conditions exist. Residents in these other cities will only have a partial incentive to reduce water usage when they are likely to still have adequate supply.

Wellington residents are not typically heavy users of water in summer, as their usage for garden watering isn't very extensive relative to the other three cities. Peak days in Wellington City over the last few years have rarely reached 100 million litres per day where the annual average daily usage has been around 75 million litres. Other nearby areas such as on the Kapiti Coast would be supplying 2-3 times the average daily usage on hot summer days *http://www.kapiticoast.govt.nz/Projects/Water-Supply-Project/Water-Supply-Project-frequently-asked-questions/*.

Any conservation efforts may also be undermined by high rates of new leakage. The average age of pipework in Wellington City is about 40 years (with over 25% AC pipes) and new leaks can occur rapidly. For example once a DMA zone has had all the leaks repaired it is not unusual for leakage to be back at pre-repair levels within 3 to 6 months. Several big leaks in summer could have a much larger negative effect of water wastage than any positive conservation related savings. Greater Wellington needs to be able to supply the water needed for each city allowing for a reasonable amount of leakage contingency.

Trying to enforcing water restrictions when they are most needed can also be very difficult. Businesses often see it as their right to use as much as they want because they are paying for it. Large users such as the abattoir's in Wellington are unlikely to voluntarily reduce their usage during the peak season as the financial impact will be massive. As the majority of residents are not paying for water based on the amount they consume some will flout restrictions, especially as it takes time to locate offenders and the consequence of getting caught may not be strong enough to stop them using excessive amounts of water. We still need an adequate supply of water in summer allowing for some leakage, wastage and higher demand.

Submission # 86

R Averton (email submission)

I make this submission as an individual and do not wish to be heard.

I have read the promotional information; the 'Discussion Document' and attended SPC briefings prior to notification.

Submission:

I substantially support the implementation of water efficiency measures suggested and am opposed to the construction of any new dam ie: "storage facilities on the Whakatikei River or elsewhere, in the foreseeable future; that is until the actual population of Wellington {Miramar to Tawa inclusive} exceeds 500,000. I also oppose the installation of meters believing that the costs* will not justify the supposed benefits. [NB: Fairly assigning - economic, social and environmental costs to include both actual and incidental contingencies, e.g.: installation, monitoring, "reading", servicing, reliable provision of supply etc.

I also support deferring all substantial infrastructure development instead preferring that residents be encouraged to conserve and where possible minimise water use. I believe that any interruption of water supplies is likely to be a result of a natural disaster which cannot be predicted when one notes that Wellington is built on or near at least 4 known earthquake faultlines and to a coastline susceptible to both earth and tidal (tsunami) movement. Building on reclaimed land also presents unpredictable risks to our water supply.

Commercial users should also be obliged to conserve and where possible re-use water they should be charged the full cost of their consumption and their rates increased.

Consideration to the disadvantages of building large apartment blocks to replace single residences should be factored in to any planning model.

The simple equation is that a single resident multiplied by 30 seriously impacts on both waste and storm water capacity, both in the use; the disposal, inevitably to the harbour. The flat

parts of the City are especially susceptible to land failure caused by undetected leaks and seepage from existing pipe networks being damaged but not identified during construction.

Using vegetation to mitigate water loss is a sensible option. Trees absorb approximately 90% of the water flowing past them and thus are sustainable. Carbon Credits accrue when trees are sustained. Escarpments denuded of vegetation are at risk of both run-off and slippage both significantly costly in terms of remediation.

All infrastructure activities should incur a premium, paid for by the developer, to manage the possible costs of mitigating water flow from either the hills or from around the harbour. Any new structure that is likely to require a pumping station, eg: ISC, must be required to account realistically for the costs to the community at large; and to be obliged to reimburse the City for any unplanned disruptions to supply caused by the development work being carried out.

All developers should be obliged to pay for the environmental impact of their development, that payment must include reimbursement for the damage to flora, fauna and the cost of loss of amenity to residents during the construction phase at the very least. Archaeological sites should be protected from incursions of water whilst sites are developed and evidence of earlier habitation should be preserved so that it may be viewed by all citizens at their leisure.

Building on or near Wellingtons many reclaimed sites requires great consideration at the planning stage to ensure that whatever is built will have minimal contingent effect in surrounding areas. By this I mean that disturbing waterways may also result in surrounding buildings becoming susceptible to water damage and for the land to become unstable putting people and buildings as risk.

The social implications of charging for water and water meters would have the greatest impact on those least able to afford the charges. Citizens have a right to have access to clean water readily available to guard their health.

Water restrictions should only be imposed when there is a significant draught (ie: two months without substantial rain and all reservoirs at their lowest ebb). It would be acceptable at those times to restrict the use of “clean” water for non-essential uses by this I mean establishing “water stations” where cars can be washed with free “grey water” and where “rainwater” is available in containers (deposit for re-usable container) to allow gardeners to collect water for sprinkling. Its important that Council staff seek the co-operation of citizens for all activities. Washing ones residence or building should be a restricted activity during a draught. Commercial external cleaning Operators should have their licenses to operate restricted during any draught (see definition above).

Arbitrary restriction should never be imposed by Council.

I support the following measures:

- Council providing a ‘free’ plumbing service to assist in leak detection and repair of domestic devices.
- The provision of “free” expert advice to all water users.
- Funding support by grant to residential users to aid in the installation of new rainwater tanks
- Increased investment of Council resources dedicated to initiatives such as: leak detection, pipe replacement and repair across all of the Council network.
- Substantially increased investment in isolating and identifying Wellingtons’ subterranean network of culverts, streams and post settlement reclamation sites with the goal of producing a map that shows the entire network from 1840 to the present.
- Council resources should be dedicated to the upgrade of community housing and the installation of water conservation hardware eg: shower heads, front loading washing machines and waste disposal units *[which apparently use fewer resources than taking or sending rubbish/recycling to the dump],* toilets with dual flush low volume or other environmentally sensitive lavatories etc.
- Council should require all commercial users to have water meters installed and to be charged for their actual usage of water; whether clean or “grey” and for the treatment of all waste water so that where possible it can be re-used.
- All new buildings should be required to have water efficient hardware installed and to provide a “water usage plan” showing the proposed occupancy of any building and the possible impact on both waste and stormwater infrastructure.

- Council should subsidise the installation of rain water tanks for residents and owner occupiers including those of flat owning companies.
- Council should subsidise the replacement of existing taps with low flow or drip resistant ones when called to service or repair existing taps as part of the proposed "free" plumbing service.
- Council should provide grants to residential ratepayers to subsidise the replacement of "hardware" such as dishwashers, washing machines etc, with low water use models.
- On request Council should provide a list of exotic and native vegetation that would benefit the terrain by retaining escarpments and absorbing water simultaneously improving our carbon credit status.

NB: *should there be a decision to compel residents to install true "smart" meters then full funding by way of grants should be provided based on means.*

Conclusion:

I understand that the costs of deferring the erection of a dam but think that it is a prudent decision that reflects the fact that any such "development" on terrain susceptible to earthquake, as this land is, should not be excavated.

Wellington is built on an area that is crossed by 4 known fault lines.

It appears that there is no great urgency in changing our water consumption habits. Increasing charges and installing meters seem an over reaction. Especially the latter, which will impose many costs on citizens especially the poorest. The majority of residents feel over-burdened by high land rates already. Predictions of population growth are notoriously unreliable. *I have recently read an article written by Dr.Bill Sutch in the early 60's that quoted predictions for a population of Wellington City being 200,000 by 1980.*

Demand increases in summer but climate change will doubtless ameliorate that impact.

I do not support loans as they would require prudential oversight to ensure repayment and would also incur a cost that may outweigh their value to the community.

Please do not hesitate to contact me for any clarification of the points raised.

Thank you for this opportunity.

Submission # 87

L Kininmonth (email submission)

Let me tell you a wee story. A few days ago I decided to do an experiment to see how much rainwater I could collect off my shed roof – so that I could use it to water my seedlings, wet my compost, provide drinking water for my chooks, and wash my hands when I'm out in the garden – and out of curiosity (since I am moving towards as much self-reliance as possible on our typical Wellington piece of suburban land). On that first day I collected around 20 litres of water: firstly in a bucket, and then, as I watched what was happening and noticed the amount of splashing (and water loss) that caused, I located an empty emergency water supply container and developed a way of "training" the water to flow down a hazel tree branch so that it would actually go into the container mouth (as there is no guttering or down pipe on the shed). The next day I did some Google reading on water collection methods, and researched a company called Tanks a Lot that supplies rain barrels and fittings (based in Waitakere – I believe) and marvelled at what is possible: water management being a key feature of permaculture design. I decided to buy a rain gauge to be a bit more scientific about it (not just to record our rainfall for my garden diary, but to calculate what could come off (a) my shed and (b) our house).

Based on Wellington City Council data that we receive around 1270mm of rainfall per annum on average, I did some calculations on what water harvesting we could potentially do – and the numbers are astounding (see my spreadsheet attachment) – assuming I've done my calculations correctly!

It went through my mind that there was a massive opportunity going begging in Wellington. As I understand it, we are on permanent water restrictions and we need to either reduce consumption or build new infrastructure to supply more water. In addition, I would imagine that our stormwater system is a major component of the city infrastructure, and that the overflow going into the sea is a valuable resource being "wasted". From a systems thinking

point of view, it is crazy that we are wasting what we are short of because the two components (water in to a property and water out of a property) are not in optimal relation with each other. The short answer that provides a win-win for everyone is on-site water harvesting.

The next morning I woke up to hear your request for input, and thought “why not put my two bobs worth in?” It was so timely in my thinking process!

Only the week before I had been in Auckland, and spoke with a friend about water harvesting, etc and he said they had “been using water meters forever, but no-one even knows where they are on their property or even looks at them. They just pay the bill.” I also spoke to my parents in the Nelson area, and the situation seems similar there. Even though they should (theoretically) be incentivised to reduce consumption because they are paying for it – it doesn’t seem to work that way. It doesn’t appear that the transparency (or even the passing on) of the cost of water works to change behaviour.

Over the years (as an organisational psychologist) I have given a lot of thought to changing human behaviour, and have been actively experimenting with changing my own.

The distillation of my thinking is that the best way to create a win-win-win-win-win for individuals, their community, the municipal infrastructure, the country as a whole, and ultimately our environment is to put people’s attention on what is needed (in this case: a self-supporting, sustainable water system) and why it is needed (most people will act rationally when faced with such information). That is the starting point (rather than start with introducing water meters). To overcome natural inertia (“too busy”, “too expensive”, “can’t be bothered), economics can be applied as a lever to incentivise change – since transitions are costly (running concurrent systems in the interim, putting in the infrastructure and education, etc). (As a side note: I see a key role for local and central government in speeding up change by subsidising the costs of transition from an obsolete to a new system. It is a great investment, as it will reduce government expenditure in the long term.) So, the idea would be to use the “carrot approach” with the threat of the “stick” looming in the background.

Rather than putting in costly water meters (and/or putting in more large-scale water capacity), I recommend that the Council puts the equivalent money into a scheme to enable householders to rain harvest themselves. This might include (for a start) providing low or no cost or subsidised small-scale water barrels and installation support and education on how to best collect and use such “free water” in the garden, help with setting up a system to disperse the water to where it is needed in the garden, etc, fast-tracking permits or waiving resource consent fees (if any), requiring all new developments or renovations to incorporate some element of rain-water harvest. Later in the scheme it might evolve to provide advice, materials and installation support for whole of roof water harvesting, recycling greywater, filtering rainwater for human consumption, and composting toilets (since they use so much water). Such an approach – softly-softly – is incredibly effective (I believe) at lighting a fire under people to want to do it: curiosity, self-interest (something for nothing), tapping in to the good old kiwi DIY/#8 wire mentality. Just make the first step really easy for people to take.

Another suggestion I have is to start with a small group of volunteers as guinea pigs for the approach. Get these keen people to fine-tune things, help design the approach, experiment with what does and doesn’t work. Generate some case studies – lots of photos, videos on utube – create an educational and DIY website, sponsor local courses through garden centres etc. Then when that’s humming, roll it out to the community as a whole.

The beauty of water harvesting (as I understand it) is that it is incredibly low risk for all parties, and the pay-off is huge. Any overflow just goes back into the stormwater system where it would have ended up anyway. Small-scale (250litre) barrels don’t require special engineering input, and can be purchased and set up relatively cheaply (say $500 all up). And once critical mass builds, there will be a tipping point – and it will become the norm.

All it takes is one small step...

PS Just prior to yesterday’s rain event, I installed my rain gauge in the morning and by night time it showed that we’d had 15 mm of rain. And I collected 30 litres of rain water off my shed roof! My garden is going to love that...

[*Following provided as spreadsheet attachment by with submission*]

Rainfall calcs				
Per annum mms	1270			
# weeks	52			
Average rainfall per week mm	24.4			
Possible water capture per mm (litres / square metre)	24.4			
Likely water capture per mm (litres / square metre) – loss of 20%	19.5			
Roof area square metres (estimate)	100			
Likely rainfall capture per week (litres per mm rainfall times roof area)	1954			
Therefore would need total storage of (4 weeks) to capture all rainwater	7815	If going to capture all winter water, not use for household purposes just garden, would capture from April to October (7 months) and use from November to end March (5 months).		54707.69
Maybe choose 10000 litre capacity for winter storage for summer use in garden especially if not being used to flush toilet, fill washing machine (which empties it out regularly) and if using composting toilet, would be lower requirement				
Maybe would be good to have unobtrusive under deck storage system for emergency purposes? And for watering cranberries, feijoas, greenhouse, seedlings downstream				
Perhaps start with a couple of barrels around house for watering "house gardens" and seedlings, etc - especially if use low flow gravity fed drippers - to see what quantities get				
First flush system necessary to divert roof debris prior to collection				
1 barrel by garage: hand washing, etc		frequent use		
1 barrel by front porch: water that garden		only used in summertime (greater storage required)		
1 barrel by cat door (raised): water camellias and raised garden bed, also for taking up to chooks and trees		frequent use - smaller barrel ok		
1 barrel on/under deck: water deck garden, use for seedlings		mainly used in summertime (greater storage needed)		
1 barrel under heat pump: extra seedling water		mainly used in summertime (greater storage needed)		
1 barrel for shed: extra seedling water (maybe start with this one)		mainly used in summertime (greater storage needed)		
Typical rainfall per week to capture	2000			
# barrels / tanks	5	Shed area	Shed capture (l/w)	4 week store
Barrel capacity each (minimum 1 week store)	400	3	59	234
4 week supply recommended	1600	Optimal capacity each tank		

Submission # 89

AECOM (email submission)

The Water for Wellington draft conservation and efficiency plan sets out a choice between water shortfalls, increasing supply and an aggressive reduction in demand. Whilst these broad options cover the spectrum of options available to Council, we do not believe that they are mutually exclusive.

We consider a balanced approach, including demand management, would allow for the deferral of major infrastructure investment. We suggest that a range of measures are available to Council to bring it to the forefront of water efficiency in NZ.

We would suggest that the Council considers a variety of measures, including the following:

Bulk water supply:

- Active leak detection on bulk network to minimise losses in delivery – *it is recognised this is the responsibility of GWRC, but will demonstrate to the public that all publicly owned assets are managed efficiently*.

Reticulation network:

- Establishment of an accurate economic level of leakage (ELL) and reduction of leakage to meet this target. The use of ILI as a benchmark has limited use as an accurate measure of network efficiency and improvements.

- Installation of full district metering across Wellington – this should include the creation of district metered areas capable of providing meaningful data for operational management including leakage (see below).
- Installation of automated meter reading technology on all district water meters, allowing real time or near real time data to be analysed.
- Target non-revenue water:
    - identification of illegal connections
    - new unbilled connections
    - only allow metered standpipes to be used on the network & bill according to usage
- Target network leakage. Including:
    - continuous monitoring of leakage levels;
    - instigate active leakage control (ALC).
    - targeting of areas with high leakage levels;
    - rapid response to identified burst mains;
    - use of latest techniques and technologies (e.g. acoustic loggers)
    - prioritise repair of leaks & bursts (pipes leak from when they burst until they are fixed, not identified)
    - promote a 'leakbusters' number to enable the public to call in leaks for repair
    - set leak detection and repair targets and report on performance against these
    - factor leakage rates into future renewal planning
- Ongoing pressure management across Wellington:
    - additional PRV
    - PRV controllers (e.g. flow modulation) to allow intelligent pressure control
    - regular checks on performance of PRVs and annual servicing to maintain benefits
- Review minimum pressure supplied to properties – can the current 25m minimum be reduced to 20m?

Residential usage:

- Establish a bylaw that obliges residential properties to not waste water (i.e. compel them to fix leaks etc.) – *this may require national legislation*
    - This may be offset by offering a free leak detection service & fixing the first leak for free & subsequent ones for a fixed fee
    - Council may wish to review its policy on household ownership beyond the boundary if this is confirmed to be a significant issue for future demand management
- Promote use of water tanks (including district plan change 72)
- Requirement for all new buildings to meet standards for water conservation – *this may require national legislation*
- Water meters:
    - water meters have been demonstrated to reduce usage.
    - there is evidence that usage creeps back up after 3-5 years as people understand how cheap water is
    - people's behaviours can change when meters are installed e.g. when restrictions are imposed, people may ignore them as they are paying for what they use
    - Require all new properties to have water meters installed – *this may require national legislation*
    - Require all properties with swimming pools to have water meters installed – *this may require national legislation*

    - Establish a bylaw that once a water meter has been installed on a property it must remain metered in perpetuity – *this may require national legislation*
    - Allow properties to opt in to a meter cheaply & easily now (perhaps a web savings calculator)
    - It is now recognised that water is a universal human right, with the implied repercussion that no one can be denied this. WCC will need to understand the effects and mechanisms for non payment e.g. installation of flow restriction devices on non paying residential properties
- Ensure all community housing meets high standards for water efficiency and are regularly checked for water wastage.
- Grants for water efficient devices
- Consider and incentivise grey water, roof tanks etc

Commercial usage:

- Ensure all commercial properties are fully metered
- Establish a bylaw that obliges commercial properties to not waste water (i.e. compel them to fix leaks etc.) – *this may require national legislation*
- Requirement for all new buildings & renovations / refurbishments to meet standards for water conservation – *this may require national legislation*
- Assistance with water usage audits, including demonstration of $ savings
- Develop strategies requiring medium to large to create water management action plans, set best practice benchmarks, provide staff training and, improve water efficiency

New dam:

- This (or other water supply option) will ultimately be necessary
- Likely to require a long lead time for RMA consents and appeals – planning should continue
- As seen with other consents (e.g. Waiwhetu Stream), it is now necessary to demonstrate all other options have been carried out – demand management & water efficiency will assist with this (as per above)

Water usage education:

- Website to demonstrate water saving / efficiency methodologies at home and in the workplace
- Work closely with garden centres and plant suppliers to educate people:
    - promote native water efficient plants / gardens
    - sensible water usage in the garden
    - mulching beds
- Leakage in the home & workplace
- Promote rainwater collection systems – whilst these equate to a higher cost per property than the proposed dam, they will assist in reducing demand.

Water restrictions:

- These are never popular, however if WCC is able to demonstrate a range of proactive measures being undertaken, then these will be better received
- These should only be applied at times of water stress and only in conjunction with all councils supplied by the GWRC water sources.
- WCC should demonstrate restrictions are being implemented early for non essential WCC activities e.g. fountains etc. as demand rises, with early notification to the public to consider usage to extend the available water resources
- Non essential usage of water (e.g. car washing) should be included in all restrictions
- Enforcement & fining offenders is a strong measure that will act as a deterrent to other offenders. Council should be seen to target all offenders rather than just high profile users or certain areas.

It is worth considering that all water efficiency measures should be undertaken on a regional basis to maximise benefit for the Wellington region.

In addition the management of rainwater through the use of rainwater tanks etc will assist with the reduction of SW & (WW through illegal cross connections) spend.

Submission # 90

A McLean (email submission)

The Public Notices in today's Dominion Post invite submissions on the City's water supply. Three options are mentioned, and it is suggested that there is no need to make a decision on the option for several years.

With respect, may I suggest a fourth option that could be activated immediately?

Every year, millions of cubic metres of water run off our roofs, flood our stormwater drains, and are dumped, turbid and laden with decomposing nutrients, into the sea. Meanwhile, we water our gardens, wash our pets and cars with treated drinking quality water. This is insane!

For a relatively small sum of money, households could retain some of this water in a separate tank, and use it for purposes that do not require treated water. If a reasonable percentage of households had even a 500 litre tank, and used the water for these purposes, it would appreciably diminish water demand, especially in times of relative shortage. And it would help a little to alleviate problems with surface flooding and overflow of drains. Fitting such a device could become a relatively small cost requirement for permits for new homes, doubtless unwelcome in the short term, but a boon in the medium to long term to owner and City alike.

There are commercial models of small footprint rectangular tanks that fit neatly under the eaves of a house, and could be linked at low cost to a downpipe, with appropriate overflow provision. One Australian model (Gutterwitch) is available from large hardware stores, but is usually not displayed or held in stock due to its bulk. Use of such a device could be incentivised by way of a water charge rebate for a year or two, if an approved model were installed by a certified provider and installer. It is likely that there is already a serviceable Standard or Code of Practice that could be adopted, to control the costs of such a certification process.

A prize could be offered for development of appropriate Kiwi-designed and manufactured storage systems to a relevant Standard. This would publicise the concept, and create media interest, as well as possibly providing some additional employment in design and manufacture, alongside the conventional round PVC tanks commonly available for farm and industrial use.

In the Public Notice, there was no indication of the address to which submissions on water should be directed, so I would appreciate it if this not new but perhaps useful idea could be passed to the appropriate persons.

Submission # 92

Greater Wellington Regional Council (email submission)

Thank you for the opportunity to comment on the Wellington City Council Draft Water Conservation and Efficiency Plan. Greater Wellington commends the City Council for its initiative and for showing leadership with its community in raising the profile of this important issue.

The Draft Water Conservation and Efficiency Plan has been developed by Wellington City Council to explore, evaluate and implement measures to meet future water demand. We note that three main options have been determined; status quo (with more water restrictions), a major dam or water demand measures such as universal water meters and tariffs.

The Greater Wellington Regional Council's interest in water management is through the Regional Policy Statement and regional plans, and also as the wholesale water supply provider to Wellington, Upper Hutt, Lower Hutt and Porirua cities.

Please note that this is a staff submission, as it has not been formally endorsed by the Greater Wellington Regional Council

Wholesale Water Supply

The reduction in total water consumption by Wellington City (together with Upper Hutt, Lower Hutt and Porirua cities) over the last three years is significant. Total consumption for the four cities over the last financial year reduced by 2.4% to approximately 374 litres/person (gross).

While weather patterns, the increasing adoption of more water efficient devices (such as low flow showers and dual flush toilets), and to some extent the recession, may have had an impact on the consumption level, we believe the contribution of Wellington City Council's (WCC's) efforts in leak detection, repairs and its renewals programme has been effective. We note that the draft Plan states that a recent study by MWH NZ Ltd found an increase in the leak detection budget would be worthwhile, and therefore Greater Wellington encourages WCC to increase its budget in line with those findings.

One of the options identified is to essentially do little additional, and live with water supply shortfalls. While this is a valid option, it should be recognised that Greater Wellington has previously agreed a security of supply standard with the four metropolitan cities and has adopted a 2% probability of shortfall. If following this consultation, WCC concludes that greater risks could be taken, then agreement is needed between all of Greater Wellington's water supply customers to change the security standard.

Adoption of a lesser security of supply standard has a limited time horizon. The difficulty with such an approach is that it relies on being confident that weather, rainfall and consumption levels over summer can be predicted with sufficient accuracy to allow the right level of demand restrictions to be implemented at the right time, to ensure that future water supply needs can be met. Over time, with population growth, the level of confidence falls so that more arduous restrictions are likely to be implemented for longer.

We note WCC's intention to work collaboratively with the Greater Wellington and the metropolitan cities. We fully support that intent, to ensure clarity and consistency of messages and their language, coordinated timing of delivery, common definition of key terms and results of analysis.

There is already a range of local and national information on conservation and water efficiency in the public arena, including web-based information and tools. There is the potential to confuse the public through conflicting messages. We believe the information needs to be carefully managed and that will best be achieved by working collaboratively together.

Greater Wellington agrees that rainwater tanks can be useful, particularly for emergency water supply, and it is pleasing to see that this is an option WCC is exploring. However, rainwater tanks in isolation are likely to have minimal impact on Greater Wellington's planning for new water supply infrastructure. This is because in years of extreme drought householders will still place a very high reliance on the public water supply system.

The initiatives and responses to water conservation and efficiency by all four metropolitan cities will influence the timing of water source development. Greater Wellington would like to see WCC develop an action plan with targets and a timeline that will provide some certainty about likely future water demand to assist with regional water supply planning. The action plan could include a programme of incentives, publicity/education and regulatory mechanisms in addition to continued leak detection. The Wellington Water Management Plan may be a useful reference document in developing the programme. The Action Plan could cover:

- Stronger incentives for the uptake of voluntary domestic water meters
- Reduced consenting costs for voluntary installation of domestic rainwater tanks where connected for toilet flushing
- Reduced consenting costs and development contributions for green field developments utilising rainwater tanks for toilet flushing and/or on-site stormwater management
- Encouraging the retrofitting of water efficient appliances, low flow shower heads and toilets
- Assessment of supply pressure management opportunities to potentially reduce domestic consumption – we note this is not specifically included in the draft Plan at present.

Regional Policy Statement

The issue of water use and conservation is finely balanced between the supply of water for the health, social and economic well-being of the residents of Wellington and the actual and potential impacts on the environment. Policies in the Greater Wellington's current and proposed Regional Policy Statements attempt to balance these challenges and include direction for managing freshwater supply while protecting aquatic and other indigenous ecosystems.

The current Regional Policy Statement highlights that fresh water is essential to the social, economic and environmental well-being of the Region. It identifies competing uses and values of freshwater, a loss of freshwater habitats and an increase in the use of freshwater as regional issues. Policies direct the management of the quantity and quality of freshwater and the need to promote conservation and efficient use. To date, only Kapiti Coast District Council has initiated a district plan change (75) that seeks to manage freshwater demand, by requiring water tanks and/or grey-water use for new dwellings.

The proposed Regional Policy Statement was approved and notified by Council in May 2010. Eight appeals have been received and informal discussions with appellants have begun. No date for formal Environment Court mediation has been set.

The proposed Regional Policy Statement (PRPS) highlights that increasing demands on limited water resources and the poor ecosystem function of rivers, lakes and wetlands are regionally significant issues. It proposes a number of policies to direct regional plans to effectively manage these issues. Currently all Greater Wellington regional plans are in the process of being reviewed and the PRPS gives a clear signal of the issues and what will need to be included in the new regional plan, and therefore provides a guide for the future direction of water management in the Wellington region.

The PRPS also addresses water efficiency and water use for water supply purposes. It directs the regional plans to include provisions that promote using water efficiently e.g. harvesting water when it is abundant and making more water available when there is a shortage (policy 18).

Policy 19 of the PRPS seeks that regional plans prioritise water abstraction for public health through the taking of water for public water supply, for reticulation into the network and for domestic and community supplies.

Greater Wellington supports the efficient use and conservation of water by requiring water collection, water demand management options and water reuse and/or water recycling measures to be considered when district plan variation and changes are being proposed. Policy 44 emphasises that rainwater collection from roofs, water recycling and grey-water reuse can reduce demand on the amount of water taken in times of shortage.

The proposed Regional Policy Statement also includes policies that promote efficiency and conservation of natural resources including water conservation and efficiency measures such as setting targets for reducing leakages in reticulated water supply and educating the general public on water conservation tactics such as promoting water efficient household appliances, planting locally appropriate plants and using grey-water irrigation and recycling.

Summary

Greater Wellington commends the Wellington City Council for its initiative and for showing leadership with its community in raising the profile of this important issue. We acknowledge the good intent behind the development of the Draft Water Conservation and Efficiency Plan, and encourage the development of an action plan with targets and a timeline that will provide some certainty about likely future water demand to assist with regional water supply planning.

Greater Wellington welcomes the opportunity to work collaboratively with the Wellington City Council on any such action plan, and also to ensure consistent and clear messages to the community about water supply and management.

Thank you again for the opportunity to comment on the Draft Plan.

David Benham

Chief Executive Officer

Greater Wellington Regional Council

Submission # 93

M Givon (email submission)

I would like to submit my ideas for water conservation methods in the Wellington Region- that apply to the all of New-Zealand

As I see it Rain is Living water- It is a renewable sustainable and high quality water source for all

Water is a commodity- We In NZ MUST think outside the square- change our attitude and behaviour in utilizing it.

Collecting Rain water can meet Approximately 65% of household water

- Harvesting rainwater can reduce the use of potable water in all aspects of life.
- Harvesting rainwater brings a greater water independent for its users.
- Harvesting rainwater- is a good water source for landscape irrigation, The rainwater does not contain potential toxin and chemicals from treatment plants etc.
- Harvesting rainwater can be used as EMERGENCY Water Supply in case of earthquake and other civil crises.
- Harvested rainwater can be used as first FIRE Protection- Prior to the emergency Services arrival.
- Harvesting Rainwater should improve Capital improvement of each property.
- Rain water Harvesting is cost effective when compared to well/bore drilling.
- Rain water Harvesting- Is an onsite storm water retention and aquifer recharge.
- Harvesting rainwater greatly minimize storm water runoff and harmful effects to the environment. These includes erosion ,water pollution, sedimentation and costs of infrastructure ,maintenance and repair.
- **Rain water Harvesting is The Environmental Sound Choice-** Doing good for all present and future.

How to do that-

1. Rebates –Council should consider providing rebates to existing households that wishes to install Rainwater collection to their properties, and rebates & or waving building consent to new dwelling that install a complete rainwater harvesting system for gardens + toilet cisterns etc.
2. Changing building resource consent policies- By changing the building consent policies to encourage rain water harvesting –

   The council should-

   Enforce every commercial dwelling to install a rain water harvesting tanks (underground- under car parks etc) for use on this specific site needs.

   Each new dwelling should install (by by-law) a rain water harvesting system to run all outside taps-

   Irrigation to gardens and lawn-and toilets cistern. By using a RainSaver device switch we can assure that In an event of long dry periods-the Rain Switch will automatically switch to council supply- keeping the supply to the households.
3. The council should also consider giving a interest free loans for installing Rain harvesting system to all Rate payers- that can be paid through their rates over 12-18 months (depending on the complexity of the system.
4. I should suggest to use a minimum of 3000L slimline tank (4000 Slime is better) , in private dwelling that have suitable empty space 5500L or greater should be considered.

   I suggest to wave any building consent on Rainwater harvesting tanks- from 1000L to 33000L- by doing so the ratepayers will appreciate that the council is looking forward to secure a better future to all.

5. The council should encourage- assist- each and every school to install a Rainwater harvesting tanks- for all toilets. All gardens and to encourage the return of Vegetables garden to each school.

   "As a small exercise – There are @ 68000 households Under the Wellington City jurisdictions area. If All shall install 3000L tanks That shall be more than 200,000,000L (two hundred million litters) that the Council does not buy- pumps to its reservoirs, pumps to every household- and its 200,000,000L that can be as a three day emergency water to each dwelling in case of a disaster."

By encouraging-promoting-doing it NOW the Wellington City Council can follow the other 4 councils around NZ that

Already carrying these measures, and showing a positive approach to secure a continuous water supply for all Future generations.

LETS DO IT-NOW!

Only Happy to support you –assist you-

Submission # 94

F Cook (email submission)

Introduction

The plan's move towards incentives rather than disincentives for demand management is a very welcome move and I hope marks the beginning of a move towards a sustainable and cooperative approach to the City's use of water. Also strongly supported is the move to work with other local authorities in the region on water use.

The introduction to the plan and the website summary (attached as an appendix) give a somewhat different impression to the thrust of the report, as does some of the analysis in Part One, taking a more negative and punitive approach to water issues. One hopes the report does signal a change in Council's thinking and approach to water issues.

Regulations

The plans for codes and regulations to include water use requirements and the development of indices for water efficient buildings and appliances is supported. Such an approach, which will need the support of other local authorities, can be based on voluntary measures in the first instance.

Council Water Use

That Council set an example with regard to its own water use is helpful particularly if done cooperatively with users and not imposed.

Leak Detection

The focus on leak detection is welcomed although expenditure recommended still appears too little. Not only do leaks incur ongoing costs they may also undermine soil stability, lead to damage of other distribution systems as happened in the Powerco outage, and hasten deterioration of the existing piping network. Leakage also increases roads and buildings susceptibility to failure.

'Free' Plumbing Service

This positive approach to leak detection and repair is supported, for both residential and business use.

Rainwater Tanks and Water Efficient Technologies

Advice and support for installation of rainwater tanks is another welcome initiative as is the provision of advice on water efficient technologies.

Other Initiatives

Other initiatives which should be considered for inclusion in the plan are

- The development of a 'water wise' program along the lines of the Australian model
- Greater involvement in schools, including support for the introduction of rainwater tanks, and assisting in the development of an education package to give a better appreciation of water issues and encourage greater care in its use
- Supporting the introduction of water wise plumbing courses
- Integration of the Wellington Water Charter into the plan, supporting its position on the importance of maximising and maintaining surfaces permeable to surface water
- Maintaining mulched areas within the drip line of Council trees both as an educative and a water conservation measure and introducing swales in parks as appropriate
- Publishing water usage figures in the news media as positive information - not focusing on historical maximum daily usage - and using intuitive definitions for terms such as residential water consumption. Feedback from the publication of a low flow chart indicated considerable interest and understanding of the water network and how it operates. Water, like the weather, is of considerable interest to much of the population.

Part One Analysis

The analysis is generally helpful and informative, but some aspects of the analysis involve cherry picking and are not representative. For example the focus on a peak increase above average use of 27% for one day in the summer of 2007-2008 is not helpful. A better approach is use a daily average over a maximum week as a measure of peak use. For example the Manners Mall spout last month could well have caused a spike in water usage for that day while the average daily use over that week would have smoothed out such spikes. The 1/02/2008 peak was on a Friday during a drought but the city's reservoirs can cope with spikes and one day's can be but is not necessarily typical of the week's usage rate.

I would also reiterate the fact that Wellington's average summer use is 26% of its annual use and winter use 24%. This represents a 1% variation from 25% per quarter and really renders inapplicable to Wellington the statement that universal water metering would reduce demand. It is useful to quote the Domestic Water Use Study done for the Water Corporation of Western Australia and published in 2003. "*A good understanding of domestic water usage patterns and trends is essential for the Corporation to effectively plan for the present needs of its domestic and other customers*." There, incidentally, summer use exceeded winter use by about three hundred percent. Compared to corresponding figure of eight percent value for Wellington underscores the need to focus on the Wellington situation and avoid general statements such as 'universal metering saves water'.

Also to be noted is Greater Wellington's move away from dams to the cheaper, environmentally acceptable and safer storage option of another lake.

Finally, on some of the specific questions:

- I think summer restrictions on sprinklers acceptable and am still concerned to see some people hosing driveways and paths to clear them of litter. Extension to cars and house sounds attractive but needs careful consideration before implementation.
- On the approach to water supply and demand issues I think education, information and consultation should be the primary tools.

I am not sure if there will be an opportunity to speak to my submission but if that is the case I would like to. I am also interested as time permits in studying the matter further and making further comment.

Submission # 95

C Davis (email submission)

Introduction

Water plays a key role in our personal health and the health of our environment but we often overlook that water issues go far beyond quality and environmental concerns. Water is also a key factor affecting our lifestyles, our economy and our society. It is also critical to supporting the complex ecological systems that enable life to exist.

Few would question that water is essential for life but in many respects we take water for granted and have come to expect that unlimited quantities of quality water will be available to us. Water is however a finite resource and there are growing concerns over diminishing supplies of water to sustain both current and future needs.

Population growth, economic development, and anticipated climate change impacts are increasingly putting pressure on the water supplies we currently have available in the Wellington region. These pressures will adversely affect our heath and well-being, our economy, and our aquatic ecosystems if they are not addressed in the near future.

The Wellington region is fortunate in that generally there is good rainfall (although not always when and where we need it) to maintain the rivers and aquifer sources from which we obtain our water supplies. However this does not mean we are immune from water shortages as whilst there is more than adequate rainfall during the low water demand period each year the surplus rainfall is not harnessed to carry us through the high demand dry periods.

In the past we have been able to manage demands on our water supply while maintaining a healthy environment because we had a relatively abundant supply to meet our needs. However the situation is changing and fluctuating and unpredictable water supply, and deteriorating fresh water quality, in recent years has highlighted the need to take greater care in how we allocate, use, and dispose of this finite resource.

Success in meeting water challenges facing the region will depend on good governance and a strong focus on water issues in the region, involving the community, industry, and local government working together to secure our water future. Finding solutions to address these challenges inherently brings about its own set of challenges, for example the challenge to change how water is perceived and how it is used.

There is no ‘silver bullet’ to address the regions water issues. What is needed is a multi-faceted approach that combines new sources, conservation and efficiency measures, and innovative ways of dealing with stormwater and wastewater to minimise impacts on the environment.

It is essential we get the balance right in our water planning to maintain our quality of life. If we fail to do so then not only will this impact on our lifestyles, we will also face significant economic and environmental costs.

Planning our water future

The community and water users expect their water supplier(s) to effectively plan for future water needs and provide efficient, cost effective services. This planning is particularly important when we face growing population and water demands, changing community expectations and supply conditions, and constraints due to finite resources.

Managing the demands on the water supply to ensure there is enough water for both economic growth and the maintenance of a healthy environment is absolutely vital to the future prosperity of the region. However managing demand through the use of conservation measures alone will not secure water supplies for the future. New or enhanced supply will be inevitable to compliment demand management measures for long term water supply certainty.

The very nature of the water cycle, which we affect by our water use activities, means that we need to take a holistic approach to water in our planning for the future. Our obligations to sustainably manage water will not be met if we consider water as several separate parts and activities, as they are all interlinked. This requires integrated planning across the broad range of water activities.

As all four metropolitan cities in the Wellington region take water from the regional supply this planning should be undertaken through a combined and co-ordinated City and Regional Council approach to the development of a regional water strategy. The significant water supply issues that need to be addressed in the near future are regional in nature, rather than local Council water issues. The supply issues affect all Councils and no one Council on its own can resolve what are essentially regional water supply issues, hence the need for a joint approach.

The regions local authorities have a dual responsibility to ensure that the regions water resources remain healthy whilst providing sufficient, secure water supplies to meet the reasonable needs of people and support a growing regional economy. This can only be achieved by all parties working in unison.

A proactive approach to planning for the future through the development of a long term regional water strategy should help to avoid future water shortages and reduce financial burdens and negative environmental impacts. The aim of a water strategy would be to effectively plan and manage water resources over the long term.

Planning on a long term basis would assist in delivering improvements cost effectively by developing sustainable solutions and making sound investment decisions. Developing sustainable solutions will also enable us to minimise the impact on the environment and minimise our carbon footprint.

Developing a long term water strategy would help address the challenges around climate change and water availability, sustainable management of water resources, growth and economic development, water conservation and water use efficiency, maintenance of lifestyles, waste reduction, fresh water quality, pollution and contamination avoidance, addressing aquatic degradation and impacts on the environment, integrated water and land management, etc.

A water strategy would identify key water issues and progress solutions for the current and future water needs of the Wellington region. The strategy would be intended to take a long-term view of a broad range of water matters in the region, taking into account the changing needs of the region and new challenges like climate change. A long-term strategy would aim to achieve the best possible environmental, social, cultural and economic outcomes for the region.

The strategy could provide a framework and guidance for decision making on key water issues and the management of those issues in the region over the next 30-50 years, with its chosen timeframe reflecting the longevity of water assets. It would assist in statutory regional and resource planning, and investment decisions.

Development of a strategy would also enable the opportunity to be taken to review how effectively we provide and use water, the demand on water services, the ability of existing infrastructure to adequately cater for these demands, and to assess whether the current levels of service provided continue to meet customer's expectations.

Challenges such as climate change and population growth now add a level of complexity to the ongoing provision of water services and present challenges that may require innovative or alternative means to ensure the unimpeded or indefinite provision of services. The strategy would need to be flexible enough to enable the region to adapt to changing circumstances and demands and continue to be effective in the provision of water services into the 22nd century.

It is suggested that the strategy take an integrated water management approach covering water, stormwater and wastewater services, freshwater, and the potential impacts on receiving water quality.

Drivers for development of a strategy

There are a number of key issues and challenges facing the region (note that whilst Councils Draft Water efficiency and Conservation Plan focuses on water supply, the issues listed below include items like wastewater flows due to the interrelationship between water supply and these other activities):

- Water availability
- Responding to population and economic growth and increasing water demand

- Supply and network resilience
- Aging infrastructure
- Security, reliability and system capacity of the water supply network
- Climate change impacts on supply sources limiting available supply
- More severe and frequent storm events putting strain on infrastructure and causing floods and slips
- Wastewater treatment and disposal
- Pollution of receiving waters and the environment
- Deteriorating water quality in streams, rivers, lakes and wetlands
- Increases in public expectations
- Legislative and regulatory changes
- Sustainability of our water supplies
- Environmental preservation
- Greenhouse gas emissions
- Affordability of solutions
- Governance

These issues present challenges that will need to be worked through to avoid undesirable impacts across the region. The issues have become the imperative for the development of a water strategy.

These issues do not stand alone from one another but are in many cases interwoven, thereby increasing the risks and challenges that the issues create. By taking an integrated approach to the management of resources and impacts in development of a water strategy we could aim to deliver prioritised solutions and benefits across multiple issues.

Water strategy

The water strategy would involve the investigation, options consideration and analysis, risk analysis, community engagement, issues resolution identification, options prioritisation, works programming and implementation, and progress reviews.

The strategy should be flexible enough to allow for monitoring and reviews to ensure it remains relevant and is able to be adapted to meet changing conditions. The strategy could be a progressive strategy with strategy initiatives able to be rolled out and implemented as needs arise.

The strategy could be expected to identify a mix of options for meeting future water needs such as demand management initiatives with a focus on improved water use efficiency, and additional sources of supply and potential infrastructure enhancements. The strategy should focus on making the best use of the existing water supply and sources as a first priority. Attention would then need to be given to additional sources to address remaining supply needs.

Work has already been undertaken on a number of infrastructure and demand management option assessments by the various Councils. Whilst this work could be incorporated into the strategy it shouldn't mean that any particular option or project has been endorsed at this stage.

Greater Wellington Regional Council (GW) has also, for some years now, been proposing a regional water strategy however this has not gained any traction. Current outputs from this proposal appear to be limited to a draft set of guiding principles.

It is imperative that progress is now made in preparing a coordinated regional water strategy, the longer it is left the greater the risk of compromising or missing out on viable and economic ways of effectively dealing with the regions water issues. Solutions to the issues need to be carefully planned for at the earliest opportunity so that they can be implemented in the timeliest and most cost effective manner.

It is unfortunate and disappointing that a long term plan for the management and development of the regional water supply isn't already in place. Such a plan could have avoided the reactive planning approaches now being considered, particularly around security

of supply issues. It suggests a failure on the part of GW to adequately carry out its obligations under the Wellington Regional Water Board Act 1972.

The seemingly disparate and uncoordinated approaches to the water supply issues facing the region, and the apparent lack of leadership to address this, appears to indicate that the current approaches to water planning are not working. It may thus be more productive for another body, such as Capacity Infrastructure Services - who already represents three of the regions Councils, to take the leadership role and drive the development and implementation of a long term water strategy for the region.

Strategy goals

In developing a water strategy it would be useful to set out the goals we would wish to achieve with the development and implementation of the strategy.

For example the objective of the strategy could be to ensure a sustainable water future in the Wellington region by:

- Providing safe and secure drinking water supplies for a sustainable economy
- Ensuring reliable, cost effective water, stormwater and wastewater systems
- Taking a region wide and integrated approach to water planning
- Undertaking timely allocation planning for future water sources to ensure regional growth is not compromised
- Review the current planning approach to consider existing levels of service and the impacts with higher levels of supply reliability
- Conservative and efficient use of our water supplies
- Planning and developing new water sources in a timely manner
- Allowing for potential climate change impacts in our water planning
- Balancing source development with demand management initiatives
- Coordinating conservation activities and efficiency incentivisation across the region
- Improving water use efficiency in all sectors
- Ensuring supply and infrastructure resilience to cope with shocks
- Protecting the value of our water resources
- Pursuing active catchment management strategies that enhance water quality
- Maintaining healthy aquatic ecosystems
- Ensuring the quality of all water resources is maintained or improved
- Developing a sustainable management framework for land and water use in the region

Regional water supply issues

The Councils Draft Water Efficiency and Conservation Plan discussion paper has a particular focus on water conservation; however there are numerous water supply issues in the region that suggest a much wider perspective needs to be taken to addressing these issues. Conservation activities alone, no matter how successful they may prove to be, will not address many of these issues.

Focusing on a singular key issue avoids the recognition of other interrelated issues, which to varying degrees are also important in developing balanced solutions to long term water supply security in the region.

The water supply issues are much more extensive than have been outlined in the discussion document. Some of these issues are already impacting on current supply availability, whilst others will have implications in the foreseeable future.

The following grouping of issues illustrates the extent of water supply issues that should be allowed for:

Increasing water demand

- Population growth

- Economic growth
- Climate change influences
- Urban intensification and housing styles implications on demand
- Commuter and visitor demand
- Planning for future demand

Water availability

- Security of supply standard
- Coping with seasonal peaks
- Harnessing the supply already available
- Lack of storage
- Resource constraints, minimum river flows and source water take limitations
- Climate change impacts on supply sources limiting available supply

Managing demand

- Balancing supply and demand
- A regional approach to demand management
- Sustainable and efficient water use
- Perceptions over the value of water
- Incentives for behaviour change
- Pricing signals – pricing for sustainability
- The economic and practical viability of demand management initiatives
- Community engagement
- The difficulty of obtaining conservation buy in by the community in a 'water rich' region
- Realistic and attainable water savings targets

Long term planning

- Taking a long term view
- Taking a multi-faceted approach with new sources, conservation and water use efficiency
- Short, medium, and long term options
- Infrastructure development plans
- Affordability of solutions
- Maintaining lifestyles
- Allowing for and encouraging economic development
- What does the community want?
- Increases in public expectations
- Maintaining levels of service
- Environmental preservation
- Governance

Integrated management

- Water supply and demand impacts on other services and the environment
- Integrated solutions across other affected activities
- Taking a region wide integrated approach to water, wastewater, stormwater and land use planning

Security, reliability, and supply resilience

- Building Infrastructure resilience to cope with emergencies
- Secure infrastructure and services
- Source of supply and network resilience
- Security, reliability and system capacity of the water supply network
- Aging infrastructure
- Restoration after disaster- disaster recovery
- Supply Risks

The issues above are not an exhaustive list but simply illustrate that there is an extensive range of water supply issues to be accounted for. They are generally interlinked and need to be considered holistically in developing solutions for the regions water supply future. The issues are simply headings and of course within each issue there are many facets.

The point to make here is that if we are to develop sensible and robust water supply solutions for the region then we need to take into account all these issues. There is a level of complexity in producing economic and viable water supply outcomes for the long term and unless we take into account the wide range of issues we could finish up with compromised and unsatisfactory outcomes.

A cursory look at these issues suggests that demand management alone will not be sufficient address the wide range of issues, nor will it secure water supplies for the future. It seems clear that a multi-faceted approach with new sources, conservation and water use efficiency will be necessary to deal with these issues.

Security of supply

It is apparent the Council is tending to focus on conservation, with less emphasis on medium to long term options to address security of supply issues and secure future water supplies in the region.

Whilst GW has considered options to address security of supply its focus has largely been on simply restoring the security of supply standard from the current 1 in 26 year security standard back to the previous 1 in 50 year standard (2% security of supply standard). The standard has declined over recent years due to population growth. This approach is little more than restoring the status quo. There is a however a strong case for reviewing the standard and determining whether the 1 in 50 year standard remains appropriate for the future, given potential climate change influences on future water supply availability.

However security of supply is far more than just having enough water for population growth, or the economics of its provision; it's also about ensuring our water supply infrastructure is resilient to shocks and adaptable to future changes and needs. An essential aspect of security of supply is also having resilient infrastructure and being able to quickly restore supplies to support life, public health, and the economy after a seismic or other damaging event.

A good illustration of supply resilience and restoration planning is the recent study undertaken by GNS of the 'Impacts of a Wellington Fault Earthquake on the Wellington Regions Bulk Water Supply' The modelling carried out in the study indicated that it is likely to take 5-8 weeks to restore the water supply to Wellington from the current supply sources. Modelling showed that having the Whakatikei Dam could reduce restoration times down to 3 weeks before water could be again supplied into Wellington, clearly illustrating the benefits of proactive supply resilience and restoration planning.

The cost to businesses of being without water for over three weeks, let alone 5-8 weeks, is likely to run into hundreds of millions of dollars; far more than the cost of a dam. The inference from this is that there are much wider economic and community considerations at stake than just the initial capital cost of a dam.

Security of supply may mean we need to build in spare capacity and supply redundancy, and allow for diversity in how we supply water particularly during adverse events. These are all aspects, together with climate change impacts, that don't appear to have been addressed by GW's current supply augmentation proposals, or Councils own proposals, even though they are very pertinent to long term water supply security in Wellington.

There is a case for securing the long term water future of the region for economic, population and demand growth, and climate change reasons. This will most likely require new source development in parallel with demand management strategies. Simply aiming to defer the development of new water sources in favour of water conservation measures, where there is no certainty these measures will be embraced by consumers in a region that appears to have plenty of water available, may not be the best approach to securing water supplies for the future.

As the above aspects don't seem to feature in the Council's proposals it would be desirable for Council to take a more comprehensive look at all the factors that need to be considered in a long term approach to securing a sustainable water future for the city.

However before this can be done it is essential that GW prepares a comprehensive cost effectiveness analysis of supply augmentation options which has a wider focus, beyond restoring the security of supply standard and catering for population increases. The analysis needs to consider factors like climate change, resilient infrastructure, early restoration of supply, long term security of supply etc.

There is considerable investment at stake with both supply augmentation works and demand management measures. It is therefore essential that the full consideration is given to all the known issues that will impact on the ability to supply sufficient water into the foreseeable future and strike a balance between the options available to us. There is a need to focus on the bigger picture and what's best for the long term.

Information available from GW to date on supply augmentation options does not fully cover the range of issues that need to be considered, and therefore further analysis by GW is a vital prerequisite to any decisions on a demand management strategy.

Population

This is being promoted as the driver for demand management. However there is not a precise correlation between population growth and increasing water demand as demand is affected by a number of factors in addition to population growth such as climate, economy, household types, seasonal weather, etc. Demand will also vary across the region depending on housing density and styles. For instance Wellington city's predicted future development of 1/3 apartments, 1/3 infill style housing and 1/3 greenfeilds type residential development may influence demand more that total population growth.

The inference from the discussion document is that demand management will fix the regions water supply for some time to come. Also GW seems to be saying that restoring the 2% security of supply standard will be sufficient. It is a huge stretch of the imagination to envisage demand management activity being able to restore that standard, without even contemplating the ongoing water demand increases due to population growth, economic growth, etc.

Clearly no matter how successful any demand management initiatives are there is a finite limit to the water savings they can generate and the growing population and the associated water demand will soon outstrip those savings. The risk is that relying solely on demand management over the foreseeable future, as has been suggested, could mean that we finish up being unable to meet summer demand and then having no time to develop and implement other remedial measures.

Demand Management

This seems to be being promoted as the 'silver bullet' to solve water supply issues and defer major capital expenditure on infrastructure. There is no certainty that the community will buy into or support this, that individual councils will wish to pursue this as the preferred option, or that the required savings will be realised. A real difficulty for the region is that there is no apparent supply crisis, there is an abundance of rainfall, and there is no financial or other incentive for most consumers to change their attitude to water and its use.

Before investing in large sums on conservation initiatives it will be absolutely essential to engage with the community based on the provision of full information to enable the community to be able to weigh up the options in a balanced and well informed manner. We need to ascertain what the community wants; they may not wish to reduce demand or change their lifestyle and may be happy to fund the extra cost of having a more secure and future-

proofed water supply. Unfortunately a lot of assumptions are being made in the absence of knowledge of the community's desires.

Obviously a balanced approach of both supply sources and demand to achieve robust long term outcomes will be necessary. Blundering into short and even longer term solutions on the basis of single solution approach, which may not even be palatable with the community, will not be in the community's best long term interests.

Community engagement

At some point there is a need to fully engage with the community to gauge the community's attitudes to factors like their tolerance to water supply restrictions, acceptable levels of service, the construction of dams vs restrictions and demand management measures, water metering, etc.

An essential pre-requisite to this engagement is the raising of the communities understanding of water supply issues in the region, and the recognition of the need for the community's action and involvement in the solutions. To do this we need to also provide comprehensive information in a simplified form to the community.

Currently the communities' understanding is limited to various incomplete media articles over the past year or so and Councils recent discussion paper. Often this media coverage has been misinformed and has dealt with single issues or reflected the viewpoint of individuals which are often biased, such that the community has not seen balanced reporting of all the issues and potential solutions.

Unfortunately the Council discussion paper falls short of improving this situation as it has a relatively narrow focus on just a few conservation measures, provides very little information on the regional water supply issues, and does not discuss the wide range of options that could be pursued to augment supply or manage demand.

There needs to be a determined effort by Council to address this in the very near future by fully informing the community of all aspects in a neutral and open manner, clearly setting out all the issues and possible solution options for the community to weigh up and provide feedback to Council.

To gain community 'buy in' and participation Council needs to:

- Fully inform the community to raise awareness of water supply issues
- Raise the level of community understanding of why water saving is necessary or desirable
- Show what Council is doing to be water efficient in its activities
- Fully engage with the community
- Promote the 'why' and 'how' to conserve water with an emphasis on water use efficiency
- Council taking the lead and demonstrating its commitment to water savings and sustainability
- Build on existing water efficiency measures and promoting Council's achievements

Most water saving measures rely on behavioural change; changes that take a long time to bring about. If we wait for demand to reach certain trigger points, before implementing measures reliant on behaviour change, then meters will be unavoidable as a means of deferring a dam. This is simply because the behaviour change savings won't be realized quickly enough.

However if there is no appetite for meters then the dam design needs to start in 4 years time (2014, or possibly sooner dependent on the outcome of the Kaitoke weir consent and the success of production testing of the Upper Hutt aquifer).

In some respects proceeding directly to a dam would save the capital cost of meters (about half the cost of a dam) and may be a better alternative in terms of future proofing the regional water supply; although there are distinct benefits of meters in terms of charging equity, leakage and wastage reduction, and water use efficiency.

Essentially Council and the community have 4 years to progress water savings before the crunch decision time of 2014. That means it needs to proceed now with water saving measure promotions, ahead of any trigger point driven measure implementation.

A significant amount of effort will need to be put into behaviour change tactics fairly quickly given the 4 year horizon. Substantial water savings will have to be made to negate the need for meters and this could prove difficult.

It would also be useful to embark on a social marketing campaign at the time of the community engagement. This would help get the community involved in the 'problem', recognising their part in it and participating in its resolution. The outcomes of this will dictate what further demand management measures and supply augmentation actions need to be implemented.

Council needs to be ready to roll out demand management measures, most probably aligned to financial incentives, once the engagement result is known.

Climate Change

Climate change may have significant potential to affect water supply sources and needs to be factored into evaluations of the adequacy of supplies to meet future demand. It also has potential to dramatically change patterns of demand, and could therefore be an important consideration in demand projections. Changes in the nature of supply and demand would necessitate infrastructure adaptation. High cost and relative uncertainty make these adaptations somewhat problematic.

Supply augmentation scenarios

GW has proposed a number of supply augmentation scenarios. It is clear that a decision on which long term options are to be pursued will need to be made within the next 4 years and without metering or generation of equivalent water savings by other demand management measures a dam will be required by 2022 with design commencing within 4 years from now. This is a very short timeframe in which to bring about sufficient behavioural changes to generate the 15% water savings required if the dam is to be deferred till 2040.

Further study is ongoing by GW on these scenarios, e.g. the seismic response benefits of the Whakatikei dam, and further studies on the raising of the Te Marua lakes. Until the outcome of the various further studies is available consideration of any particular scenario should only be tentative at this stage. Full analysis and reporting on all the available options is a necessary prerequisite to informed discussion and debate on future source water supplies and demand management initiatives. Reporting across the regions TLAs has been fragmented to date with no comprehensive reporting covering all the wide ranging issues on security of supply, supply options, and possible demand management initiatives having been considered either separately or jointly in the region. This consideration is vital to reaching sound decisions for the regions future water supply.

Accordingly it would be unwise for Council to venture into significant new demand management initiatives before a full analysis is made of supply augmentation and demand management options is undertaken. As discussed above a multi-faceted approach to regional water supply issues is required, this means a region wide and balanced look at possible options, rather than simply a focus on conservation measures. Development of a regional water strategy would seem to be the most effective way of planning to address the regional water issues. The strategy would then determine the required actions and their priorities.

Private storage facilities - rainwater tanks

There has been much talk of private individuals developing water storage facilities through the use of rainwater tanks as a means of solving the regional water supply situation.

Whilst some individuals are motivated to install rainwater tanks there are associated installation and pumping costs, site and practicality issues that can detract from widespread adoption of rainwater tanks. From a community perspective individual rainwater storage installations are very expensive. As an example:

> *If the 130,000 properties in the region put a 2000 litre tank on their property then the cost at approximately $2,000 per tank would equate to $260 million.*
>
> *The water it would store would be 260 million litres. (In a drought the rainwater tanks are unlikely to be full and a 2000 litre tank is relatively small; larger 25,000 litre tanks are typical in rural communities). Larger tanks would cost considerably more.*

The Whakatikei Dam has been estimated to cost $140 million; nearly half the cost of those rainwater tanks. The Whakatikei Dam would store 8,400 million litres (32 times as much).

Cumulative individual costs and water quality aspects have been the driver for adopting community based water supply reticulation schemes over the history of water supplies worldwide. This is unlikely to change in the future even though there may be a move towards recycling for non potable water purposes by some individuals. Wide scale community adoption of rainwater tanks is not a viable or cost effective means of solving regional source of supply and security of supply issues.

Water pricing and metering

The topic of water metering seems to be controversial in some quarters. The issue in Wellington with water metering is that neither Council nor the community has been presented with an in depth analysis of the benefits or otherwise of universal metering. Most discussion on metering seems to centre on perceptions formed through a lack of factual knowledge.

Despite pessimism by some it has been clearly demonstrated in NZ and internationally that water pricing and pricing for sustainability is a key component in managing water demand.

One of the biggest blockages to successful demand management is the failure or unwillingness to address water pricing. Pricing reinforces the true value of water and supports efforts to save water.

In many cases around the world excessive water use is attributable largely to low water prices which prevented the development and wide scale installation of technologies which reduce water demand. Excessive water use also tends to lead to overcapitalisation of water supplies in trying to meet demand.

In situations of water scarcity, demand management has been shown to be effective when exercised through the proper pricing of water, together with or as an alternative to conventional supply management practices. Conservation based water pricing is central to efficient use of water and a sustainable water future. Through best practice pricing, economically efficient and sustainable use of water resources will be promoted, which will in turn reduce demand on water supplies.

Water prices convey important signals to customers about the value of water, the cost of water provision and the impact of demand growth on supply costs. Having an understanding of the value of water assists in people acknowledging they have a responsibility and a need to be accountable for their water use.

Getting water charging right is therefore critical to ensuring that water is used wisely and that new sources of water supply are developed in a timely fashion. The right mix of demand management measures, pricing and water efficiency is essential for ensuring supplies in times of low water availability.

Wellington has an average pricing method which has an under and over users impact. Average pricing penalises under users, but rewards over users of infrastructure such as pipes, pumping and reservoirs. In effect this means that those that make efforts to conserve water are in fact subsidising the more profligate use of other users.

One of the distinct advantages of meters is that it provides a more equitable user pays mechanism dictating water usage according to the user's willingness to pay.

Pricing for sustainability requires usage to be measured and therefore universal metering becomes a prerequisite of a sound pricing strategy.

From a business perspective it's difficult to manage what you can't measure. Measuring requires metering and to measure all usage in Wellington would require a move to universal metering in the city.

One of the most significant deterrents to addressing water wastage and private leakage in Wellington is that where there is no user pays mechanism in place householders are not worried about wastage or leakage, simply because there is no price penalty for allowing the wastage to continue.

A significant benefit of metering that is often overlooked is that meters assist in detecting leaks on properties, both indoors and outdoors. It is widely held in the water industry that the

greatest proportion of water leaks is on private property and these leaks generally go undetected without meters to highlight the leakage.

Measurement of usage with universal metering raises awareness for householders of their actual demands on the water supply systems and is effective in reducing water consumption because it allows customers to track the amount of water they use. This leads to action to reduce their demand whilst at the same time reducing their financial outgoings.

The merits of metering are generally well understood but decisions on metering should only be made after a careful analysis of the benefits and costs of a universal metering strategy for Wellington. The full potential of universal metering to address security of supply would require universal metering to be implemented across all four cities in the Wellington Region within a similar time frame. To date the concept of universal metering has not been fully appraised.

The installation of universal metering is gaining momentum in New Zealand and overseas in recognition of the role of meters and conservation tariffs in promoting more efficient water use.

It seems likely that deferral of a dam would require metering to achieve the required water savings. Construction of a dam now would avoid the need for universal metering but metering is still useful for charging equity, water use efficiency and sustainability reasons, and as discussed above pricing in conjunction with measurement is central to the efficient and sustainable use of water for the long term.

Metering needs to be evaluated in the context of achieving a sustainable water future, and not seen only as a short term measure to avoid or defer the need for supply augmentation.

If Council was to contemplate universal metering, then any debate and community consultation on metering should be on the basis of careful analysis and well communicated information.

Metering Perceptions and tariff structures

The topic of universal metering engenders mixed, and frequently negative and emotive, reactions from the community. This may be partly due to a lack of informed information about the rationale for implementing universal metering.

The three dominant reasons expressed against metering are privatisation, increasing Councils revenue and disadvantaging the poor.

Of all the locations metered by councils in New Zealand, covering about 40% of the urban population in New Zealand, none of these water supplies are privatized. The Local Government Act 2002 expressly prohibits Council water activities being transferred to any other party than Regional Councils. In the UK there are many private water companies which do not have water meters installed.

With regard to meters being a revenue earner for Councils, metered water tariffs are generally set on a supply cost recovery basis with tariffs in some areas having tiered structures to reflect the additional cost of peak water demand. Invariably the same amount of water supply revenue is generated with metering as would be with a water rates charging method.

Metered water tariff structures can be readily tailored to ensure large families or the poor are not disadvantaged. Some water authorities use a baseline water allocation funded by rates with an excess use charge depending on actual usage. The Victorian government tariff structure outlined below illustrates how safety nets for customers who are legitimately high indoor users (e.g. large households) can be shielded from large bills by a relatively minor increase in the price of the second tier of their tariff structure.

Development of well thought out tiered tariff structures that send pricing signals to consumers to encourage water efficiency and also accommodate legitimate high indoor use by low income consumers would be a key part of any metering strategy.

Undertaking an analysis of tariff structures and developing example water bills for a range of representative household types to demonstrate the likely impact on those households, and communicating this to the community should allay fears over metering.

A conservation-driven pricing system would have a number of key features:

- it would encourage conservation (an inclined block tariff structure does this)

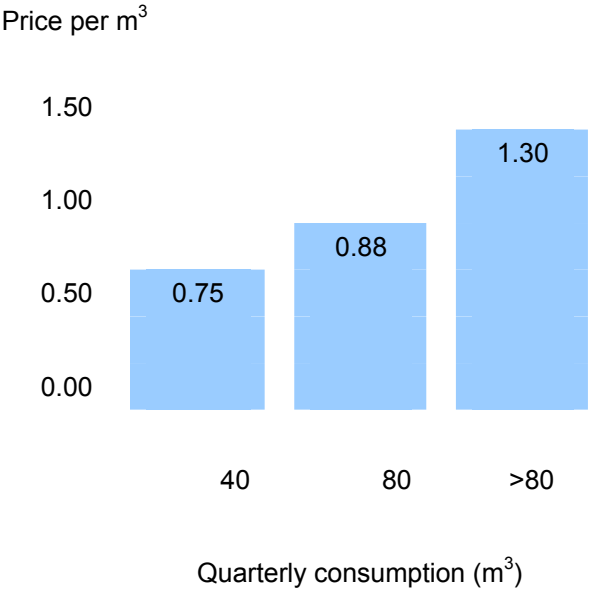
- the pricing signals would be timely (monthly or two monthly meter reading, not six-monthly or annual)
- it would be easily understood by consumers (a two-tiered structure is commonly recommended)
- it would be fair (poorer consumer groups are not disadvantaged as their outdoor and discretionary use is not usually high and they can see significant savings by careful use of water).

Whilst there is a range of tariff structures that can be used in charging for metered water, the focus in Wellington would be on tariff structures that provide incentives to use water efficiently and conserve water. The rising block tariff which has several tiers in which the tiers become progressively more expensive is the most suitable for this. This is intended to incentivise reductions in usage.

An example of this type of structure that would suit application in Wellington is demonstrated by looking at the tariff structure in Victoria, Australia.

The rationale for Victoria's tariff structure is to encourage all consumers to conserve water and to consider alternative, sustainable sources of water.

Their structure is a three-tier rising block tariff.



Rising block tariff for Melbourne

The block tariff provides for increased incentive for customers - especially those who use larger volumes of water - to use less.

The tariff has a set price of 75 cents per cubic meter (m^3) for the first 40 m^3 of water used per quarter, 88 cents/ m^3 for between 40 and 80 m^3 per quarter, and $1.30 for every m^3 over 80 m^3 per quarter.

In setting the block levels the Victorian Government aimed to:

- protect vulnerable customers by providing relatively low cost access to a quantity of water (40 m^3 per quarter) equivalent to 'average' indoor usage;
- provide an adequate safety net for customers who are legitimately high indoor users (e.g. large households) by applying only a relatively minor increase in the price of water in the second block; and provide a significant conservation incentive to customers who consume water in the third block (where usage is more likely to be discretionary)
- Whilst the actual tariff steps would need to be tailored to Wellington prices a similar tariff structure could be adopted for Wellington.

The key to this structure is that it gives pricing signals that should encourage conservation but also provides moderate tariffs at the lower end to protect vulnerable customers.

Metered water customers in New Zealand are mainly charged on the basis of single flat rate structures that do not provide increased incentives for customers to use less.

Comments on the discussion document

Overall the discussion document has a considerable focus on water restrictions as a demand management tool. The other areas of focus include supply costs, storage shortfalls, and the implications of a dam and meters and tariffs. However these topics are not covered in the context of the bigger picture or the range of measures that could be available to Council to augment supply or manage demand.

The introduction to both part one and two mainly refers to likely shortfalls in the future between supply and demand, without giving any real background information or an introduction to the regional water supply situation and issues.

Surprisingly there is no substantive discussion on what the issues and challenges are for the regions water supply, what Councils aspirations are, and what options have been considered to date in planning to address the challenges. There is no indication of what the population projections are for the future and what affect this and climate change might have on water supply availability now or into the future.

The limited and narrow focus of the discussion document avoids the recognition of other interrelated issues, which to varying degrees are also important in developing balanced solutions to long term water supply security in the region. The range of issues impacting on the regions water supplies is much more extensive than the few covered in discussion document. Some of these issues are already impacting on current supply availability, whilst others will have implications in the foreseeable future.

Council can't assume the community is knowledgeable about the current situation and issues, or the challenges ahead of us and the options that have, or are, being considered to address the issues.

Any consultation with the community is destined to fail unless Council clearly sets out the issues, challenges and possible means of addressing these. A key factor in the consultation is raising the community's awareness, getting them to think about the issues and possible solutions, and most of all getting then to recognise and take ownership of the problem they are part of.

If Council doesn't adequately share the problems with the community and seek their views on a range of possible actions the community would like to see pursued it is missing a vital opportunity to achieve community buy in to the sound planning of the regions future water supplies. This is particularly important to the success of demand management measures, most of which are totally dependent on community involvement and support.

Part one of the discussion paper simply asks for community feedback on the use of water restrictions.

Questioning the community on the use of water restrictions will probably produce a negative reaction from those that wish to maintain their garden investment, whilst those without gardens won't be concerned as garden watering restrictions will have little impact on them. Apart from complying with the restrictions there is no positive community participation involved in this measure as it has negative and restrictive connotations.

Reliance on water restrictions to manage demand will not secure water supplies or provide a long term solution to increasing demand or climate induced water shortages. In many ways the community could see this as a "do nothing option" by Council. Council won't be thanked for taking a wait and see approach, that relies on reacting to water shortages through the imposition of water restrictions, when proactive forward planning could have avoided the need for such restrictions and reductions in service levels.

A demand management strategy based around water restrictions to curtail demand will certainly not help in promoting economic growth in the city, nor will it assist in maintaining lifestyles.

A wait and see approach has the risk that it will then be too late to implement robust solutions to ensure ongoing supply certainty. This is because infrastructure solutions will take years to

implement, and demand management initiatives that rely on behaviour change also take considerable time to generate the required water savings.

Water shortages experienced in recent summers, and the prospect of further water shortages in the future due to population growth and climate change impacts, suggests we need to do more than simply react to shortages as they occur, by the imposition of water restrictions.

Increasingly severe water restrictions are normally only imposed on communities by Councils as a last resort due to an inability to maintain the normal level of service, often due to supply and capacity issues arising from forward planning shortcomings.

Clearly Council needs to obtain feedback on a much wider range of regional water supply issues and options than just water restrictions.

Part two seeks feedback on the suggestion that Council focus on efficiency and regulatory measures, but apart from a fairly cursory mention it does not discuss these measures and what savings or benefits could be expected from their use. The key questions in Part two relate again to water restrictions, and the use of efficiency and regulatory measures.

Part two also has many statements prefaced with "we will" which suggest Council has already decided what demand management actions it intends to implement. This could negate community feedback on the basis *…."that as the Council seems to have already decided then what's the point now of consulting us for our feedback".*

In my view the very restricted questions being asked and the "we will" approach is a completely inadequate basis on which to engage with and obtain appropriate feedback from the community.

Remarkably the views of the community on sources of supply, security of supply, supply augmentation vs demand management, sustainability, desired levels of service, planning for the future, supply and climate resilience, etc. are not being sought. The feedback being sought has been primarily centred on water restrictions.

Water restrictions and demand management alone will not secure the regions future water supplies. Council has a duty to engage with its communities in a way that fully shares the existing situational knowledge, outlines the issues and supply challenges, and the possible solutions that could be adopted to secure the regions water future.

My overriding concern is that the discussion document doesn't provide an informed or balanced discussion on which the community could make any reasoned assessment of the issues to give meaningful feedback. I feel that Council needs to present the community with a more holistic view of the regional water supply situation and its current and future challenges, and therefore the following comments cover only some aspects of the discussion document rather than providing detailed comment on the discussion paper. The comments below should nevertheless be indicative of my concerns:

- <u>The community needs to act now, not at some point in the future</u>. The current population has already exceeded the population that can be sustained by the bulk supply.
- Some short and medium term supply augmentation options have been proposed by the GW for very early implementation to address supply issues that are already prevalent. There is no mention of these options in the discussion paper.
- The references to "onerous" demand management options aren't helpful. None of the options are in fact onerous; they simply require carefully planned implementation. Of course they all involve some form of financial outlay, which is a very good reason why a balanced discussion and presentation is made to the community on the range of options that could be implemented.
- The discussion doesn't endear the reader to carry on reading as it only provides snippets of information rather than painting a picture of the water supply situation and what Council and the community could do to address that. There is no substantive discussion or argument in the discussion document to encourage the engagement of the community in developing solutions with Council.
- There is inadequate discussion on both supply and demand options that have or could be been considered. The public needs to be presented with a balanced discussion on the options and their likely costs. Instead there is a strong focus on three options…dams, meters and restrictions. The discussion on these is not balanced, with much of it in a negative context.

- The most important aspect of all this is that unless Council gets the consultation right it will fail to get the outcomes it needs from the community. Unless that happens, and Council gets the Community behind it, then reducing demand will be extremely difficult and too late to address the current supply issues in an economic and effective way.

Key points

- Population increases aren't the only drivers
- Security of supply and supply resilience are equally important
- The issues are wide ranging requiring a comprehensive approach to the regional water supply
- A long term planning focus is required
- A regional approach is necessary which can be actioned through the development of a regional water strategy
- Community engagement and social marketing is required to encourage the behaviour change necessary to bring about water savings, this is vital to community buy in
- Council needs to set some water savings targets for the community to aspire to
- A wait and see approach relying on water restrictions is not a sustainable approach and won't be supported by the community in the long term
- Conservation alone won't solve the issues, it needs a balanced approach between supply augmentation and demand management initiatives
- Water metering has a range of advantages and there needs to be informed discussion on water metering
- Rainwater tanks are not economic on a community wide basis
- The key decision point is in 2014, this gives just 4 years to achieve significant water savings
- The level of savings achieved by then will determine the decision on meters and the future timing of a dam
- The community needs to act now, waiting could mean missed opportunities, less economic solutions and supply augmentation difficulties

Submission # 96

J Morrison (email submission)

Comments on the Draft Plan

General Comments on Wellington's water supply:

The system for the supply of water to Wellington City is unique. Consequently comparisons with water conservation solutions adopted in other cities may not be at all relevant.
The unique features include:

- The responsibility for supplying bulk water to the main city connection points, as well as for the planning and implementation of associated capital works, rests with a separate authority, the Wellington Regional Council.
- The Regional Council supplies water to three other cities, with the overall annual cost of bulk water being shared between the four cities in proportion to consumption.
- The bulk water levy contains a very high fixed component and low variable component. Consequently, reductions in consumption only produce very small cost savings.
- Water to the city comes from a combination of three river sources and an artesian aquifer. These sources are interconnected and are all used in conjunction.

- Water drawn from reasonably sized remote rivers with "run of the river" intakes at Kaitoke, Wainuiomata and Orongorongo. Long pipelines connect these sources to the city.
- The only storage in the system is the two Stuart Macaskill Lakes at Te Marua.
- There is a high yielding aquifer at Waterloo Lower Hutt.
- Wellington has a temperate climate with regular rain throughout the year as well as drying winds.
- Most of Wellington city has low permeability (clay) soils.
- There are a relatively large number of apartment dwellers and concentration of commuters to the CBD.
- The hilly topography leads to larger water pressure variations at consumers taps.
- There is a lot of ageing but well interconnected pipework in central suburbs.

All of these features must be taken into consideration when deciding what if any water conservation measures should be implemented.

2 Comments on the proposals suggested in the draft plan

2.1 Conservation and the efficient use of water is a worthwhile goal for Wellington City. However consideration has to be given to the cost of any measures adopted relative to any actual savings achievable.

If the aim of reducing consumption is to defer bulk water capital works, this may not be the outcome, as the responsibility for the capital works rests with Wellington Regional Council. Additionally, because of the current method of charging for bulk water, a reduction in consumption by one city could actually produce an increased cost, if another city reduced consumption by a greater extent.

2.2 I support the proposal that the availability of water supply to residents should be adequate to meet the demand arising from a 1 in 50 year drought, with the existing restrictions in place.

In relation to the specific conservation proposals, my comments are as follows:

2.3 In my view, the greatest long term water efficiency would come from the mandatory installation of dual flush low volume toilets and low volume shower heads. I understand that because of the provisions of the Building Act, the Council is unable to enact By Laws to make these compulsory. Council should do all in its power to lobby for a change to this totally inappropriate aspect of the law.

2.4 However if a law change is not possible, WCC should work very closely with plumbing suppliers to ensure that inappropriate fittings are not for offered for sale on a voluntary basis. Additionally WCC should lead by example to ensure that all plumbing fittings in all facilities under its control have the highest levels of efficiency.

2.5 Rain water collection and reuse is offered as a proposal. My view is that a rain water tank may of value in an emergency, when the supply of water from the city supply is unavailable. I do not favour subsidies for these tanks, as the benefit of installation is to the house owner. These tanks are sometimes suggested as a means of minimising peak water flows in the stormwater system. A simple calculation shows that they have no impact at all in this regard.

2.6 Grey water collection is also mentioned. This water cannot be stored as it turns septic, and has to be put on the garden. This would possibly be a means of watering the garden in an extreme drought, when all outside use of water was banned, but collection by bucket in that situation would also be possible.

2.7 I feel that the existing hosing restrictions should be publicised to a greater extent, and be enforced at times of peak demand.

2.8 Because a significant part of the summer increase in demand arises from water uses outside the house, with much of it used for garden and lawn irrigation, there is scope for education campaigns on this aspect. As noted in the document, demonstration gardens could be established in various public gardens to illustrate the techniques which allow successful low water demand gardens to be established. This technique is called Xeriscape landscaping. In addition, Council should work with landscaping suppliers to promote the availability and use of low water demand grass species, to be used for new or replacement grassed areas.

3 Other Issues.

The consultation document asks for comments on how Wellington should approach water supply and demand issues in the future. My comments on this important aspect are as follows:

3.1 The supply of water to Wellington city comes from sources a relatively long way away, and on the other side of the Wellington fault. The trunk pipelines cross the Wellington fault in several locations. These locations are shown in the map attached to the Discussion document.

3.2 The probability of a rupture of the Wellington fault is about 10% in 100 years, or an 850 year return period. Note that this is the reduced probability following a recent detailed analysis. However despite this change for the better, the risk is still significant. A rupture of the fault will produce an earthquake of magnitude 7.5, (compare Christchurch 7.1) with the west side of the fault moving north about 5 metres, and the east side down about 1 metre.

3.3 The bulk water pipelines which cross the fault will be severed in the following locations: Te Marua (several crossing points) , Silverstream bridge, Karori reservoir, Tinakori Road, Korokoro at the Petone foreshore including a drop in ground level and liquefaction, and in the Thorndon Quay/Hutt Rd/Tinakori Rd area.

3.4 The extent of damage arising will depend on various factors, including the orientation of the pipe to the fault. The pipelines are typically about 1 metre diameter and are constructed of thin steel shells with concrete linings.

3.5 Repair times will be very long, and complicated by the need to establish vehicle access and to reconnect other lifelines in the same locations, as well as the availability of reinstatement resources. Bulk water supply may not be available for some months. The impact of this situation on Wellington City and on the New Zealand seat of government will be immense, both from a social and economic viewpoint.

3.6 At present there is a unique opportunity to both ensure an adequate supply of water for the region and its growing population, as well as giving significantly enhanced security to the supply of water.

3.7 The construction of the Whakatikei project, which includes a dam, water treatment plant and outlet pipeline is the obvious solution to these ongoing deficiencies in the bulk water supply network. The concept for this project was established in the 1920s when land was acquired for this purpose.

3.8 The project is seen as being an inevitable requirement in the future. However my assertion is that planning and investigations should be commenced now, so that the project can be brought into service as soon as possible.

3.9 Because the project is located to the west of the Wellington fault, the outlet pipeline can connect into the existing pipeline from Te Marua to Karori at Judgeford. The water flow therefore would not cross the Wellington fault, and any repairs required to re-establish flows from this source after the rupture of the Wellington fault would be relatively minor. Water supply could be re-established very quickly to all of Porirua, Tawa, Johnsonville, Newlands, Churton Park, parts of Khandallah and Ngaio, Wilton, Wadestown, Karori and Northland. Some relatively straight forward pipe repairs at Karori would allow water to flow into the southern end of the CBD and also to Wellington hospital.

3.10 The economic value of this much earlier supply of water to the city has been valuated by Business and Economic Research Ltd (BERL). Their report is referenced on page 14 of the Discussion Document. The full report should be made available and explained to Councillors.

There are other additional issues to be taken into account when considering the construction of the Whakatikei project:

3.11 Section 60 of the Civil Defence Emergency Management (CDEM) Act 2002 defines the requirements on Lifeline Utilities as follows:

60 Duties of lifeline utilities

Every lifeline utility must—

(a) ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency:

(b) make available to the Director in writing, on request, its plan for functioning during and after an emergency:

3.12 The design requirements for forces that existing and new structures must be able to withstand are defined in the various building codes and enforced by the Building Act. The probability of an event occurring that would give rise to these forces is a similar probability to that of a rupture of the Wellington fault. However the anomaly is that enforcement of the Building Act gives security to the public that structures will survive events with this probability, yet Councils can make their own decisions as to the level of security of vital lifelines, and accept a lower standard, which affects the survival of the whole community, rather than just a particular structure.

3.13 The construction of the Whakatikei project will also provide additional security of supply in normal operating situations, by allowing other sources to be taken out of service for occasional major upgrades which will certainly be required in the future.

4 Conclusion

My considered opinion is that at this time the community has a unique opportunity to ensure that the region has an adequate secure water supply system for the decades ahead. Wellington City Council should therefore apply pressure on Wellington Regional Council to ensure that the Whakatikei project is treated as a vital facility that must be brought into operation as soon as possible, so as to increase the level of the security of the water supply to Wellington City and the region to an appropriate level.
I wish to be heard in support of my submission at the hearing, so that I can further explain the points which I have outlined above.

Submission # 97

Seth Hickling (email submission)

I will keep my submission short and relatively simple - not just because I have been busy on other fronts. I have spoken with Paul Glennie at length about the Draft Plan and I understand the enormity of the challenge of managing Wellington's water - supply and demand, but I believe that as complex as Wellington's water issues are, the core solution to these issues is quite simple.

And it goes further than just the management of Wellington's water resource and infrastructure. I believe that what Wellington City Council really needs to do - to manage Wellington's infrastructure, services and resources more efficiently and effectively (and sensitively) is to speak out powerfully to the people of Wellington's - its households, communities and businesses to impress upon them the importance of these issues and the importance of them getting involved, informing themselves in respect of these issues and doing something towards address these issues for their own benefit at an individual, household or business level and for the benefit of their community and of Wellington.

I want to see provision in Wellingtons Water Conservation & Efficiency Plan to fund and support a well considered sure to succeed public engagement plan that really deeply moves Wellington residents to recognise the importance of water to them, a plan that involves giving them information, advice and support to get involved in water management at individual, household, business and community levels.

I think this is the biggest thing missing in the Councils draft plan – a sure fire plan and a real commitment to a plan that engages businesses, communities and households on water issues, encourages and empowers them to do what they can to make a difference for themselves and others.

I would like to see provision in the Water Conservation & Efficiency Plan for a public engagement plan/program that reaches out to Wellington residents, engages and educates them on water issues by way of promotional materials and information resources, and gives them an avenue to learn more about these issues and get more involved in addressing these issues through interactive public workshops run at community centres that are set up as demonstration centres that people can go to for advice and examples of what they can do.

This is the kind of project that I think is most needed in Wellington. It is also a project that I personally would like to be involved in designing managing and running on WCC's behalf.

Myself and my friend Matt King of Green Earth Development have been working on a proposal to put to Paul Glennie at Capacity and we would like to share this directly with you at WCC if you are interested in hearing more of what we have to say including the nitty gritty of how and why this can work.

Thank you all.

Submission # 99

Forest & Bird Society - Wellington (email submission)

SUBMISSION ON WCC DRAFT WATER EFFICIENCY AND CONSERVATION PLAN

Introduction

This submission is made to Wellington City Council (WCC) on behalf of the Wellington Branch of Forest & Bird. Forest & Bird is New Zealand's largest independent conservation organisation, with over 30,000 members. The Wellington Branch currently has over 2,000 members.

Summary

We congratulate the Council on its forward planning by consulting long before matters reach crisis point. However, we are concerned that the options presented are largely based on a continuation of existing practice in water management, albeit with an increased emphasis on recycling and efficiency. Much of the discussion in the document is based on the premise that we continue to do what we've always done, treating the three water-based services — waste, storm and potable — as separate distinct services.

This concept has been found wanting and a complete rethink is needed. Of the potable water supplied probably less than half is used for personal hygiene, drinking and cooking (based on a Christchurch study). We spend a lot of money making water safe to drink when much of it is used for other non-health critical purposes.

Stormwater is in fact clean rainwater tainted by chemicals washed off the hard surfaces it falls onto. It is this contaminated water that then gets poured into our streams and the sea. This enormous amount of runoff is causing considerable damage to the environment not only in the siltation that is occurring in our harbours but also the depositing of heavy metals and other toxic material.

We strongly object to ratepayer and taxpayer funds being used to flood a portion of native forest in the Akatarawa ranges for water storage, especially whilst we continue to discharge contaminated rainwater into our harbour and waterways causing environmental damage. The Prime Minister has vowed that all water should be used before it reaches the sea, which is precisely what we are not doing with our rainwater.

We need to change the way we approach the problem. We can avoid destroying yet another native forest and also begin to clean up our harbours if WCC adopts the methodology first used in Western Australia 20 years ago to clean up pollution there and make more efficient use of their scarce water.

Water Sensitive Urban Design (WSUD) is in use around the world. Its integrated approach has benefits for the environment and water quality whilst being energy and water-efficient and cost-effective. This idea also happens to fit with the ecological concept of catchment-based solutions.

There are economic benefits to adopting WSUD methods:

- site development is likely to cost less for water infrastructure using WSUD methods, especially on larger scale projects
- there is less demand and therefore cost to WCC for potable water
- it provides a business opportunity to boost the local economy
- a cleaner harbour (without stormwater contamination) could result in shellfish harvesting.

We strongly advocate that money that would otherwise be spent on cleaning up environmental damage, solving our projected potable water deficit, and maintaining our existing infrastructure, should instead be used to implement an integrated approach to water management. It can be done on a case-by-case basis, starting with new buildings and retrofitting existing buildings and road surfaces as they become due for upgrade, repair or maintenance.

We recommend that WCC:

- take a lead by:
    - using water harvesting and reuse in all buildings, especially sports and large event centres
    - reducing potable water consumption within all its operations
- focus strongly on the provision of public education and information on water conservation and related matters
- advocate for modern water-efficient plumbing furniture as standard fittings
- introduce incentives for citizens to retrofit existing buildings with water harvesting and recycling technology
- adopt the principles of WSUD by using:
    - porous concrete and tarmac for roading and pavements
    - water harvesting on all new building projects
    - siphonic water collection methods on commercial buildings of appropriate size
- establish technical liaison and knowledge transfer of best practice with local authorities in Australia with experience of WSUD
- act to reduce discretionary non-essential water use by a mixture of incentives and regulation.

The Problem — Water Supply and Demand in Wellington

The discussion document notes that Wellington uses 30,300 megalitres (Ml) of water each year — which is 30 billion litres or 30 gigalitres (Gl) — an average of over 83Ml per day. About 57% is used residentially, so the annual residential use is a little over 17Gl. Water storage, principally in the Te Marua lakes, allows for smoothing of the supply and demand peaks. Overall responsibility for bulk water supply rests with the Greater Wellington Regional Council (GWRC).

A combination of increasing population and increasing per capita consumption means that demand is increasing annually to a point at which existing storage would be insufficient to ensure supply during extended dry periods. The exact effect of climate change on rainfall in a temperate area such as Wellington is difficult to predict, but some climate scientists predict greater variation, with more pronounced extremes of wet and dry periods — if this proves correct, it will add to the need for increased storage even if demand remains static.

We note that all projected figures are “based on current demand and infrastructure”, or, in other words, based on current thinking and practice. On that basis, it is projected that supply would become insufficient at some point between 2020 and 2025.

WCC and GWRC would then (or somewhat before then) be forced to:

- introduce aggressive steps to reduce demand, or
- build new storage.

Options — the Draft Efficiency and Conservation Plan

The second part of the WCC discussion document describes a number of measures that could be taken to reduce or delay the increase in demand that would eventually require additional storage to be built. While we welcome these ideas and believe that they should be put into practice, their overall impact will be limited — a point acknowledged in the discussion document.

We support the measures listed in Annex 1, but we fear that all the measures taken together will have limited effect without a fundamental change in thinking in two ways:

- by policy-makers in WCC when considering approaches to water management
- by citizens in their attitudes towards water use.

Providing leadership and changing attitudes

Although conservation measures need a change of behaviour to be effective long-term, and this is difficult to sustain, nonetheless that is exactly what is needed. Governments and local authorities both tend to be reluctant to introduce measures that are likely to be unpopular, but the time has come to "bite the bullet".

In the same way that the approaching crisis of climate change will require us all to adopt a changed way of life to become carbon-neutral, so too with water conservation — as a society we need to change our whole way of thinking.

WCC can take the lead. Examples of suggested initiatives are given in the discussion document, and these will help, but more is needed. In the section below entitled "A change in thinking: Stormwater — problem or solution?" we recommend an approach that is already being used overseas, notably in many Australian states.

Discretionary use

Firstly, and most importantly, water is not optional, it is essential to life in all its forms. We are fortunate to have an abundance of water in Wellington — however as a society we increasingly need to appreciate that our use of water is often very wasteful. The discussion document notes, for example, that garden watering may add up to 25% of demand, especially during dry spells. Whether it is a matter of not running the tap continuously when brushing teeth, or not washing one's car so frequently, it all adds up — often the issue is not so much the water saving as the social conditioning needed to achieve a change in attitude and behaviour.

For example, it may be difficult in the short-term to persuade keen gardeners to allow their prize plants to frazzle for lack of water, but over time we must aim to encourage people to plant more drought-tolerant plants (as suggested on p23 of the discussion document).

Financial encouragement

Governments, both national and local, will often use financial incentives and disincentives to bring about changes in behaviour or to reinforce desired behaviour.

These can be effective — however, they are temporary and mask other issues. For example, when justifying a tax on cigarettes to reduce the incidence of smoking-related diseases, the cost of medical treatment is taken into account, but no account is taken of intangibles like pain and suffering because they are not easily reduced to dollars and cents.

It follows that in a cost-based approach (as in the case of water meters versus a new dam) there needs to be an environmental cost factored into the equation — it is not just about dollar value. Our forests provide home to our creatures, filtration for our water and cooling to our atmosphere and are a significant part of our personal well-being, the regional economy and global carbon dioxide absorption.

Reduction, reuse and recycling

We would encourage WCC to support the various measures mentioned on pp 23–24 (for example: reusing grey water, the installation of rain water tanks and low-flow shower heads) by financial incentives of one sort or another.

Education

WCC has already embarked on a laudable educational and informational exercise with the release of the discussion document. On p18 it is noted that: "Research shows that information and education alone are generally not sufficient to change behaviour. However, they are important components of a package of measures, so are a key focus of the Plan."

We support the second part of this assertion and recommend that WCC provide adequate budget for these components to be as effective as possible.

Regulation and enforcement

This should always be the last resort; especially as badly drafted regulations can be counter-productive and cause resentment. However, with an issue as pressing as water supply, there may not be enough time to allow for behavioural change through education and persuasion, so budgets should allow for the provision of effective enforcement of any regulatory measures.

A change in thinking: Stormwater — problem or solution?

Where does it go?

The rainforest and wetlands that existed in Wellington prior to European settlement would have absorbed much of the rain where it fell. This then recharged the water table and the excess filtered into local streams and then to the sea. This natural water cycle has since been modified by Wellington's built urban environment covering 4,200ha of land, of which 1,200ha is road reserve (road, pavement and verge). Wellington receives on average 110Gl of rain each year and 58Gl of this falls on urban hard surfaces. To a property owner rainwater is a nuisance; similarly, a rain-covered road is a safety hazard. The solution has been to collect the rainwater from roofs, driveways and roads and quickly disperse it to the stormwater drainage system where most ends up in our harbours and inshore coastal water. WCC estimates that of the 79Gl of water discharged into the sea each year from streams and stormwater outlets, 55Gl is stormwater runoff.

We understand that the stormwater network is divided up into 42 individual catchments, defined by topography and largely based upon natural drainage characteristics. The majority of catchments drain to a single outlet into the harbour or south coast — mirroring the natural drainage pattern a stream would take. Catchments with open streams are different, as the stormwater is directed to the stream and there can be numerous discharges to the stream.

What is in it?

From an engineering and management perspective this is fine; however, there are environmental consequences. Stormwater is in effect clean rainwater plus contaminants carried by particulates held in suspension in the water. If the flow is sufficient, as is the case during heavy rain, the contaminates are deposited in our harbours along with the sediment. Monitoring by GWRC in recent years has established that much of the contamination of our waterways and harbour by zinc, arsenic, DDT, copper and other hazardous substances is attributable to stormwater discharge[16].

Extracts from the 2008 GWRC report on urban streams in the Wellington Region

> "The most commonly detected pesticide was DDT; 25 sites in 2005 and 21 sites in 2006 recorded a total DDT concentration greater than the ISQG-Low[17] trigger value. Four sites in streams entering Porirua Harbour exceeded the ISQG-High trigger value …"
>
> "Elevated concentrations of one or more contaminants were found in streambed sediment samples from almost all of the sites. Of the heavy metals, zinc was the most common to be found in concentrations above ISQG guidelines …"
>
> "… zinc is ubiquitous in urban environments, the primary sources being unpainted galvanized roofs and vehicle tyre wear …"
>
> "The lack of silts and clays in sediment samples from many of the sites suggests that these components of any stormwater-derived sediment — and the contaminants attached to them — are not retained in streams for long and instead are rapidly flushed through the system into estuarine and coastal waters. This has important implications

[16] Stormwater contaminates in urban streams in the Wellington Region, GWRC, June 2008

[17] ISQG º Interim Sediment Quality Guideline. Originating from Canada, this indicator has been adopted by the Australian and New Zealand Environment and Conservation Council (ANZECC). The ISQG-Low is the level below which adverse effects are very unlikely. The ISQG-High value is the level which is known to have adverse effects on some animals. Between the ISQG-Low and ISQG-High values is a grey area where effects of trace elements and organic compounds are unknown. (www.ew.govt.nz/environmental-information/environmental-indicators/Coasts/Coastal-water-quality/co12a-keypoints)

for less well flushed receiving environments, notably Porirua Harbour and the Lambton Basin and Evans Bay in Wellington Harbour …"

Other environmental issues

Stormwater is also having an impact by a different mechanism. During heavy or persistent rain the wastewater system becomes overloaded and untreated waste is discharged to the environment. This is due in part to rainwater entering cracks and breaks in the waste water pipework, mainly on private land. A case in point is Waiwhetu Stream, where considerable time and money has gone into remedial work to reduce the volume of overflow by between 60% and 90%, depending on the level of the water table at the time[18].

The stormwater network is also a perfect conduit for carrying cigarette butts, plastic wrappers and other rubbish to our streams and the sea. Seeds from invasive pest plants in our gardens are also able to disperse into our wider landscape by this means.

Besides stormwater, the projected shortfall in potable water also has environmental consequences. As the WCC discussion document notes: "In a normal year, and with our current population, there is more than enough water available for extraction from rivers and aquifers and/or stored in the lakes [Te Marua] to avoid problems with serious shortfalls … But the situation is less secure when we have long droughts."

Population increase will heighten the risk of reticulated water shortage during summer and could be made worse by climatic changes in the future. The new water storage facility that has been proposed at Whakatikei will, if implemented, flood a large area of native forest. This is despite the fact that of the 30Gl of potable water we use annually, less than half of the 17Gl consumed by residential users is for drinking and personal hygiene.

New thinking

"We can't solve problems by using the same kind of thinking we used when we created them" (Einstein).

Our water issues are not unique. More than 20 years ago an integrated approach to urban water management, now known as Water Sensitive Urban Design (WSUD), was developed in Western Australia[19]4. This approach considers waste, storm and potable water as a unified system rather than separate entities and can be applied to a site or be catchment specific.

Water Sensitive Urban Design building blocks

Rainwater harvesting

The local collection and storage of rain for later use is a process that's been practised for over 4,000 years and is integral to the WSUD concept. We use it in our backcountry huts, our batches and ski field lodges and in other instances, for example the Botanic Gardens.

Water table replenishment and the avoidance of natural water course contamination are also fundamental considerations. Porous materials for pavement and roading play a big part; a local Wellington example is the pavers being used around the CBD. The 61 tree pits along Waterloo Quay and Cable Street is an example of road runoff capture and infiltration to the groundwater. Unfortunately these are isolated examples; water reuse was initially proposed for toilet flushing at the Indoor Sports Stadium in Kilbirnie but was removed to reduce costs.

Siphonic drainage

Wellington buildings still use gravity drainage systems similar in form to that used by the Romans. Overseas an innovation by Ebeling and Sommerhein in the early 1970s in Scandinavia has revolutionised the building industry and many thousands of commercial buildings worldwide have incorporated siphonic roof drainage systems in their design.

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[18] Annual Report 2009–2010 Capacity Infrastructure Services

[19] Water Sensitive Urban Design — Where to now? Mouritz M, Keynote address at National Conference on Water Sensitive Urban Design — Sustainable Drainage Systems for Urban Areas, Melbourne, August 2000

The basic principle of these systems is to draw water away from the gutter by excluding air from the downpipe. This results in a suction effect, caused by the difference in height between the gutter and discharge point. It is best suited to commercial buildings and structures over four meters in height with complex roof forms[20]5, but can also be used with traditional roof profiles.

The advantage of a siphonic system over a conventional gravity system is its ability to shift large quantities of water at high velocity using smaller diameter pipes at lower building costs. The degree of ground excavation is reduced and the ability to harvest and reuse rainwater at low capital cost is made possible by enabling the storage tank to be placed in a convenient location without the need for pumping or underground pipework.

The stored water can then be used for energy-free landscape irrigation, toilet flushing and other uses.

Permeable concrete

A century ago Europe's designers recognised porous concrete as a valuable structural insulation and about 80 years ago began using it for roads, but it's only in the last twenty years or so that permeable concrete has been widely adopted in Australia and the USA. Today it is recognised as among the Best Management Practices (BMPs) and recommended by the Environmental Protection Agency (EPA) in the US for the management of stormwater runoff. The porous nature of the concrete is achieved by having little or no fine aggregate in the mix and using a uniform course aggregate bonded by the cementitious paste. The resultant lattice-like structure provides pathways for water and air to pass through. The concrete, when installed on a porous substructure such as stone, has significant surface area allowing the combined effects of oxygenation and bacterial action to cleanse water passing through it.

Typical applications are pavements and areas for parking and light traffic. When installed on an impervious layer it can also be used to drain runoff to underground storage.

Finally

We have proposed a different way of viewing water management. It is not new — it emerged in the 1980s and 1990s and is being implemented in the UK, North America and in many parts of Australia, which, being a much drier country than New Zealand, is facing the problems of water shortages and rising demands much earlier than we are.

Of course, water harvesting is not new at all — before the advent of roads and reticulated water systems, what fell from the sky onto our roof was what we used; the rest soaked into the ground.

Roading has made it far too easy for us to dispose of rainwater and to pipe in reticulated water with no concern for the environmental consequences — but this is the thinking of the previous century. If WCC only adopts the measures outlined in the discussion document, Forest & Bird emphasises that it is very strongly opposed to the destruction of native forest in order to provide potable water. Sensible use of rainwater harvesting can reduce our demand for potable water, reduce stormwater damage to our waterways and avoid drowning native forest.

We support the following measures to reduce demand:

- adequately funded public education and information sources
- enforcement of water conservation measures and regulations
- encouraging increased efficiency of usage
- reusing and recycling grey water in WCC buildings
- providing incentives through the rating system (or by grants or subsidies) to encourage substantial changes in behaviour by householders and industrial users
- adoption of WSUD planning and building codes.

[20] Rainwater harvesting options for commercial buildings using siphonic roof drainage systems — Lessons for Building Surveyors Beecham S et al, School of Natural and Built Environments, University of South Australia, 2007

Submission # 106

D Fraser (WCC form / written submission)

Part A - WCC submission form

Water is a 'basic right' for everyone. Water should be kept as a Public asset, paid for by taxpayer's money. I am against water meters and all 'corporate control' of water! Sustainable ways have to be looked at for water-conservation, there are many ways, water collection tanks, artesian wells, water collection stations, saltwater conversion to freshwater and of course building more water dams for water storage conservation.

The Council has to determine, what the best options are for cost, future, and what serves the taxpaying public best, especially in dry years and especially with regard given to 'climate change aspects' (El Nino).

It is up to the Council to regulate water supply restrictions and methods that curb waste, especially in a summer drought! Methods to curb waste have to be strictly enforced. The public have to be told to conserve water in times of drought and emergency.

Part B – written submission

I have submitted a form (Council) outlining my ideas for the water conservation plan, hearing in October 2010. Since then I have had further ideas on the subject. I would be pleased if you could add the ideas in this submission as an added supplement to that one.

The Public Water Issue has become a primary concern for both central and local governments regarding both issues of public control if water as well as conservation at all levels.

It will continue to dominate political concern as long as the issue of 'privatisation' is of topmost concern at government level. 'Public control' should be retained. Water is an essential commodity for everyone! We cannot live without water! Therefore, water should 'be a right to all', it should not be 'privatised' for corporate profit! I am against 'corporate control', the water should be in public hands for obvious reasons, not for profit. I am against water metering as well.

Conservation means – Water, because it is such an essential commodity has to be conserved and rationed in times of emergency, such as severe drought and famine. Because of climate aspects El Nino and La Nania, climate aspects, in light of 'climate change', methods of conservation have to be investigated to protect water waste. Methods of obtaining water resources have to be looked at a well as costing to public and councils. The council have to look at methods of administering the regulation and rationing as well as water restrictions in times of local emergency to the public.

Methods of resources – New ways have to be looked at in retaining water resources. Funding has to be made available for investigating ways to obtain new water resources in light of La Nania, El Nino, weather patterns. NZ has experienced such extreme weather patterns now for several decades, this will continue.

The options for localising resources range from installing water collection dams and tanks, 'seawater to fresh' conversion, artesian well boring, as well as bigger – better aspects for large scale water storage options should be considered as well, new ways of collecting water from natural resources as well. The public have to become aware of protecting and conserving water as well. The council should tell the public of water restrictions and how to conserve water as well.

Thanks for reading this submission.

Submission # 110

G Love (WCC form)

I support the Draft 2010 Water Conservation and Efficiency Plan as outlined in the discussion document as issued by Wellington City Council.

I agree that the plan should include low cost initiatives to reduce /conserve water consumption, and avoid (where possible) the construction of large dams, with the impact on the reduced forest and resultant climatic effects, long pipelines from remote water catchments that are vulnerable to earthquake damage.

The plan should implement restrictions of water use as a last resort. Activities that may be restricted (or limited) include – house and car washing, automatic garden sprinklers, washing down concrete driveways and play (children running through hoses/sprinklers).

The timing of water restrictions may be linked with the fire season and level of fire risk. This will have a dual result of making residents aware of both water usage and fire risks.

Residents should be encouraged to 'dob in a drip' - report leaks, dripping taps, and persons wasting water.

I agree that the plan include the more extensive promotion of information on water conservation and efficiency to all water consumers.

The water usage/demand can be compared to the usage/demand for energy – in particular electricity. We are all well aware of the cost of the supply of electricity and the considerable inconvenience when that supply is interrupted. The supply of water is largely taken for granted by the majority of the population. Some facts that many people may not be aware about are:

- it takes 246 litres of water to produce 1 glass of milk (0.33 litres)
- it takes 450 litres of water to produce 1 egg
- it takes 567 litres of water to produce 1 loaf of bread
- it takes 4,100 litres of water to produce1 cotton Tee shirt
- it takes 2,200 litre of water to produce 1 kilogram of soybeans
- it takes 50,000 to 100,000 litres to produce 1 kilogram of beef
- a top loading washing machine uses up to 2000 litres per wash.

Why do we flush toilets with drinking water? There are alternative toilet technologies e.g. touch sensitive button to control the flow as required, dual flush buttons, water-less urinals (for public events and sites), rain-flush and grey-water systems. In addition, there are low cost "toilet rules" that could be promoted e.g.

"If it's yellow – let it mellow, - if it's brown – flush it down"

Each toilet flush uses up to 10 litres, at six times a day per person, saving 30 litres per day or up to 11,000 to 22,000 litres per year per person.

Likewise there are a number of other activities that water consumers can practise to reduce their consumption or waste of water that have no cost or little to the user. These include:

- fixing of leaking cisterns (hard to see unless food colouring or such is added to the supply tank)
- don't water the concrete driveway
- voluntary water metering or
- capped limits so that hevy users ar charged for excessive or above average use
- rain water harvesting for gardening and washing cars and houses
- emptying the washing machine over the garden (but not after washing the nappies!)
- audits on the use or waste of water (how much is wasted waiting for the shower to run hot)
- reduce the temperature of the hot water to reduce warm up time

In the wider community I would like to see:

- That all new buildings – both domestic and industrial/commercial have water conservation systems e.g. it is estimated that a 300 bed hotel uses 225,000 litres per day. As mentioned in the Plan some TA's already apply this through Resource Management and Building Consents.
- That all new buildings have "on-site" rain water harvesting and storage for re-use within the property. Some toilet flush systems incorporate diversion valves to change between rain and mains water. Widely applied in Australia.
- That all new buildings have grey-water recycling systems for re-use (toilet flushing and gardening) within the property. Note that untreated greywater should not be stored. Again Australia has guidelines on the use of grey-water – delivery to gardens

must be a certain depth and not run on to neighbours property. On-site grey-water recycling will reduce the overall amount of waste water that requires treatment, resulting in less electricity and chemicals involved in treatment.

- That “area’ metering readings be displayed (e.g. at the end of the street) for the education of users, to demonstrate that they are making savings and conserving water. End of street or area water meters could be linked to WCC website via a telemetry system (City-link?) for public display. The domestic water meters (in our street) are “buried” inside the toby box and not as visible as say the electricity or gas meters.
- The Plan for Water Conservation and Efficiency should include widespread publicity and education material for water consumers, similar to the information issued by electricity authorities.

Privatisation of water has one major benefit. The cost of water is more obviously felt in our pockets if there is a “direct” cost. This will change they way we view the value and use of water. There needs to be a balance of private and public ownership to ensure that everyone has access to it. As mentioned in the draft plan there are social concerns and impacts with charging for water based on metered usage. However, these can be addressed by caps or subsidies in fees to avoid penalising those who truly cannot afford it.

We are very fortunate to live in a city with good rainfall and good quality of water. We must plan and work to maintain the quality and quantity of our water supplies and infrastructure in a cost effective way.

I do not wish to be heard in support of my submission.

References:

1. “Every last Drop” by Craig Madde and Amy Carmichael, 2007
2. “Tapped Out” by Paul Simon, 1998
3. “Keeps of the Spring” – Reclaiming our water in an age of globalization, by Fred Pearce, 2004
4. “Water (Life in every drop)” by Julian Caldecott, 2007

Submission # 111[21]

S Love (WCC form)

I support the Draft 2010 Water Conservation and Efficiency Plan as outlined in the discussion document as issued by Wellington City Council.

I agree that the plan should include low cost initiatives to reduce /conserve water consumption, and avoid (where possible) the construction of large dams, with the impact on the reduced forest and resultant climatic effects, long pipelines from remote water catchments that are vulnerable to earthquake damage.

The plan should implement restrictions of water use as a last resort. Activities that may be restricted (or limited) include – house and car washing, automatic garden sprinklers, washing down concrete driveways and play (children running through hoses/sprinklers).

The timing of water restrictions may be linked with the fire season and level of fire risk. This will have a dual result of making residents aware of both water usage and fire risks.

Residents should be encouraged to ‘dob in a drip’ - report leaks, dripping taps, and persons wasting water.

I agree that the plan include the more extensive promotion of information on water conservation and efficiency to all water consumers.

The water usage/demand can be compared to the usage/demand for energy – in particular electricity. We are all well aware of the cost of the supply of electricity and the considerable inconvenience when that supply is interrupted. The supply of water is largely taken for granted by the majority of the population. Some facts that many people may not be aware about are:

[21] Note: replicates submission #110 (G Love)

- it takes 246 litres of water to produce 1 glass of milk (0.33 litres)
- it takes 450 litres of water to produce 1 egg
- it takes 567 litres of water to produce 1 loaf of bread
- it takes 4,100 litres of water to produce1 cotton Tee shirt
- it takes 2,200 litre of water to produce 1 kilogram of soybeans
- it takes 50,000 to 100,000 litres to produce 1 kilogram of beef
- a top loading washing machine uses up to 2000 litres per wash.

Why do we flush toilets with drinking water? There are alternative toilet technologies e.g. touch sensitive button to control the flow as required, dual flush buttons, water-less urinals (for public events and sites), rain-flush and grey-water systems. In addition, there are low cost "toilet rules" that could be promoted e.g.

"If it's yellow – let it mellow, - if it's brown – flush it down"

Each toilet flush uses up to 10 litres, at six times a day per person, saving 30 litres per day or up to 11,000 to 22,000 litres per year per person.

Likewise there are a number of other activities that water consumers can practise to reduce their consumption or waste of water that have no cost or little to the user. These include:

- fixing of leaking cisterns (hard to see unless food colouring or such is added to the supply tank)
- don't water the concrete driveway
- voluntary water metering or
- capped limits so that hevy users ar charged for excessive or above average use
- rain water harvesting for gardening and washing cars and houses
- emptying the washing machine over the garden (but not after washing the nappies!)
- audits on the use or waste of water (how much is wasted waiting for the shower to run hot)
- reduce the temperature of the hot water to reduce warm up time

In the wider community I would like to see:

- That all new buildings – both domestic and industrial/commercial have water conservation systems e.g. it is estimated that a 300 bed hotel uses 225,000 litres per day. As mentioned in the Plan some TA's already apply this through Resource Management and Building Consents.
- That all new buildings have "on-site" rain water harvesting and storage for re-use within the property. Some toilet flush systems incorporate diversion valves to change between rain and mains water. Widely applied in Australia.
- That all new buildings have grey-water recycling systems for re-use (toilet flushing and gardening) within the property. Note that untreated greywater should not be stored. Again Australia has guidelines on the use of grey-water – delivery to gardens must be a certain depth and not run on to neighbours property. On-site grey-water recycling will reduce the overall amount of waste water that requires treatment, resulting in less electricity and chemicals involved in treatment.
- That "area' metering readings be displayed (e.g. at the end of the street) for the education of users, to demonstrate that they are making savings and conserving water. End of street or area water meters could be linked to WCC website via a telemetry system (City-link?) for public display. The domestic water meters (in our street) are "buried" inside the toby box and not as visible as say the electricity or gas meters.
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"Water (Life in every drop)" by Julian Caldecott, 2007

Submission # 120

D Wilson (WCC form / written submission)

I enclose a short paper prepared last year for the WCC all of which I believe is still applicable.

Until our civilisation, particularly officialdom, realises the full extent of our situation I believe I'm wasting my time.

But all the best with you endeavours.

Supplement

Developing the Long Term Council Plan Planning for the Future

Preliminary Submission b Derek J Wilson, formally [sic] of Toomath Wilson Irvine Anderson, architects and engineers, Wellington. 2009

Our civilization, the industrial world of some 200 ears, is rapidly moving into a century of decline of its vital resources. It is no longer sustainable. Unless we recognize this fact and act accordingly we shall, like past civilizations, collapse.

Officialdom – politicians, economists and the business community – together with most of the public is in a state of denial. It is still 'business as usual'. We have not accepted a number of proven facts even though these have been extensively written abut by scientific bodies and the most eminent of international writers.

- Our world runs on energy without which it would grind to a halt. Can you visualize that?
- Peak oil is very near, if not already passed. We are currently burning four barrels for every one discovered.
- Peak gas has already passed.
- Peak coal, if we continue to use it as we are doing, especially China and in doing so doing causing further irreparable climate change, is also a finite resource. It is only a matter of time before production reaches its peak.
- Uranium is a finite material. With the planned increase in nuclear power plants it is only a matter of time before it too peaks.
- Biofuels are destroying invaluable agricultural land, and bear in mind that:

There are no combinations of energy sources within sight that will support a small fraction of the life style that the western and westernized worlds have grown accustomed to.

Shouldn't we make a transition as rapidly as possible way from the use of fossil fuels? In other words, pursue the full potential of hydro, geothermal, tide, wind, solar, etc?

As Edward Goldsmith, founder of *The Ecologist*, said in 2001:

> The issue today is survival not development, and most certainly not growth], and the strategies required to enable us to survive in the ever less precipitous climate conditions are the exact opposite of those

> required to promote development, let alone global economic development…. But there is no time to lose – time is short.

We face an extremely difficult but not impossible task. Officialdom believes explicitly that growth above all else, including peoples' genuine welfare, must be continued. The whole economic edifice which depends on material growth and consumption is now falling apart and will continue to do so for some considerable time. An increasing number of international writers together with prestigious journals – *TIME, New Scientist The Ecologist, Pacific World*, and others – say very clearly that growth is killing us. I should have thought it was obvious.

The nature and enormity of this problem are so so unprecedented that we have no mechanism for dealing with them. For the first time in our civilisation the issue for all of us is indeed *survival*. And yet organisations such as the World Bank (WB), World Trade organization (WTO) and trans-national corporations (TNCs) are fiercely promoting more and still more unsustainable growth. The WB, for example, has financed $US13.6billion worth of energy projects in developing countries since the Rio Earth Summit in 1992, including 51 coal, oil and gas fired power plants and 26 coal mines. These projects will emit 38 billion tonnes of CO2 over their lifetimes, nearly double what was emitted in 1996 by all countries combined. Instead of jump starting the global market for clean and renewable energy, WB loans are lining the pockets of undemocratic Third World regimes and the richest and most powerful corporations and creating a self-fulfilling prophecy of rising greenhouse emissions, dirty profits and rapid climate change.

These organisations, an many others, seem not to have grasped the implications of the fact that on a finite Earth with finite resources:

- On average, the additional economic output in each of the last four decades has matched that added from the beginning of civilization until 1950. While this phenomenal growth has taken place, i.e. between 1950 and 1990 – over 40 years:
    - The world's population doubled
    - The number of people living in absolute poverty doubled
    - The gap between rich and poor increased six-fold

Most economists consider a growth rate in excess of two percent is necessary to keep the world economy going. But if we take a two percent growth rate in gross national product this would lead to roughly an eight-fold increase in the size and impact of our economic activities on the natural world and its atmospheric environment. This for all of our sakes is not even remotely possible.

The World Resources Institute shows total annual CO2 emissions as an exponential (hockey stick) curve. If we pass the so-called 'tipping point' God help us.

Water. There is a world wide water decline

Population. Overall world population continues to grow. We have been told that a population of two billion can be reasonable well supported, or alternatively we need several new Earths.

Pollution. We continue to pollute land, water and air with increasing disasters.

I could go on about these matters and many more at great length as I did in my book *Five Holocausts* published in 2001.The present exercise, as I understand it, is to provide input for your planning over the coming ten years. I have refrained from doing this as opportunity occurs later to make specific representation.

Unless the basic points (and other major items) I have mentioned are fully appreciated by officialdom and appropriately acted upon, I see little point in viewing specifics of long term planning.

Submission # 120

Loyola Christian Life Organisation (On-line submission)

Firstly, let me say how impressed I was with the man fro Capacity, who gave an overview of the situation and possible solutions.

1. We are firmly opposed to any privatisation of the water supply, because the right to clean water and sanitation is because the right to clean water and sanitation is a basic human right, lately re-emphasised I the statement from the UN Council for Human Rights (6 Oct, www.ochcr.org/EN/ages/Welcomepage.aspx). The cost associated with providing safe water may be recouped, with some allowances for large families, and others in need.
2. We are thus opposed to water meters, because of the disadvantage to groups mentioned above, and the cost of installing and managing them.(I have a water meter, which costs as much to manage as the cost of the water I use.)
3. Education as to the prudent use of water – a limited resource – which may need to be restricted in times of drought, as is often the case now. Watering of gardens could be restricted to a few days per week, hand held hoses, or an automatic system with time control. Some financial incentives for water use under a certain amount is summer.
4. Greater control of commercial users, by education and financial help as best practice, and some tariff mechanism for over use.
5. The ongoing replacement of aging repairs and the swift repair of leaks.
6. Long term planning for another dam, as envisaged on the other side of the earthquake fault seems prudent. Start saving now!
7. Would it be possible to build smaller tanks around the city, to capture water in a deluge?

Finally, water is a scarce and precious resource. Normally, we a have sufficient in the Wellington region, but more sever weather patterns are beginning to emerge as a result of climate change, and we need to be prepared, to save and conserve water in times od deluge, which also prevents our city from washing away into the sea, so we have water in times of drought.

Thank you fore your extensive documentation on this essential matter. I have great hopes for our city and region, especially with our new Mayor, Celia Wade-Brown.

We would like to be heard in oral submission.

Appendix XX

Dominion Post / GWRC press release 1 September 2010.

"GW investigating new water storage options at Kaitoke"

Greater Wellington has secured an option to buy land owned by AgResearch at Kaitoke, adjacent to State Highway 2, with the intention of investigating the land to find out if it's suitable for a water storage lake.

"The size of the proposed lake will be determined during the investigations but it could have a capacity of around 5,000 million litres – making the volume around 50% larger than the two Stuart Macaskill water storage lakes combined," says Greater Wellington's Utilities and Services General Manager Murray Kennedy.

Water for the proposed lake would be piped from near the Te Marua Water Treatment Plant, using the existing Kaitoke weir resource consent. The lake would allow Greater Wellington to capture more of the water when there is high rainfall but would not affect river levels at times of low flow.

The investigations are likely to begin in November and could take up to 12 months. They will include investigations into geological/geotechnical and civil works as well as environmental, social and cultural issues.

Murray says that if the site is seen as being suitable for a storage lake, it will be evaluated along with other options that Greater Wellington has previously investigated for future water supply.

"If the proposed lake is built, a dam or another water storage lake probably won't be needed for about 20 years. If a new storage lake isn't built soon, it's likely that a dam would need to be built within 10 years. However, timing will depend to some extent on household and commercial water usage, with Greater Wellington remaining committed to reducing per capita water consumption."

Murray says that if a decision is made to proceed with the project, the public would have the opportunity to have their say on the project through Greater Wellington's Long Term Plan process and the Resource Management Act's resource consent process.

If the project proceeds, construction is likely to take two to three years to complete after the necessary consents and approvals are obtained. The cost of purchasing the land would be determined through Greater Wellington's negotiations with AgResearch.

Greater Wellington is responsible for supplying bulk water to the Upper Hutt, Hutt, Wellington and Porirua city councils.