

SOUTH WAIRARAPA DISTRICT COUNCIL

23 APRIL 2014

AGENDA ITEM C8

SUPPLEMENTARY WATER SUPPLIES

Purpose of Report

To provide information to Councillors relating to supplementary water supplies.

Recommendations

Officers recommend that the Council:

1. *Receive the information.*
2. *Resolve to continue to promote and create and use educative material to encourage developers and individuals when building a new house in an urban area to consider incorporating supplementary water supply/reuse systems.*
3. *Resolve to formulate a Water Conservation and Efficiency Plan for the Public Water Supply System*

1. Executive Summary

In recent times many Council's around the country have been investigating ways to increase domestic water supplies without developing major new infrastructure. Other Councils' have been promoting "sustainable development" ideas, including households making greater use of alternative sources of (fresh) water.

These drivers have led to various forms of supplementary water supplies being considered in urban environments, mainly for housing.

Typically in urban areas these involve capturing rainwater and/or domestic waste water (grey) to supplement normal reticulated supplies. In rural areas roof collection has traditionally been used to supplement groundwater or surface water takes, while in water deficit areas grey water recirculation has become more common.

In order to move toward more onsite collection/re-use of water, a number of Council's have adopted promotional programmes allied to higher charges for reticulated water or subsidies to build onsite facilities. Others have attempted to regulate a move toward greater use of supplementary supplies through bylaws or District Plan rules. Some have done all of these things.

There is much technical analysis available around all of these aspects; however this does not un-equivocally support the adoption of such systems due to often high owner and whole of life (community) costs relative to mains supply.

In terms of whole of life costs, the research shows that such systems often incur higher overall environmental costs in terms of energy/carbon consumption than conventional reticulated supplies per cubic metre of water delivered, as well as increased financial costs.

Regardless of these technical assessments, the idea of using existing "free" supplementary water supplies has gained a degree of community acceptance in some centres (e.g. Auckland) and is being promoted by environmental groups and some Council's.

This community acceptance has been driven by water shortages and/or the high cost of accessing new water supplies (e.g. Auckland using Waikato River water) and cultural opposition to new takes (e.g. shifting water between natural catchments) or the desire to be part of a "greener" urban system.

This report evaluates these aspects and in consequence does not advocate Council introducing regulatory controls to enforce a change. It suggests instead that Council continue with the current "soft" approach of promoting and using educative actions towards the use of such systems and develop a water conservation strategy along the lines of the attached Wellington City document.

2. Background

At the Planning and Finance Committee meeting held on 23 November 2013 the following action note was initiated;

"Advise the P&F Committee on what is required for Council to require supplementary rain harvesting tanks for all new rural and/or urban water connections".

This report has been prepared in response to the action note.

3. Discussion

In brief, it is considered that before simply reporting on options to require the use of supplementary rain harvesting tanks, officers should ensure that Council is fully informed of both the possible benefits and costs of taking such a step.

3.1 Current local approach

The Wairarapa Combined District Plan only contains brief references to the use of alternative water sources when considering subdivisions and development proposals. It states in Clause 18.3.6 Explanation of Policy 18.3.5 - SLD2 [page 18-9] that;

“consideration needs to be given as to whether measures need to be taken to manage this demand [for new connections to water supply services] at the time of subdivision and development, such as by requiring supplementary water collection, including rain water collection tanks”.

It then also states that as one of the Methods in Section 18.3.16 (n) [page 18-14] by which the District Plan is to be implemented the following;

“that within 2 years of the Plan becoming operative (25th of May 2011)... Council should review the demand for water from reticulated water supply services from new residential subdivision and development, with the aim of investigating and introducing water conservation requirements for new residential subdivision and development such as rainwater collection tanks”.

3.1.1. Carterton

The Carterton Council considered the issue of supplementary water supplies late in 2010 and before the Combined District Plan was operative. The findings accepted by that Council at that time were:

- a) sufficient capacity existed to cater for growth for a considerable time to come,
- b) demand management should be the overarching strategy adopted to reduce potable water usage,
- c) the provision of onsite rainwater collection and storage facilities for new dwellings could be promoted on the grounds of convenience and sustainability but not cost,
- d) cash incentives could only be justified if seen as a subsidy to a new dwelling owners additional costs,
- e) the best incentive might be a waiver on consent application fees (still a cost to Council) and
- f) existing infrastructure will remain the backbone for potable water supply in the foreseeable future.

The outcome was that no regulatory or fiscal changes were made. However the provision of rain water storage is raised as a matter of information / encouragement for building and resource consent applicants.

3.1.2. Masterton

The Masterton Council has not undertaken a specific capacity review relative to future demand for water. However sufficient capacity exists to cater for future growth. No action has been taken in response to the method contained in the Combined District Plan.

3.1.3. South Wairarapa

As part of its asset management activity, the Infrastructure and Services Group reviewed the impact of any demand for new connections from properties currently outside of the reticulated networks Council operates.

Officers were required to calculate the capacity of those networks (i.e. how much additional water could be supplied) in order to make this assessment.

Based on this work, the conclusion was that *“sufficient capacity existed to cater for the foreseeable future in terms of all growth scenario’s, including high growth rates and the extension of the network to peripheral housing areas”*.

In terms of demand therefore, this work and finding has satisfied the first requirement of section 18.3.16 (n) District Plan method as quoted above.

In addition officers currently provide information to applicants and often, subdivision consents will contain notes on the need for water storage capacity in rural areas both for household use and fire control.

3.1.4. Bylaws

Outside of the District Plan and as for the other two authorities, the bylaws are currently silent on the matter. In any case bylaws do not provide an easy option for requiring the provision of supplementary water supply systems for dwellings whether in urban or rural areas.

Making a bylaw for such a purpose appears to be expressly prohibited by the Building Act.

3.2 Current national approaches

The Wellington Regional Council (WRC) has adopted a water conservation approach which focusses on the promotion of a range of measures to reduce demand and avoid wastage of freshwater.

This approach is reflected in the Regional Plan which promotes the efficient use of allocated water (including for public water supplies) and through resource consents requires those exercising a water take to report on usage and minimise consumption and promote and undertake water conservation measures. The Regional Plan does not however specify the “how to” in terms of achieving these ends.

WRC recognises that outside of these regulatory controls the best approach is one of promotion and education about water conservation and water use efficiency. The WRC website thus provides information on water conservation including the installation and use of rainwater tanks.

Much of the discussion on these tanks is however centred on access to a water supply in an emergency although their role as a supplement to reticulated supplies is also discussed.

Wellington City Council has adopted a “Water Conservation and Efficiency Plan” which focusses on conservation and prevention of waste. This plan briefly discusses the use of rain water storage/ greywater reuse, but does not actively “push for” such solutions as the focus is on active measures to lower average household use of water (the how much).

Around the rest of the country a similar approach has evolved. In Auckland prior to local government reform, each Council had developed (very similar) information documents concerning the installation and use of rainwater storage /greywater reuse systems.

This material acknowledges the benefits to home owners but also state that these tanks may not be the most economic or environmental option. They also raise through research papers questions about the effectiveness of such approaches if tanks are made compulsory.

3.3 Supplementary water harvesting

The benefits commonly associated with supplementary water supplies in an urban context are;

- a) provide an alternate supply of water in times of water shortage
- b) reduce overall demand on the reticulated system using a "free" supply.
- c) attenuate flows, particularly peaks, in reticulated stormwater systems and potentially reduce the need to invest in new capacity.
- d) can be used to capture first flush contaminants so improving water quality of stormwater discharges to natural water.
- e) they provide an emergency supply.

However, these benefits are commonly argued to be off-set by the following issues associated with supplementary water supplies in an urban context;

- a) high cost because of additional permissions, materials and installation/poor system efficiency. Typically for a <3000L tank (rainwater collection only) the cost to a home owner is a minimum of \$7000 rising to \$14000 for a more durable system. This equates to a unit cost 2 to 3 times the cost per cumec of water supplied than from a normal reticulated source. In addition research has shown that in environmental terms these systems on average impose higher resource consumption costs on a whole of life basis on the environment (for carbon emissions and energy used).

- b) marginal impact on demand for water or on need for a reticulated water supply. Rainfall is not spread evenly through the year and is lowest when the greatest need for water occurs (summer). This inherently means that the benefit to a household of a supplementary water supply is not well aligned to the need. Often in this peak demand period the reticulated supply is the only viable and reliable source of water. For Council it means that provision still needs to be made for peak demand and also for the potential total volume that could be drawn down by households connected to the reticulated supply. It has also been found that during periods of rainfall, tanks reduce the quantities being taken and paid for from the reticulated supply so reducing the overall operational economics of such systems. In that respect the WRC has noted;

*"*In 2011, Greater Wellington commissioned research into whether installation of rainwater tanks for toilet flushing and outdoor water use would help defer building a new water storage lake or dam. The results of this research showed that a rainwater tank could provide for a high percentage of a household's water needs for toilet flushing and outdoor uses. However, widespread installation of tanks would not be cost-effective as an alternative to developing the metropolitan Wellington water supply system".*

- c) marginal impact on stormwater quality or in reducing volume of stormwater discharges. While this benefit is not a major issue in South Wairarapa, it is one of the other reasons such systems are promoted elsewhere. The difficulty with using the onsite storage to do these things lies in a conflict between water quality and volume. To

reduce initial storm flows rainwater tanks need to capture a significant part of the rainfall as it flows off a roof. To do this it ideally has to have spare storage (be relatively empty), which if a tank is to work for a homeowner properly is not so good. If it is already full or close to full, then it has little effect on the flow volume leaving a property. Likewise with water quality, if the tank is "empty" it will receive the "first flush" and this water is likely to hold contaminants which makes its use for a household more limited. If it is full or near to, then the contaminants head off into the stormwater system for discharge to a natural water body.

- d) ongoing maintenance costs. Supplementary water supply systems often need to be pumped so that the water can be used in a house. Pumps need pre filter systems to prevent unwanted material passing through them and wearing out the system or clogging it. Regular upkeep of filters is costly. The pumps themselves need regular maintenance as well. This can also be expensive.
- e) if for potable use, cost of treatment before consumption. If the supplementary supply is for potable water, it is normal for treatment to take place. This is not just for bacterial risks, but also for heavy metals and other residues that can wash from a roof as it weathers over time. Zinc, oxidised paint compounds and airborne particles (e.g. particulate matter) can readily enter the water, especially in an urban setting. These all need to be removed before consumption of the water. This is not easy to do and can be expensive.

3.4 Mechanisms available

It is open for Council to include provisions (rules) in the District Plan to require the use of supplementary water supply systems for households. This would require the preparation and processing of a change to the Plan.

Given that few other Councils' have done this to date, it may be better to focus on other approaches. Promotion and education are clearly the cheapest and most easy thing to do. It would be consistent with the WRC approach and what Wellington City and CDC currently are doing.

3.5 Best Approach

If Council wants to ensure that the public water supply system is not subject to excessive demand and waste of water, it could choose to follow the approach being taken in Auckland and Wellington Cities for instance and Wellington Regional Council.

These Council's focus on managing demand through focusing on water conservation and efficiency. This does not mean that the use of supplementary systems of water supply is ignored, rather they become just one part of a global approach to water supply and conservation and efficient use.

In that respect the Wellington Plan is attached for Councils information. If Council did not want to take that approach, then it is suggested that the current "soft" approach simply continue.

4. Conclusion

While it is possible to introduce rules to require the use of supplementary water supplies for households, this would impose a significant new cost on building a house as well as possible ongoing costs of operation, while not reducing Councils responsibilities to maintain and upgrade the public water supply system overtime.

There appears to be no significant benefit for either homeowners or Council. Instead Council can focus on demand management and efficiency of use which is what other Councils' are doing.

5. Appendices

Appendix 1 – Water Conservation and Efficiency Plan 2011 (Wellington City)

Contact Officer: Murray Buchanan, Group Manager Planning and Environment

**Appendix 1 – Water
Conservation and Efficiency
Plan 2011**