

Rainwater Tanks to Supplement Town Supply

Council Briefing

12 November 2020



Reasons to Consider Rainwater Tanks

- Next New Water Source
- Drought Resilience
- Reduced Cost
 - Council
 - Homeowners
- Environmentally Friendly
- Emergency Supplies

New Water Source

- Study started in 2003
- A total of 21 potential sources considered
- These included Wilsonville Quarry, Kamo Mines, a number of rivers and also rainwater tanks for outdoor usage.
- All options were ranked and the top ranked options underwent more in depth analysis
- Rainwater tanks ranked 15th of the 21 options with the comment from the consultants being “The present investigation considers the installation of rainwater tanks to be a fatally flawed option, in that the capital cost to yield ratio is excessively high.”

New Water Source

- On completion of the in depth studies initially Ngunguru River was chosen.
- However, after a further review and with support from Northpower the Wairua River was ultimately selected.
- The Benefits of the Wairua Option are;
 - We have an existing take consent and can take water down to low flows
 - Cheapest option as only upgraded water treatment plant required.
 - It can provide approximately 10,000m³ of additional water per day
 - Allow for future expansion to Mangakahia River and possibly Maungatapere Forest Dam.



Drought Resilience

- The 2020 Drought highlighted the need for improved Resilience
- However in the worst Drought on record Dams didn't drop below 40%
- The Hatea Line and the Whau Valley WTP upgrade will help
- The Poroti/Wairua Upgrade will add the equivalent of 2,000,000m³ of storage at a cost of up to \$30 Million.
- Can Rainwater Tanks also play a part?



Rainwater tank as supplementary water source

- Only considered for outdoor use. Most other water suppliers have looked into this at some point and decided against it.
- In order to assist Council the water needs to be guaranteed so infrastructure can be reduced
- Rainwater tanks can't store enough water
- If every domestic property in the City had a 5m³ tank full at the start of a drought it would provide an additional 105,000m³ of Storage
- This is approximately 6% of Whau Valley Storage.
- If only future properties had tanks – then approximately 65,000m³ could be created over next 50 years – 3.25% of Wairua Source and a cost of \$90,000,000

Potential Issues

- Tanks need to be full at start of drought
- Lack of ongoing maintenance and replacement (Sydney Study)
- Difficult to enforce
- Need to ensure tanks are not refilled with town supply
- Make enforcing restricts more difficult
- Requires community to adopt certain behaviors
- Only reducing demand that supplier can control with restrictions

Potential Benefits to Households

- Rainwater tanks are often considered a cheaper, environmentally friendly water source
- Studies from around the world have queried this
- However, each supply is different.
- What is the local situation?
- Undertook a study of our water supply network and the local cost of rainwater systems
- Study made some assumptions about things like tank and pump size and water volumes but generally took a conservative position.

Study Findings

	Rainwater Tanks (for Outdoor Use)	WDC Town Supply
Operational Energy Intensity	1.10 kWh/m ³	0.43 kWh/m ³
Lifecycle power cost per m ³	45 cents	11 cents
Total whole of life cost per m ³	\$10.49	\$2.52
	All costs excl GST	

Carbon Footprint

- The total Carbon Footprint of Rainwater Tanks and WDC water supplies have not been calculated.
- The Environment Agency did this work for the UK and concluded rainwater harvesting had a 40% larger footprint than town supplies.
- We do know that for WDC the power usage of rainwater tanks is 2.5 times greater than town supply per m³.

Emergency Use

- Water Tanks can be useful when no town supply is available in an emergency.
- Tanks as small as 200 litres can be used to store water to supplement the 3 days supplies that all residents should keep.
- Tanks need to be kept full so as to be available when needed.
- The water is not potable and would need to be treated or boiled if it was to be drunk

Conclusions

- Rainwater tanks provide very little benefit in a drought scenario
- Rainwater tanks will not reduce the amount of water infrastructure required
- Rainwater tanks use 2.5 times more power than town supply per m³
- Over the life of the tank it will cost users more to use tank water than to use town supply