WATER METERING IN A RURAL DISTRICT

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ABSTRACT

Water Metering in a Rural District

The Western Bay of Plenty District is one of the fastest growing areas in New Zealand with its current population of just over 45,400 people estimated to reach 60,268 by 2026. Of the 19,500 properties within the district, 14,050 are connected to Council's 660kms of water mains.

Currently water meters are installed to approximately 4,200 industrial businesses, commercial business properties or rural properties greater than 5000m^2. Domestic properties are generally not metered, however this is changing.

For Western Bay of Plenty District Council's water supply, the past decade has been a journey of transition from surface water supplies to secure ground water supplies and water grading of Bb or better.

As a Water Supply Authority, there are many drivers at national, regional and local levels that give direction to Council for the conservation, use and sustainable management of drinking water for current and future generations.

Councils recently introduced Water Conservation Strategy includes measures help provide a better security of supply and plan for future growth demands. These benefits have a wider regional impact on social, cultural, economic and environmental outcomes.

Water metering is the single most significant demand conservation initiative identified due to its far reaching effect and the range of conservation measures it can address.

This report will include water metering initiatives and benefits that are specific to our district and Councils direction to phase in district wide water metering by 2018 to secure water supplies for current and future generations.

KEYWORDS

Water Metering, Demand Management, Conservation, Water Source, Communities, Levels of Service.

1 INTRODUCTION

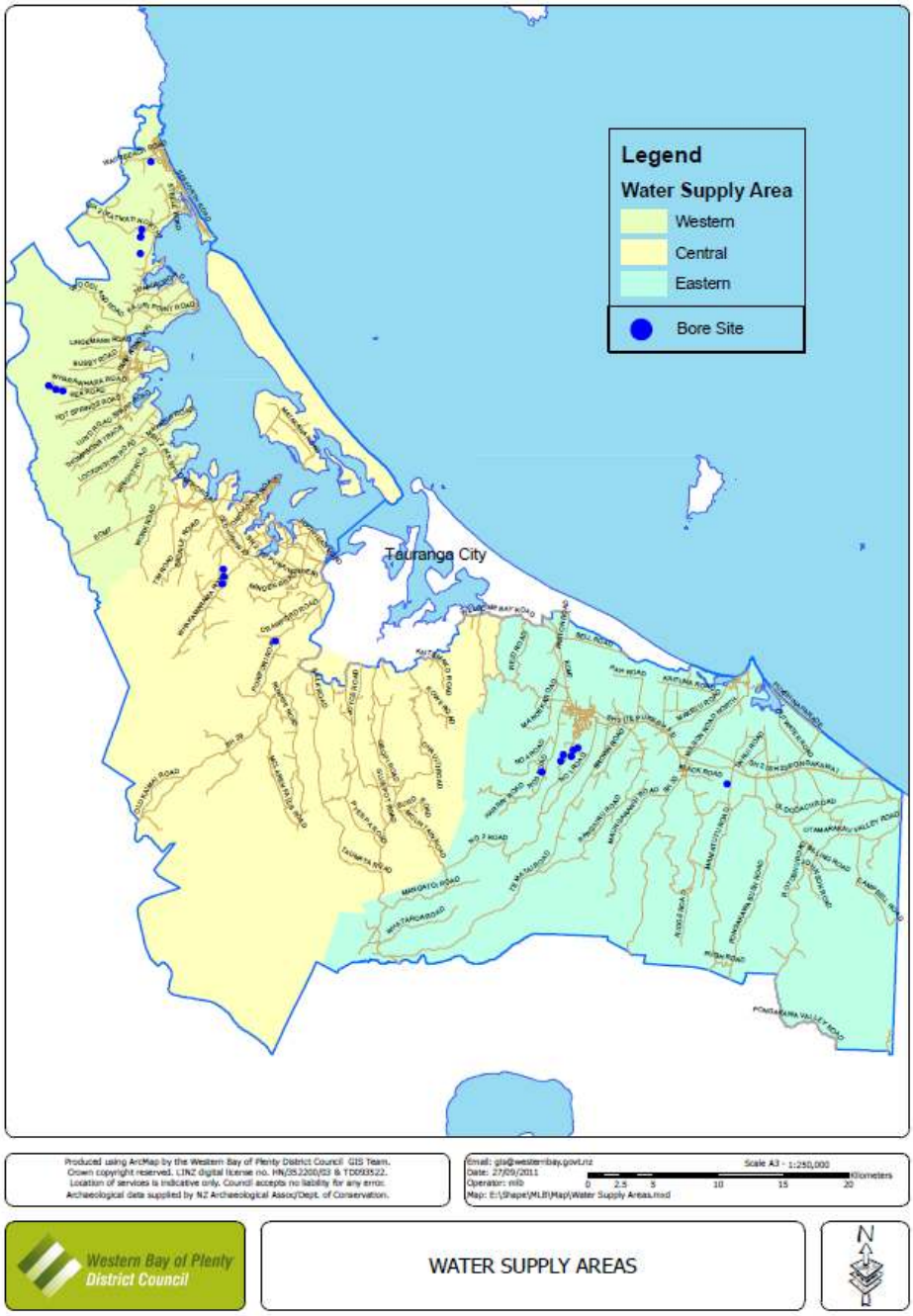
Western Bay of Plenty District Council (Council) is due to start the final and most significant stage of district wide water metering in 2012. By mid-2018 all water connections within the district will be metered. Currently non-domestic and rural properties (> 5000m^2) are already metered, which has been Councils policy for the past two decades.

Councils water network distributes potable water to about 31,000 people (approximately 70% of the total population of the Western Bay of Plenty district) through 660 kilometers of water mains within the district. Through its Long Term Council Community Plan, Council is committed to providing potable water to its customers at agreed levels of service. This includes achieving and maintaining a minimum Bb source/treatment and reticulation grades and providing fire mains within urban fire zones.

Over the past decade Council has moved away from surface water supplies, such as rivers and streams which are prone to drought or contamination of catchments, in favour of secure underground aquifers.

Due to the large geographical area and topography of the district, it is operated in three supply zones. The Western Supply Zone (Waihi Beach, Athenree, and Katikati to Morton Road) and Central Supply Zone (Te Puna, Minden, Pahoia and Omokoroa) networks are physically linked and can 'share' water between each zone when demand or operating circumstance requires. The Eastern Supply Zone (Te Puke, Maketu, Pukehina and Paengaroa) is a 'stand alone zone', however it has two separated bore fields which allows for supplying water from either end of the Zone to meet demands.

A plan is included to show the Water Supply Zone and bore locations.



Each supply zone has a number of water bore fields and large reservoirs, in various locations to ensure it has the ability to effectively distribute water to the customers. The gravity fed trunk mains pipelines are located in cross-country properties, rural roads and state highways over long distances. On route in most cases rural customers are connected to these mains, for agricultural, horticultural and typical rural lifestyle and domestic uses. Pressure boost pump stations and smaller storage tanks are needed to support the distribution of water to the outlying rural population sectors, which in some parts are at higher altitudes than the main reservoirs.

Typically the network infrastructures capacities are designed to provide for a domestic water supply (20mm) for each customer and deliver sufficient flow and pressure at hydrants for fire fighting in urban fire zones. However when designing affordable, long distance trunk main systems for hydraulic capacity, including future demands, eliminating unnecessary losses becomes an absolute priority.

The limitation Council faces is how much water is available any one time for use over and above normal daily demands. Herein lies the challenges, particularly during peak demand times.

2 WATER METERING IN A RURAL COMMUNITY

2.1 WHAT'S MADE WATER METERING THE RIGHT OPTION FOR WESTERN BAY?

Councils Water Demand Management and the Water Conservation Strategy are the main drivers that lead into water metering.

The issue of allocation of ground water supplies in recent years has resulted in the Bay of Plenty Regional Council undertaking significant environmental studies in the Western Bay of Plenty. The growing competitive demand for irrigation and municipal water needs, coupled with the increasing need to protect our threatened ecological system, challenge us to find ways to better manage our water resource. The over-allocation of groundwater supplies can lead to a wide variety of environmental, economic and cultural issues with solutions becoming more expensive and politically diverse if allowed to fester.

The Asset Management Plan – Water (AMPW) provides the framework for the delivery standards and development based upon technical and financial justification. In turn, the AMPW is underpinned by various procedures that plan the operational and management actions needed for successful delivery. These include demand management, focusing on initiatives to manage consumption related impacts and allow a fair and adequate supply to all district consumers.

Council sees water conservation as a fundamental part of enabling present and future generations to gain the greatest social, economical and cultural benefits from our water resources, within an environmentally sustainable framework.

Achieving water conservation requires innovative action plans, changes to consumer behavior, new ideas and technology or improved design or process to reduce water demands, wastage and losses. While continued education programme initiatives will assist in changing behaviors, water metering is the single most significant form of demand management, given its far reaching effects and the conservation measures it addresses.

2.1.1 WATER SOURCE

Council has clearly set levels of service within the Long Term Plan to achieve and maintain a high quality potable water supply for its communities. Over the past decade or more, the move away from surface supplies to secure ground water bores was a critical strategy in achieving these levels of service. Through this same period there was a significant drive to augment and renew some of the strategic trunk mains throughout the district to strengthen the network reliability and capacity. Collectively these investments are the foundations for securing of the water supplies for the current and future generations of water consumers within the district.

2.1.2 DRIVERS

There are many drivers that give direction to Council for the use and management of drinking water. The Public Health Act 1956 requires Councils to improve, promote and protect public health. The Local Government Act 2002 provides for Councils to construct and operate water supply networks.

Under the Health (Drinking Water) Amendment Act 2007, the public health performance of water supplies is subject to the water supply grading requirements administered by the Ministry of Health pursuant to the New Zealand Drinking Water Standards. The most significant statutory frameworks and key legislations relevant to water issues are:

At a national level:

- New Zealand Drinking Water Standards DWSNZ (amended 2008) Ministry of Health
- Resource Management Act (1991)
- Health Act (1956) Amendment
- Local Government Act (2002)
- Building Act (2004)
- Fire Service Act 1975
- Water Supply Protection Regulations 1961

At a regional level:

- Regional Policy Statement
- Regional – Water and Land Plan
- Smart Growth Plan

At a local level:

- Long Term Council Community Plan
- Western Bay District Plan
- Annual Plan and Budgets
- Asset Management plan – Water
- Public Health Risk Management Plans
- Water Supply By-Laws, and Terms and Conditions of Supply

These frameworks and policies set legislative responsibilities, compliance requirements and sustainability reasons which deem water conservation necessary for Council. A more recent example of this is a Regional Council water source consent requirement that:

> *"The consent holder shall take all practicable steps to implement the provisions of the Water Conservation Strategy and shall provide a report not less frequently than every 3 years to the Chief Executive of the Regional Council or delegate of progress achieved in implementation of the Strategy".*

Therefore, Council must ensure it has initiatives and plans in place aimed at reducing water losses and efficient operation of the water supply system, as well as addressing demand for domestic commercial, industrial and rural users. The implementation of these initiatives must be managed through the relevant plans, to ensure efficiencies are gained and measured.

2.1.3 GROWTH

The WBOPDC is an area covering 212,000 hectares, the District consists of five wards – Waihi Beach, Katikati, Kaimai, Te Puke and Maketu and has a population of 45,380 (Stats NZ 2010 predictions). The 2006 census revealed population growth of 10.1% since 2001, compared to the national average of 7.8%.

The Western Bay of Plenty continues to be a desirable place to "live, work and play." It is predicted that the Bay of Plenty will become New Zealand's fourth or fifth most populated region. The live, work and play principle emphasises the need for a more compact approach to land use and planning to limit "urban sprawl."

Council manages growth within the District using a SmartGrowth Strategy, which is a limited statutory document. Implementation of the strategy is driven by regional and territorial authority statutory planning documents prepared under the RMA. The Bay of Plenty Regional Policy Statement (RPS) contains a growth management strategy designed to anchor land use patterns and set development targets (including minimum residential densities) for the Western Bay of Plenty sub-region. WBOPDC has set areas within urban centres for more intensive development.

Smart growth predicts the population to increase by 15.5% between 2012 and 2022 and the number of rateable properties is forecasted to increase by 14.6% over the same period. Based on current daily average water production figures and predicated population growths, the AMPW identifies the need for new water sources in;

- WSZ in 2018/2019
- CSZ in 2015/2016 and;
- ESZ in 2015/2016

If water demand across the district could be reduced by 10% this forecasted capital expenditure could be deferred by 5 – 8 years making a significant saving on borrowed funds.

2.2 WATER DEMAND MANAGEMENT

2.2.1 LONG TERM PLAN DIRECTIONS

Demand Management – The Long Term Plan; sets out the strategic directions for the supply of potable water to the residents of the district and the required Levels of Service (LOS). These directions and LOS predicate such things as the investment in water source, storage and reticulation needed to meet future demand requirements.

2.2.2 ASSET MANAGEMENT PLANNING

Demand Management – The Asset Management Plan; aims to modify the 'natural' patterns of consumer usage through reducing consumption rates (peak), making more efficient use - and prolonging the life - of the existing asset, and providing a stable platform for future development options. Demand management initiatives together with the implementation programme and performance measures designed to demonstrate compliance with Council's long-term objectives through:

- ► Understanding current and future demand patterns.
- ► Optimising capacity and efficiency of production, storage and conveyance systems.
- ► Establishing appropriate maintenance and growth plans.
- ► Developing and maintaining consumer awareness of the impact they have on the supply.
- ► Development of an affordable and measured implementation programme.
- ► Regular review of the actual costs and benefits achieved by the plan.

It is the Demand Management Plan, which is seen as the most valuable output of this investment. It is a continuous improvement process and allows decisions that reduce wastage while supporting asset and level of service enhancement. A number of the initiatives included in the plan address topics such as water balance, pressure management and demand forecasting which are outside of the main focus of this report being water metering for rural communities. However, they are closely linked to the purpose and initiatives included in the Water Conservation Strategy.

2.3 WATER CONSERVATION STRATEGY

Completion of the conversion process, from surface water supplies to secure ground water bores, has allowed Council's future focus to be on conservation of water. Councils Water Conservation Strategy is a combination of what is currently being done and what else should be done to contribute to the overall conservation of water and the sustainable use of water sources in district. This plan provides the foundation for further improvements and future directions for water conservation actions by introducing new initiatives for supply and demand management. It is appended to the AMPW and should be read in conjunction with the Demand Management section.

2.3.1 EFFICIENCIES AND ADVANTAGES

Water conservation is about the efficiency of water use and can be achieved by implementing a variety of practices, techniques and technologies. Many advantages can be gained through implementation of conservation measures, including:

- Delaying or avoiding the need to search for additional bore supplies and developing new infrastructure.
- Efficiently using and preserving the existing water sources.
- Reducing operational costs such as energy, treatment, storage and maintenance costs, and hence the cost to the consumers.
- Maintaining the adopted levels of service in particular in times of peak demand and ensuring that sufficient levels of storage are maintained.
- Mitigate potential effects on ground water reserves which can affect all ground water users.
- To optimise water taken from deep aquifers minimising environmental impacts therefore improving sustainability.

2.3.2 INITIATIVES AND IMPLEMENTATION

Achieving water conservation requires innovative action plans, changes to consumer behavior, new ideas and technology; or improved design or processes to reduce water loss, wastage and water demand.

Through targeting losses within the day-to-day operation of the water sources and supply network, and reducing demands will achieve improvements in water conservation. Maintaining these improvements can extend the use of existing water resources and assist Council with more effective and sustainable water resource management.

By considering other water conservation strategies throughout New Zealand and Australia, Council has developed initiatives that include conservation measures relevant to the roles and responsibilities of local authorities and the community. These initiatives can be applied through supply and demand activities such as:

- water source management
- storage
- monitoring flow and 'Scada' systems
- leak detection
- pipeline and asset management
- pressure management
- speed and quality of repairs
- regulations such as codes and standard
- water restrictions
- water metering
- education and promotion of water conservation

Each initiative can be described in terms of implementation start timeframes, as either a short term initiative (0–5 years) or a long term initiative (5–20 years). The following table shows the implementation time frames for new water supply and demand initiatives:

Activities	**Initiatives**	**Implementation Term**
Water Supply Activities	• Water source management • Flow monitoring and Scada • Leak detection • Pressure management	Ongoing Short and ongoing Ongoing Ongoing
Water Demand Activities	• Regulations • Water metering and billing • Education and promotion	Short Short Short

2.4 WATER METERING

2.4.1 WATER METERING IN THE DISTRICT – 2011

Water meters are currently installed to approximately 36% of all Councils 14,050 (approx) water customer properties. The bylaws require that industrial business, commercial business and properties with a land area greater than 5000m^2 will be metered for their water, or if a residential property has an extra-ordinary usage. As per Table 1 below, metered connections pay a lesser Uniform Annual Charge (UAC) and pay for volumetric usage. All other domestic users pay a UAC only.

Table 1: Water Fees & Charges (2010) and current connection numbers:

Supply Zone	Metered Connections			Unmetered Connections	
	UAC $/annum	m3 rate	Connections	UAC $/annum	Connections
WSZ	$243	$0.78	1,685	$326	4,419
CSZ	$234	$0.76	2,166	$314	702
ESZ	$329	$0.85	1,121	$403	3,917
Total			**4,971**		**9,038**

The pricing structure for metered and un-metered connections is reviewed in the Annual Plan Process.

2.4.2 BACKFLOW PREVENTION

Water meters installed in the Western Bay of Plenty district are fitted to dual-check backflow prevention manifolds, or with a testable backflow device or RPZ. Backflow prevention devices or registered air gaps are used to prevent hazardous material from being drawn or pumped into the public water supply. This can happen either by back-siphonage or back-pressure and applies to both hot and cold water systems.

The enforcement and monitoring of backflow prevention is an essential activity for Council to ensure public health.

The following principal Acts are relevant to the area of backflow prevention:

- **The Building Act 2004 -** This requires that buildings are safe and sanitary and the occupants are safeguarded from possible illness, that backflow preventers are installed at the source of possible contamination.
- **Water Supplies Regulations 1961 -** These require that the public water supply be protected where a cross-connection may contaminate the public water supply. The water services division of Council is responsible for monitoring and enforcement of the regulation.
- **Health Act 1956 -** The Health Act requires that adequate water supplies are provided to communities, and provides for Council "to make bylaws under and for the purposes of this Act for the protection of public health".
- **Health (Drinking Water) Amendment Act 2007 -** The Health (Drinking Water) Amendment Act gives the network water supplier the powers to install backflow prevention devices on the network point of supply on any property that it considers that there is a need to protect that networked system. *Note: there are other Acts, regulations and standards which are also relevant to backflow prevention.*

2.4.3 RECENT WATER METERING PROJECTS

Water meters have been installed over the past 12 months in three coastal communities; Tanners Point, Ongare Point and Te Puna West. The purpose behind this initiative is to encourage water conservation in areas where houses still rely on on-site effluent treatment systems, mostly septic tanks.

Water meters will give the opportunity for residents to consider water conservation measures and reduce the amount of wastewater entering into field tile systems.

We specifically installed a different make of water meter in each community to allow us to compare the accuracy, reliability, maintenance and cost of each. This information will be used as part of the procurement process to help decide which meter (or meters) is (are) best suited and most cost effective for use within the district.

Water meters are being installed in Omokoroa and Maketu during 2011/2012 and are planned to be completed before 1st July 2012. Both of these communities have had (or are in the process of having) wastewater network systems constructed to replace on-site effluent treatment systems. These projects are directly related to improving environmental issues surrounding coastal effluent levels. Another strategic objective of both projects is to reduce waste water volumes by 20%. Hence metering of all water connections in both communities will be essential in measuring water consumption and to help in delivering these targets.

Table 2 below shows the number of meters installed (or to be installed) for each community.

Table 2.

Area	Number of water meters installed (or to be installed).	Supply Zone
Tanners point	103	WSZ
Ongare point	64	WSZ
Te Puna West	133	CSZ
Omokoroa	1130	CSZ
Maketu	550 (approx)	ESZ

These areas will all have bulk flow meters fitted on trunk mains leading into the area to measure supply against demand. The bulk flow meters will be used to monitor low night flows and determine any system leakage.

Collectively, the fitting of meters to all properties in these coastal communities could see reductions in water consumption, water losses and wastewater volumes. These gains will help to improve social, economical, environmental and cultural well-beings for these communities in particular, but also for the district as a whole.

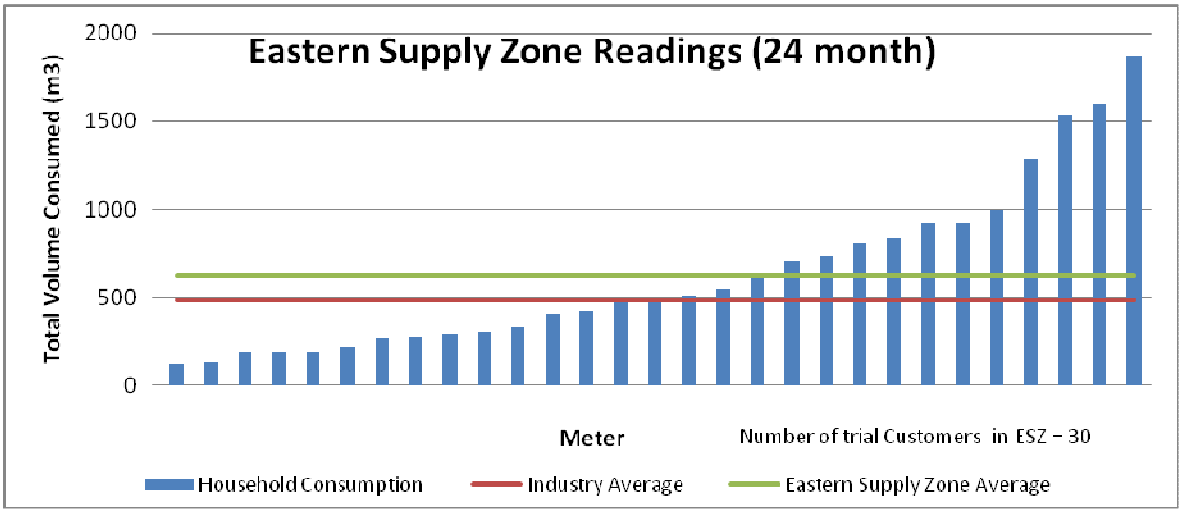
2.4.4 COLLECTION OF FIELD DATA AND ANALYSIS

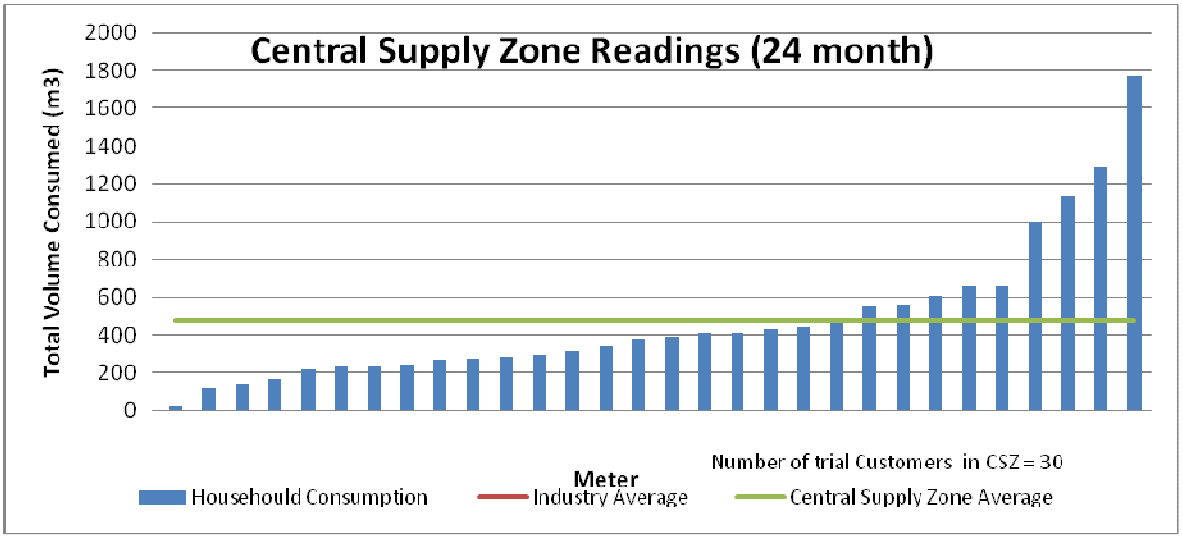
Council funded a 130 Water Meter Trial. The purpose of this trial is to learn more about household water consumption. Council had 130 water meters installed on a random selection of un-metered water connections on properties throughout the district. The properties are spread throughout the Western, Central and Eastern Supply Zones, and in rural and urban locations. The trial was for 24 months and all meters were read each month. The meter readings were collated to show monthly and cumulative household usage.

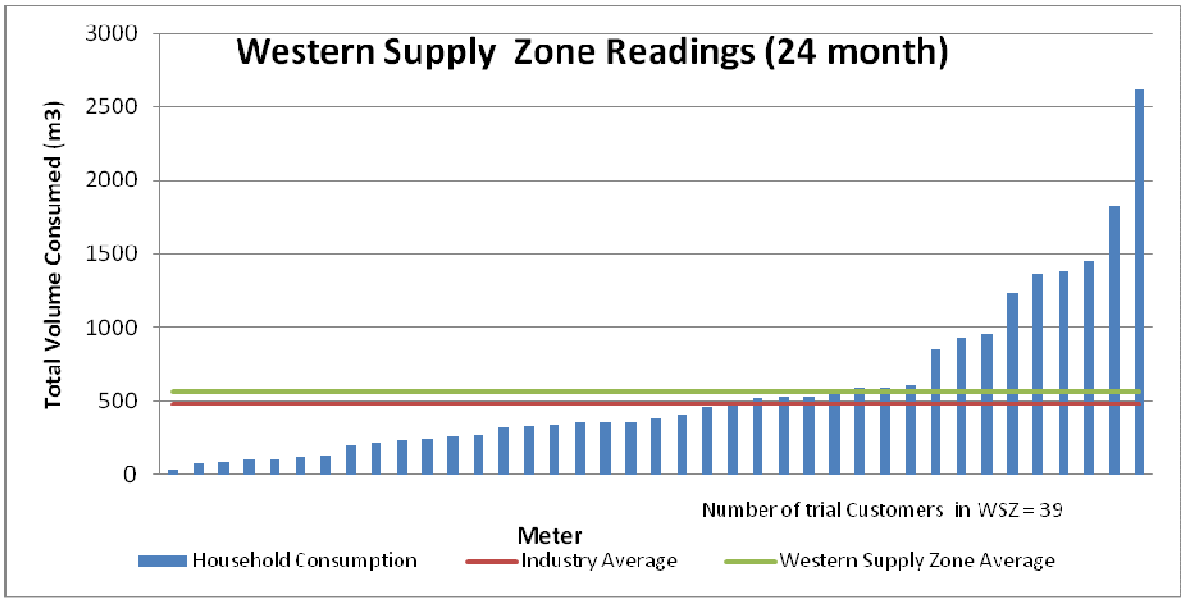
Recognizing the meter trial is a small percentage of the unmetered connections, the results are indicative of water consumption habits. To give the results further context and confidence, we have considered them with the meter reading results from the group of coastal communities; Tanners Point, Ongare Point and Te Puna West. Collectively this is a total of 430 meters (or approximately 5%) of the total unmetered water connections throughout the district.

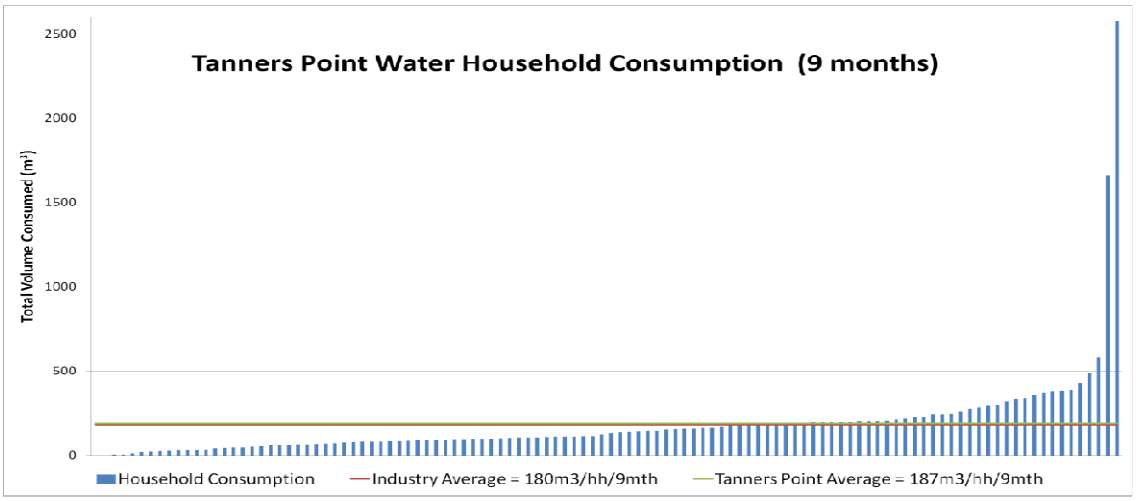
Council considers that nationally the average domestic water consumption rate is recognized as 200 liters/person/day. Based on population and house numbers in the Western Bay district, the average household has approximately three occupants, making the average household usage 600 liters/day. We increased this volume by 10% to allow for the high proportion of rural properties in the district and consider that the average household usage is 660 liters/household/day as referred to in the Development Code.

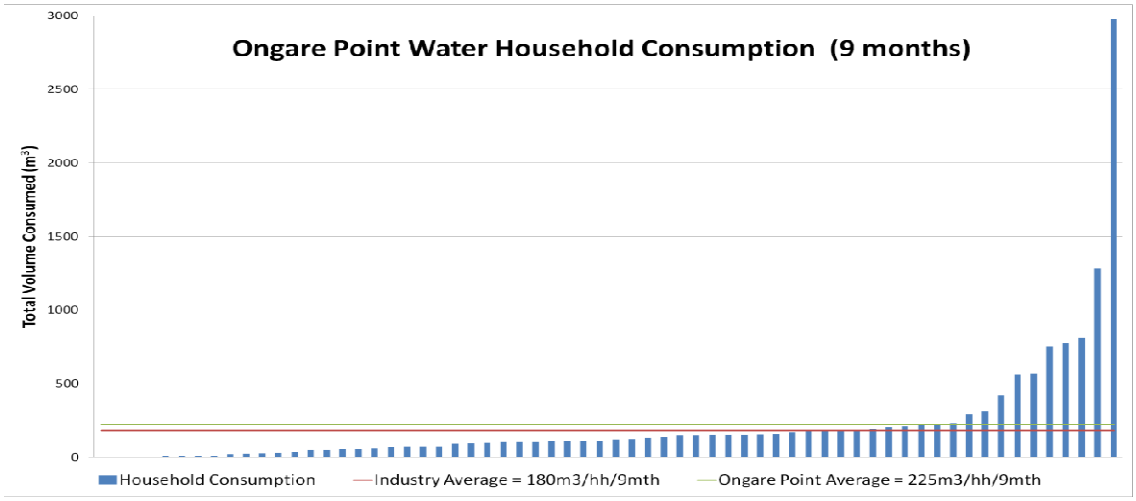
The results for each household's water usage in the meter trial over 24 months, and for the household water usage in the coastal communities; Tanners Point, Ongare Point and Te Puna West over 9 and 7 months respectively, are shown in the following graphs.

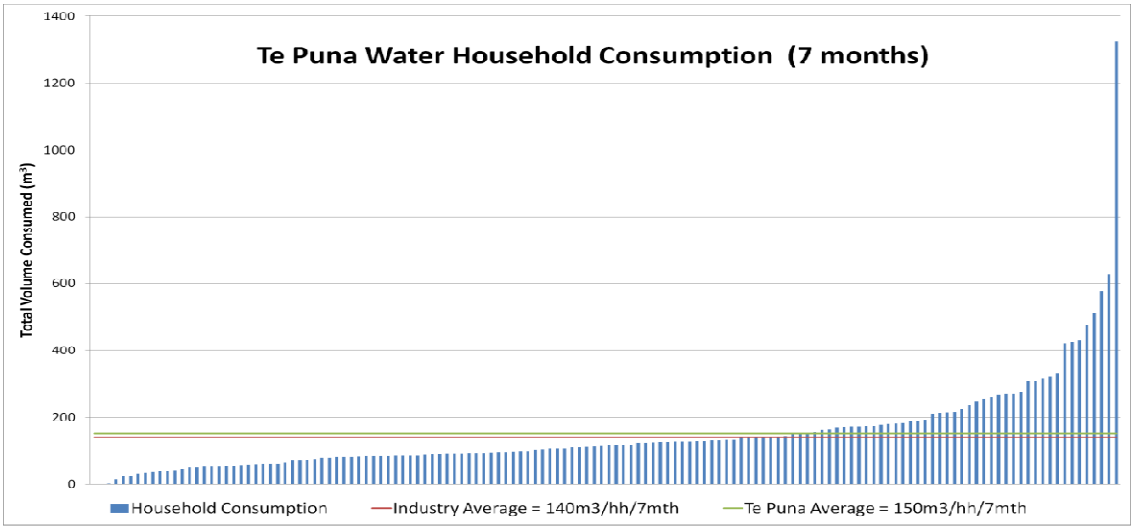












Total metered customers in Te Puna = 133

A survey was carried out to identify how many people live in each of these houses. This information is used to determine the average number of people per household for each area in the survey. The results are shown in Table 3 below.

Table 3.

		% of Houses with number of permanent residents						
	Permanent Residents per house	1	2	3	4	5	6	Average number of persons per house, each area
AREA	Tanners Point 103 Houses	16%	75%	6%	3%	0%	0%	**1.9**
	Ongare Point 64 Houses	15%	52%	15%	11%	7%	0%	**2.4**
	Te Puna West 133 Houses	13%	43%	20%	20%	3%	1%	**2.6**
	Trial Western 49 Houses	6%	40%	16%	16%	16%	6%	**3.1**
	Trial Central Supply Zone 39 Houses	4%	73%	15%	4%	4%	0%	**2.4**
	Trial Eastern Supply Zone 40 Houses	12%	25%	17%	29%	13%	4%	**3.3**
	Average % across Areas	**12%**	**50%**	**15%**	**15%**	**6%**	**2%**	**2.6**

When we consider the number of people that reside in each of the houses and the household daily consumption, we can derive the average water usage per person per day. To give these results some context, we have compared them to Councils Development Code standard usage of 220 liters/per person/per day and as a percentage comparison. The results are shown in Table 4 below.

Table 4.

	Water usage					
		Average # persons per household	Average Household Daily Usage litres / day	Average Person Daily Usage litres / day	Industry Average Person Daily Usage litres / day	% Usage of Industry Average
AREA	Tanners Point	**1.9**	679	357	220	162%
	Ongare Point	**2.4**	821	342	220	155%
	Te Puna West	**2.6**	704	270	220	123%
	Trial Western	**3.1**	776	250	220	114%
	Trial Central Supply Zone	**2.4**	663	276	220	125%
	Trial Eastern Supply Zone	**3.3**	864	261	220	119%
	Mean result across all areas	**2.6**	**763**	**293**	**220**	**133%**

The household water consumption graphs typically show the significant variation in water usage for each house across all trial meter groups and the coastal communities. The household resident numbers in Table 3 show that 50% of the houses surveyed have two permanent residents and the 'mean' is 2.6 residents per house for all areas. This is slightly lower than expected and may reflect the number of retirement or holiday homes within the coastal areas.

The daily water usage per person across the areas averages at 293 liters per day or 133% of Councils Development Code average of 220 liters/per person/per day.

The water meter trial had been underway for 24 months as at August 2011 and the coastal community's data goes back 9 and 7 months respectively. Taking all of the results into account indicates a usage trend of approximately 15% higher than the benchmark, approximately 763 liters/per household/per day.

This data should not be over-analyzed or taken as an accurate representation of household water consumption for the entire district. However the results do indicate that average water consumption is higher than the design criteria and unaccounted for water throughout the district is not as high as estimated in previous water balance exercises. This is supported by statements in the AMPW which suggest that until district wide water metering is in place, it is very difficult to accurately calculate water losses.

2.4.5 ADVANTAGES OF DISTRICT WIDE WATER METERING

Water metering is the single most significant demand conservation initiative in place due to its far reaching effect and the ranges of conservation measures it can address.

- Water customers are more aware of consumption by volume as the tariff structure aligns with the 'user pays' philosophy, hence: 'the less you use, the less you pay'.
- Water meters quickly identify if there is a continuous flow into a property, and pro-active actions can be taken to address water losses.
- Meter readers can identify extra-ordinary usage and notify the customer through a mail drop.
- Provides true and accurate measurements for the area and district water balance investigations in the network, carried out in conjunction with bulk flow metering or night flow measuring initiatives. Identifies what are real losses and authorised consumptions.
- Provides qualified usage data for demand forecasting.
- Usage trends can help identify customers where other water conservation measures may need to be introduced, such as pressure management.

Reduction in Water Demand – the implementation of universal water metering can result in a reduction in peak demand of up to 25%, with average demand reducing by about 20%. We can reflect on Tauranga City's experience which highlights the reductions in peak and average daily demands following the completion of district wide water metering. Over the past 10 years Tauranga City have realised financial benefits as a result of the installation of water meters. This is well documented in their "Water Metering – The Tauranga Journey".

Reduced Wastewater - coupled with the reduction in water demand there is a corresponding reduction in wastewater volumes generated. This decreases the volume of wastewater that needed to be conveyed and treated results in operational savings which also delays the need to upgrade infrastructure in the wastewater treatment and collection systems. This alone had a significant impact when considering the renewal of the discharge consent for the three Western Bay of Plenty District Council wastewater treatment plants.

Regional Council identified Ongare Point, Tanners Point, Te Puna West, Omokoroa and Maketu as areas that posed a risk to water quality by onsite wastewater systems. These areas were deemed as maintenance zones and would require the community to either upgrade to an advance septic tank or connect to a Council sewage scheme before the designated date. This led to the construction of the Omokoroa and Maketu wastewater schemes to assist the communities to meet Regional Council requirements. There is an aim within the Western Bay District to reduce the contaminants entering the harbor and therefore remove these communities from the maintenance zones.

2.4.6 OPTIONS – IMPLEMENTATION PLAN

Currently Council has included a budget in the 2009-2019 LTCCP for the installation of water meters throughout the district. The funding is portioned into each of the three supply zones over six years, commencing in 2012/2013 year and finishing in year 2017/2018. Some funds have been brought forward for the installation of water meters in Maketu this year, corresponding to the construction of the Maketu/Little Waihi Wastewater Scheme.

Staff reviewed the options to staging of District Wide Water Metering, with the suggested timeframe:

- Install meters in the Central Supply Zone first in year 2012/2013 as there will only be approximately 700 installations to complete the zone after the current meter installations in Omokoroa Peninsula are completed by 1st July 2012.
- Secondly, install meters in the Eastern Supply Zone in years 2013 – 2016. There are approximately 3,400 installations to be done (taking into account the 550 in Maketu that will be completed) and the Eastern Supply Zone has the highest per household usage of all three zones.
- Finally, install meters in the Western Supply Zone in years 2016 – 2018. There are approximately 4,400 unmetered connections.

This option has benefits by shifting the capital costs further out with the greater portion of funding being required in the final three years of the project (see table 5 below).

Table 5.

For year ending	2009 – 2019 LTCCP (Current) $	2012 – 2022 LTP (Proposed) $
2012	240,000*	240,000
2013	760,000	332,000
2014	1,000,000	617,000
2015	1,000,000	617,000
2016	1,000,000	617,000
2017	1,000,000	1,044,000
2018	1,000,000	1,044,000
Total	**$6,000,000**	**$4,511,000**

*funds bought forward through Annual Plan for Maketu metering.

This total also includes a 5% contingency to replace a portion of some existing metering. Costs per install for the 2012 – 2022 LTP budget have reduced significantly from the 2009 – 2019 LTCCP budget due to improved asset information and by reviewing methodologies for installations and procurement.

A second benefit of the proposed implementation plan is the simplification of the logistics associated with:

- The meter construction programme
- The meter reading programme
- The water billing process

Tauranga City Councils Universal Water Metering project adopted a similar approach by progressively moving through the cities 30 stages, completing each stage before moving onto the next. This meant that construction was contained to one area at a time which rationalised project overhead costs.

2.4.7 FINANCIAL IMPACT

During the 2009-2019 LTCCP Process Council approved/adopted district wide water metering be implemented over a six year period commencing in 2012/13 with a total budget cost of $6 million spread over the three supply zones.

In the next 20 years the asset management plans have identified the need for new bores and reservoirs to cater for future demand in the district. The capital works is estimated at $13.25 million.

It is anticipated that universal water metering once implemented, the average water usage is likely to be reduced by 20%. This would then enable the capital works programme to be deferred by three to five years resulting in savings of debt servicing of approximately $4,900,000 over a 20 year period.

It should be noted that the assumptions and projections in this financial analysis exclude savings resulting from less tangible benefits which are generally more difficult to quantify, for example:

- Additional or upgraded water and waste water infrastructure to cater for the District's increased volume throughput under the "without water meter" scenario.
- Capital expenditure associated with additional service reservoirs to cater for the increased storage needed to meet water storage levels of service based on average daily demands.
- Reduced competing demands for water where water resources are constrained. The Bay of Plenty Regional Council requires Western Bay of Plenty District Council to demonstrate good management of existing water resources as part of applications for future water take consents.
- Meeting Council's obligations regarding sustainable water management as required by the Resource Management Act.
- Reduced environmental impact through treated effluent discharge back into the environment.
- Improved understanding and measurement of system water losses and dealing with water leaks when these escalate to an unacceptable level.
- The social impact of water restrictions and the policing of community compliance.
- The social impact of a fair system of water billing and the reduction of cross subsidization.

With the current rates for water meter installations at Tanners Point, Ongare Point, Te Puna West and Omokoroa at an average cost of $450 per connection, we have revised our cost estimate for the district wide water metering for the upcoming LTP (2012-2022) process. As per Table 1, Council has 9,038 unmetered customers. Based on installation costs of $450 per connection the total revised cost would be $4,511,000 (including a 5% contingency to replace some existing rates) instead of $6,000,000.

3 CONCLUSIONS

As a Water Supply Authority there are many drivers at National, Regional and Local levels that give direction to Council for the conservation, use and sustainable management of drinking water for current and future generations. Council recognizes that it's planning and management of the water supply is fundamental to its ability to continue to deliver the agreed levels of service for a quality water supply and cater for growth and demand.

The initiatives outlined in the AMPW Demand Management Plan and The Water Conservation Strategy once implemented can achieve reductions in water losses and increase the overall efficient use of water sources. With demand from users moderated and system losses minimized, capital expenditure projects can then be deferred realizing in tangible financial gains.

The installation of water meters is a viable water conservation initiative for the Western Bay of Plenty District Council. Water meters are a pivotal tool to allow for accurately measuring usage, calculating losses and predicting future demand.

It is important to remember "You can't manage what you can't measure".

ACKNOWLEDGEMENT

Thank-you to all members of Councils Utilities and Asset Management team.

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