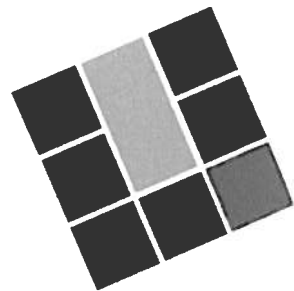


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CITY OF MERRITT

Universal Water Meter Implementation

Phase 1

Final Report



0521.0189.01 / March 2008

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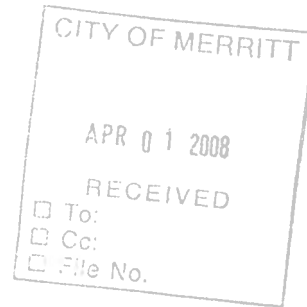


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March 31, 2008

File: 0521.0189.01



COPY

City of Merritt
2185 Voght Street
MERRITT, BC V1K 1B8

Attention: Jennifer Bridarolli, CAO

RE: UNIVERSAL WATER METER IMPLEMENTATION PROGRAM - PHASE 1
FINAL REPORT SUBMISSION

Please find enclosed four (4) copies of the City of Merritt Universal Water Meter Implementation Program
- Phase 1 - Final Report.

This submission marks the completion of Phase 1 of this program, and we look forward to launching
Phase 2.

Should you have any questions, or require anything further, please do not hesitate to call me or Brian
Hobbs. It has been a pleasure working with you on this project.

Yours truly,

URBAN SYSTEMS LTD.

Thérèse Zulinick MCIP
Project Leader

Brian Hobbs, P.Eng
Senior Advisor

/taz

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Appendix A – Open House Panels – March 12, 2008

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1.0 INTRODUCTION

The City of Merritt has been very proactive in promoting water conservation within the community since the early 1990s, and completed a *Water Conservation Strategy* in 2003, from which water conservation efforts have been based in recent years. However, the City is interested in exploring ways to take water conservation to the next level through the implementation of a universal water metering program.

Based upon the experiences of other communities, water meters have proven to be a very effective method for achieving water conservation. In addition, meters provide the only practical mechanism for the equitable allocation and collection of the true costs to purvey water. Demand reduction in the general range of 15% to 30% has been experienced in other BC and Canadian communities. Given Merritt's hot, dry climate, results at the lower end of this scale appear most likely. None the less, due to the relatively high water use rates in Merritt, this may represent a significant reduction in total water use and potentially the associated operation and maintenance costs.

The report represents Phase 1, the first step of a five phase program, to provide direction for the City to implement a universal water metering program. The following outlines the anticipated phases:

Phase 1 – Establish the Rationale for Metering in Merritt – assess the current situation in Merritt and provide groundwork for decision making and a cursory cost-benefit analysis to equip the City to embark on a preliminary public consultation program. Phase 1 includes: researching water metering across the country, specifically in communities with characteristics similar to Merritt; presenting the results to the City; and discussing the implications for Merritt to help make a decision about how to move forward and ensure implementation is successful.

Phase 2 – Determine the City's Approach to Implementation – research and provide information on the approaches to implementing the various facets of water meters ranging from supply and installation of the meters, to financing these activities, to reading the meters and even perhaps providing billing and collection services. The approaches to implementing each of these activities could range from exclusively public to exclusively private or a combination of the two. If appropriate, this phase will involve assisting the City in undertaking a Request for Expressions of Interest to invite the private sector to provide information on potential approaches and costs. Depending on the approach and implementation method selected, this phase will also include defining the scope and requirements for a Request for Proposals, implementation contract or other implementation processes based on Council's direction for moving forward.



Phase 3a – Implementation – prepare necessary documents for the implementation process from Phase 2, and assist with the evaluation of submissions and selection of the preferred proponent/supplier/contractor as appropriate.

Phase 3b – Rate Structure Study – resolve a cost recovery approach that reflects the true costs to be recovered, the cost of providing the service, and other City objectives such as being a driver of further water conservation. A variety of rate systems (i.e. graduated or all at once) will also be examined. The establishment of the rate structure is a critical component in the successful implementation of the water metering program, and as such, needs to be approached comprehensively to avoid unintended consequences (i.e. ensuring fairness to all, considering revenues over the life of the program, etc.)

Phase 4 – Installation/Implementation – depending on outcomes of Phase 2, 3a and 3b, roles and responsibilities will be defined as well as the scope and focus for developing a program for engaging the public.

Phase 5 – Ongoing Operation – depending on outcomes of Phase 2, 3a and 3b, roles and responsibilities will need to be defined for the ongoing operation, maintenance, meter calibration (which will depend on how Measurement Canada's new policies are implemented), as well as reading, billing, collections, etc.

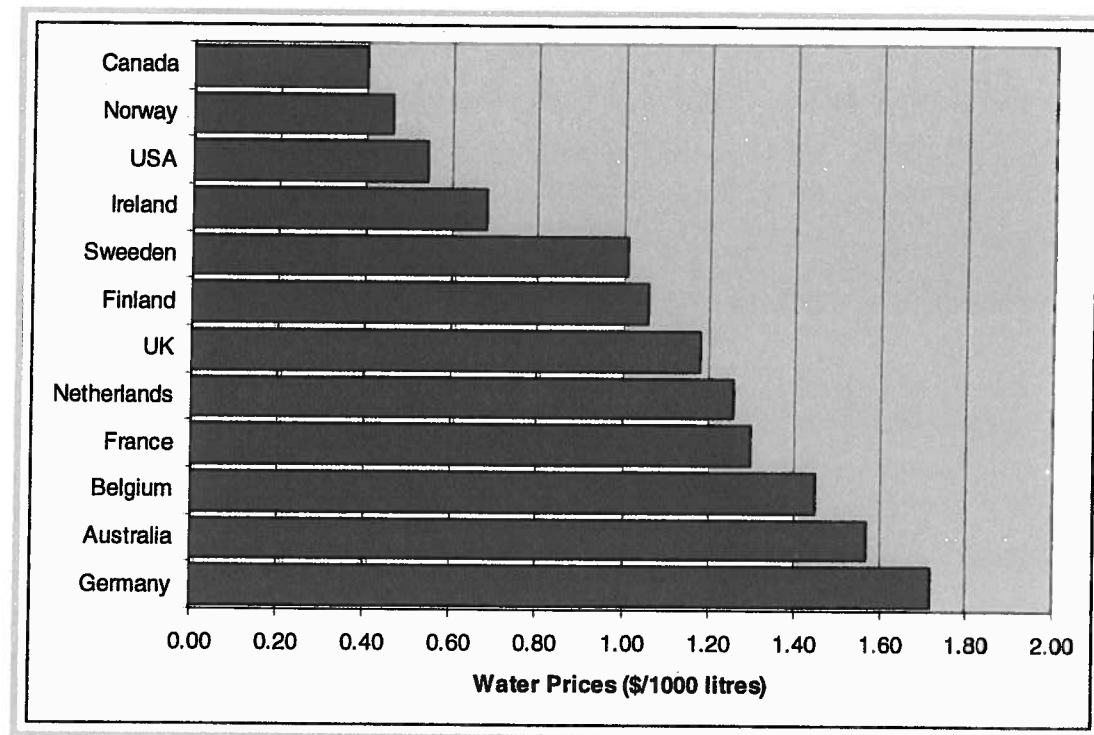


2.0 JUSTIFICATION FOR UNIVERSAL WATER METERING

Fresh water supplies are a global concern; water is becoming more expensive to extract, treat, and distribute. Although Canada has one fifth of the world's supply of fresh water, only 10% is renewable. Between 1972 and 1991, Canada's rate of water consumption almost doubled despite a population increase of only 5%. In Canada, water treatment and distribution are under-priced and water infrastructure is under-funded. In fact, Canada has one of the lowest water prices of all developed countries despite consumption levels being among the highest in the world. Figure 1 compares typical municipal water prices throughout the world.

Figure 1: Municipal Water Prices

(prices in 1992 Canadian dollars)



Low water prices are not a result of lower supply costs, but because water prices are heavily subsidized. Government subsidy will not continue indefinitely, so rates will invariably increase. Already, the cost of water in Canada, which has remained relatively stable in the past, has increased beyond the national rate of inflation. Similarly, BC hydro rates have remained relatively stable over the last 10 years compared to Canada's electricity rates which have been increasing steadily. Electrical rates are inevitably going to swell in response to the national average and, consequently, since the main variable cost in water consumption is power, water rates will inevitably increase.



Instead of reacting to future crisis situations as a result of changing water prices, municipalities should be proactive and reduce potential problems by encouraging water conservation today and recovering the true costs to purvey water.

Water conservation is important because we rely on this essential resource for survival and also because we have a moral responsibility to ensure environmental stewardship and sustainability for future generations. To encourage water conservation and efficient use on a per home basis, a number of different water consumption tracking methods can be used. Municipalities can introduce initiatives such:

- water use restrictions;
- regulations;
- flow control devices;
- water recycling systems;
- water metering;
- changes in pricing;
- incentives and rate structures.

Municipalities can also improve water efficiency by minimizing losses within municipal distribution systems, where poorly maintained systems can lose close to 30% of water due to leakages or other unaccounted-for losses.

There are three universal metering tools that can be used to track water consumption. The first tool is *source-water metering* which involves directly metering and reading all wells regularly. By monitoring the water being extracted from each well, the system can track water extracted from the source. However, this data does not provide the amount of water delivered to or consumed by the end user. The City of Merritt currently has meters on all City wells which are read daily; however, meter accuracy needs to be verified periodically. The golf course and perhaps some individual properties may have irrigation wells which draw water from the same aquifer as the City wells. It would not have been common practice at the time these wells were developed to provide a meter in order to record the volume of water pumped.

The second tool is *service-connection metering*. This type of metering is used to read residential, commercial, and industrial consumers. Currently, some commercial users in Merritt are metered while several residents have meters that are not read. By installing and monitoring meters on all homes, commercial, and industrial facilities, use can be more accurately recorded and billed. In addition, volume-based rates ensure higher water consumers are charged appropriately and



enable better tracking of use based on various sectors and users within Merritt. For example, this method would enable the City to identify large water users and work with them directly to examine water use on a more detailed level. This way, the City will be able to have a greater impact on reducing unnecessary water waste.

Finally, *public-use water metering* can be used for municipal accountability. Merritt does not have any meters in place for parks and other public facilities but may want to consider them to monitor water usage in public spaces. The City is making efforts to reduce consumption through the use of a new Toro Sentinal Irrigation system. This project is in the second phase of changing the automatic sprinkling systems in City parks to a weather-related system that monitors rain, adjusting sprinkling times accordingly as well as providing notification of broken heads. Metering these facilities will help determine where alternate water supplies would be appropriate and how additional retrofits could be introduced.

2.1 Equity

The implementation of a metering system is an effective way to reduce overall water consumption and maintain reasonable rates. A universal metering system means that non-metered water consumption – charging people at a flat rate – is replaced with a volume-based system where each user is monitored and they pay for the water they consume.

Water is a limited commodity. When consumers pay for water services in proportion to their individual use of the system, this provides a more equitable way of recovering costs. Water meters utilizing user pay rate structures are the standard for other commodities such as electricity, natural gas, and fuel. A similar philosophy can be adopted at a municipal level to implement a full cost recovery management plan for water treatment and distribution, and wastewater treatment and collection. For example, with a flat rate system, if a small water conscious family of four uses less water per day than a larger or less water conscious family, both families will pay the same even though it costs more to provide water for the latter family. A volume-based rate system would use water meters to monitor consumption and charge users based on the amount of water they actually use. Ideally, incentives are built into the rate structure to ensure low volume users are charged less than large volume consumers. Presenting this philosophy for rate structures to the public at the beginning of the water meter process will show that the City is committed to equitable solutions.

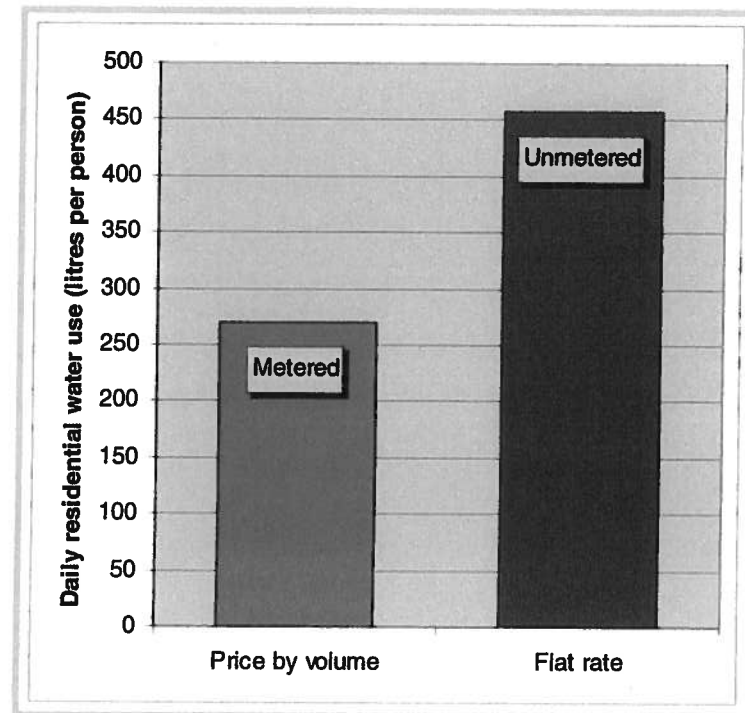
2.2 Actual Water Use – Metered vs. Non-Metered Communities

Over half of Canada's municipalities use water meters and a volume-based rate system while the other half use a flat rate system. On average, flat rate customers generally use 50 to 60% more



water than metered customers. Unmetered customers use 457 litres of water per capita per day compared to volume based customers who only use 269 litres per capita per day, based on statistics from 1,266 municipalities in Canada. Figure 2 below illustrates the difference in average daily consumption.

Figure 2: Metered versus Unmetered Daily Water Use – Canadian Average



Canadian communities generally use significantly more water if they have a non-metered water system. As such, use patterns are distorted or poorly understood which inevitably leads to municipalities subsidizing waste and misuse of water resources. Survey results from Environment Canada indicate that people living in larger communities use less water, and are almost twice as likely to be equipped with water meters, than those living in smaller towns. Figure 3 below shows a breakdown of metered versus unmetered systems based on municipal size – from a sample of 1,358 Canadian municipalities. In all cases, residential water use is significantly lower when meters are being used.

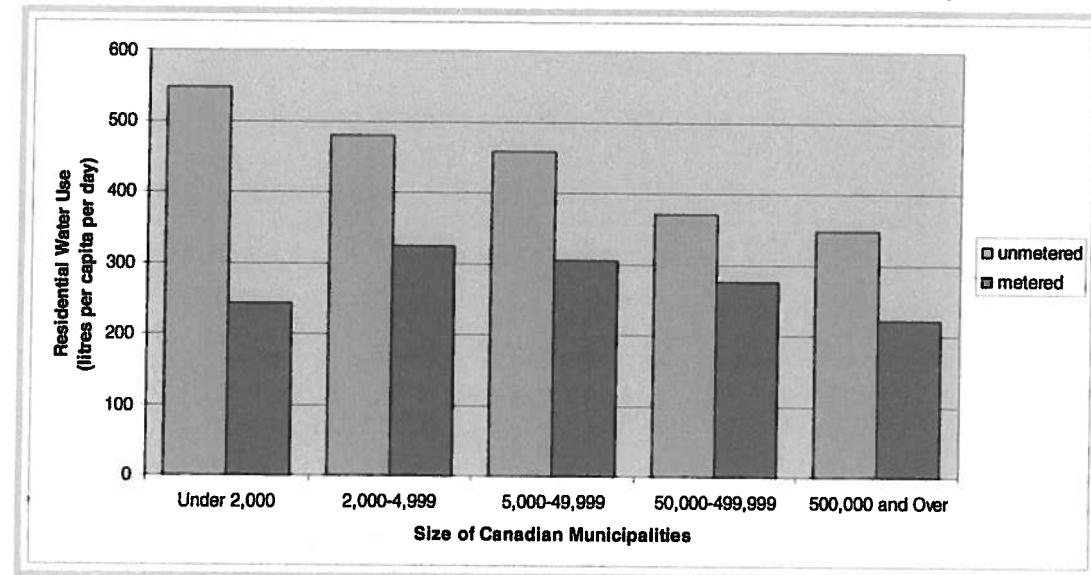
2.3 Costs and Benefits

Universal water metering enables municipalities to optimize the design and phasing of future capital works. In fact, capital expenditures can be deferred and, in some cases, minimized based on the water use reductions achieved by the introduction of volume-based metering. This can result in reduced capacity needs (i.e. sizing of reservoirs and pipes, etc.) as well as delay or even



avoid the need for capital upgrades or new works. For example, rather than spending additional money on future wells, funds could be redirected towards leak detection. In addition, reduced water use will decrease operations and maintenance costs (i.e. reduced operating time for pumps and associated electrical costs, wear and tear on the system as a whole, and in the future, chlorination costs based on volume of water to be treated).

Figure 3: Unmetered and Metered Residential Water Use by Municipal Size



Water metering will also enable the City to lead by example in accounting for municipal water use to service City facilities and parks and understanding the true costs to provide water. This in turn will then enable the City to evaluate and efficiently manage water use. For example, in the case of park watering, once the City has a clear sense of the cost to water parks, the City could consider cost-benefit options to reduce these costs. This could include changing grass types, for instance to reduce watering needs, or considering opportunities for dedicated, untreated water sources (i.e. wells) within larger parks such as Central Park (given the aquifer is so close to the surface in many areas of Merritt).

Reduced water use will also result in significant energy savings since water and sewer are the major consumers of energy in the City. In fact, the City's sewage treatment plant represents the largest individual user of electricity by the City. With the implementation of water meters, it is anticipated that the City could see yearly electrical savings in the range of \$20,000.

Section 5 provides an estimate of the savings that could be realized with the introduction of a universal metering program.



2.4 Availability of system information and data

Today, many municipalities have very little data available on their water system. The introduction of universal water meters provides more information on entire water and wastewater systems, enabling better analysis and providing more accurate data to optimize design requirements. Data is captured when water is pumped directly from the aquifer and when flows reach the wastewater treatment plant, but the system does not have the capability to collect data between these points. Given the data capture methods available with universal water metering, the City would be better able to understand water use/demands based on specific locations within the community and based on types of users. As such, upgrades to existing infrastructure or design of new infrastructure could be optimized to meet real versus assumed demands. This will be particularly important as development continues to move up the hillsides to higher elevations within Merritt. Due to the need for additional infrastructure to service hillside development (i.e. reservoirs, booster stations, additional piping, etc.), providing water to upland areas is more costly than low land development.

Universal metering also provides the opportunity for enhanced leak detection and the ability to quantify the magnitude of leaks both on the "City-side" of the meter as well as on the "end-user" side of the meter. This provides the ability to detect the magnitude and location of leaks to identify where inefficiencies exist. This will be particularly important in determining proximity of leaks with respect to the aquifer and analyzing risk of water leaking from the system and infiltrating into the aquifer. This will be of significant concern in protecting the aquifer especially when water is to be treated in the future (i.e. chlorination).

With the potential for system information and data capture, fiscal planning and decision making will also be better informed both in the short and long terms. This will provide valuable information in determining and targeting where infrastructure deficiencies exist and assess the timeline necessary for upgrades or new construction.

The data will also be useful in preparing grant applications. Both the federal and provincial governments have stated that priority funding will be awarded to those communities demonstrating environmental stewardship in their planning and day-to-day practices. The introduction of universal water metering would provide an opportunity to demonstrate Merritt's commitment to the environment and potentially result in greater capital funding from senior levels of government.

In addition, meters enable the City to identify and analyze large volume water users and engage those users in discussions about water conservation. This provides the opportunity to have the greatest effect in reducing overall water use and assist the City in determining where their efforts



are best allocated in promoting water conservation. For example, working with one large water user could have the same impact (or greater) when compared to handing out numerous watering infractions to a large number of relatively smaller scale users (i.e. residential or commercial). In the absence of water use data, this is currently difficult for the City to do.

2.5 Public Acceptability

Education, information, and meaningful consultation will encourage greater public acceptability. Without adequate information, the public will lack the tools necessary to make an informed decision. A public open house was held on March 12, 2008 to begin educating the public about water meters and to understand their concerns. The results of this open house are presented in Section 6 and Appendix A.

Past experience has indicated that when the public is engaged early in the process, later stages of the implementation program are more easily facilitated. This includes involving the public early on in the City's initial consideration of universal water metering all the way through to installation and ultimately aiding the public in realizing the benefits of water meters. This means providing the information necessary to allay the fears of naysayers. Criticism around water meters often centers on the rate structure and the disruptions of the installation process. In municipalities where this information has not been provided up front, residents have not been supportive. At the early stages in the public consultation process, this will mean communicating Council's commitment to a rate structure that promotes equity, assuring the public that the City will do its best to ensure the installation process is not disruptive, accounting for the City's own use of water, and such. The level of detail provided to the public on these commitments will increase as the program develops over time and will encourage broader support of the implementation program.

Once installation of a service-connection metering system is complete, individual customers will be better informed about how much water they use, and therefore provide a tool for personal water conservation goals to be measured. Tangible results about residential water use will provide a rationale for participating in a variety of other water efficiency measures such as installing low-flow fixtures and modifying landscape practices.

2.6 Environmental Responsibility

The promotion of environmental stewardship can increase the community's understanding of environmental challenges and the implications of personal conservation. Firstly, the implementation of water meters in and of itself demonstrates the City's commitment to protecting the City's vulnerable and highly relied upon aquifer. Universal water metering will enable the City



to better detect leaks throughout the system, and therefore reduce the risk of treated water infiltrating the aquifer. Secondly, water meters are a key tool in taking water conservation efforts from a promotional exercise to a highly effective implementation program. For example, water meters provide direct feedback in terms of actual water use and thereby, coupled with an appropriate rate structure, ensure the community becomes more conscious of their actions resulting in reduced water use.

Reducing water use in Merritt will increasingly become a critical issue. Climate change is predicted to result in hotter, drier conditions, which will not only directly affect the amount of water used, but also the needs of other users and the aquifer itself. Given that there are still many unknowns about the influence of the Nicola and Coldwater Rivers on the aquifer, it is not known what effect these climatic changes may have on the aquifer especially if it is directly under the influence of these rivers.

Reduced water use also translates into reduced flows to the sewage treatment plant, as well as energy savings from unnecessary water pumping, distribution and treatment.

2.7 Water Meter Implementation in Other BC Municipalities

The experiences of specific Canadian communities indicate that meters combined with an appropriate volume-based rate system are effective in reducing water use. Table 1 below indicates this comparison with examples from communities in Alberta, British Columbia, and Ontario.



Table 1: Demands in Metered and Unmetered Systems in Canada

Municipality	Demand (Litres per capita per day)	
	Average Day	Maximum Day
Metered		
Chatham, ON	510	1025
Dawson Creek, BC	586	972
Edmonton, AB	480	830
London, ON	475	530
Ottawa, ON	555	875
South Peel, ON	485	785
Vernon, BC	590	1300
Average Metered (rounded)	526	902
Unmetered		
Calgary, AB	765	1435
Chetwynd, BC	683	1127
Hamilton, ON	1055	1570
Kamloops, BC	820	2050
Merritt, BC ¹	1218	3661
Niagara Falls, ON	680	1250
Peterborough, ON	820	1500
Vancouver, BC	690	1525
Average Unmetered (rounded)	841	1765

Kelowna, Vernon and Kamloops are similar to Merritt with respect to climate, built environment, lifestyle and efforts to encourage water conservation education and awareness in recent years. The experiences of these three municipal water programs are described below to provide examples of approaches to water meter implementation programs in the BC Interior. Chetwynd has also been included as this is one of the more recent municipalities to begin introducing water meters within the past year in the BC context.

¹ Merritt figures represent 2002-2006 data.

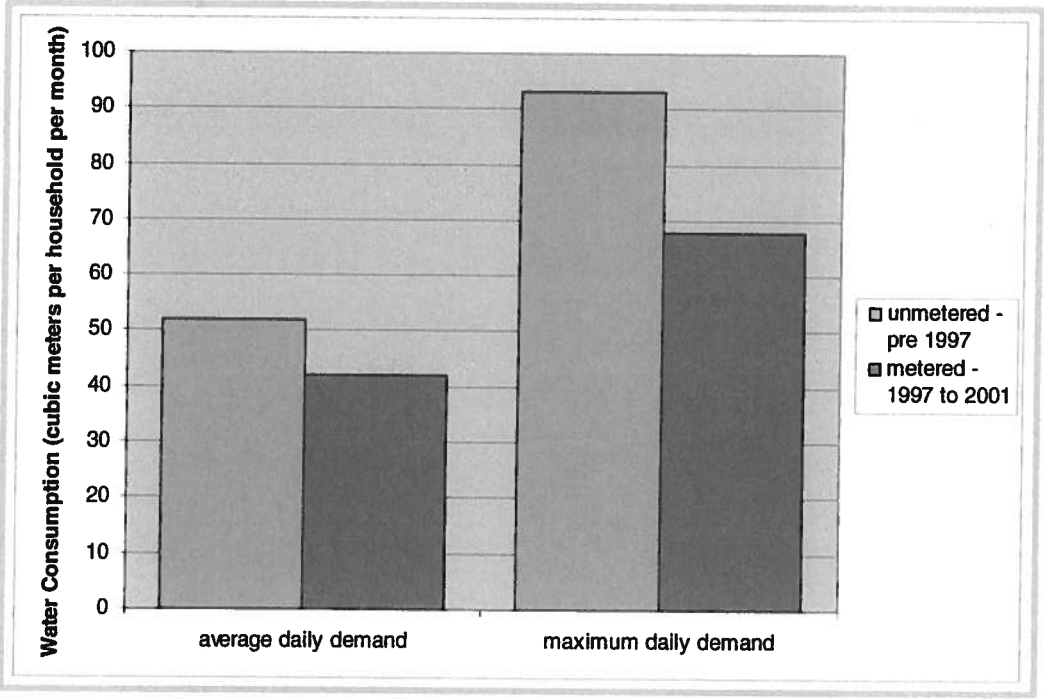


2.7.1 City of Kelowna

Residents in the City of Kelowna consumed an average of 1,000 litres per capita per day of water in 1997, one of the highest rates in North America. Kelowna decided to take a two-pronged approach to water conservation by using a water smart education program along with universal water metering. In 1997, the City completed the installation of water meters and the next year started billing residents based on consumption.

By 2000, the universal water metering program was fully in place. A fixed cost plus rate model is used, where there is a base rate per month charged to cover estimated base level water use plus an additional cost per cubic meter for any consumption above the base level. Within the first few years, the City experienced an average daily water demand reduction of 17.6% and a peak monthly water demand reduction of 27%. Figure 4 below illustrates the comparison between consumption with and without a universal water metering system in Kelowna.

Figure 4: Water Consumption in Kelowna

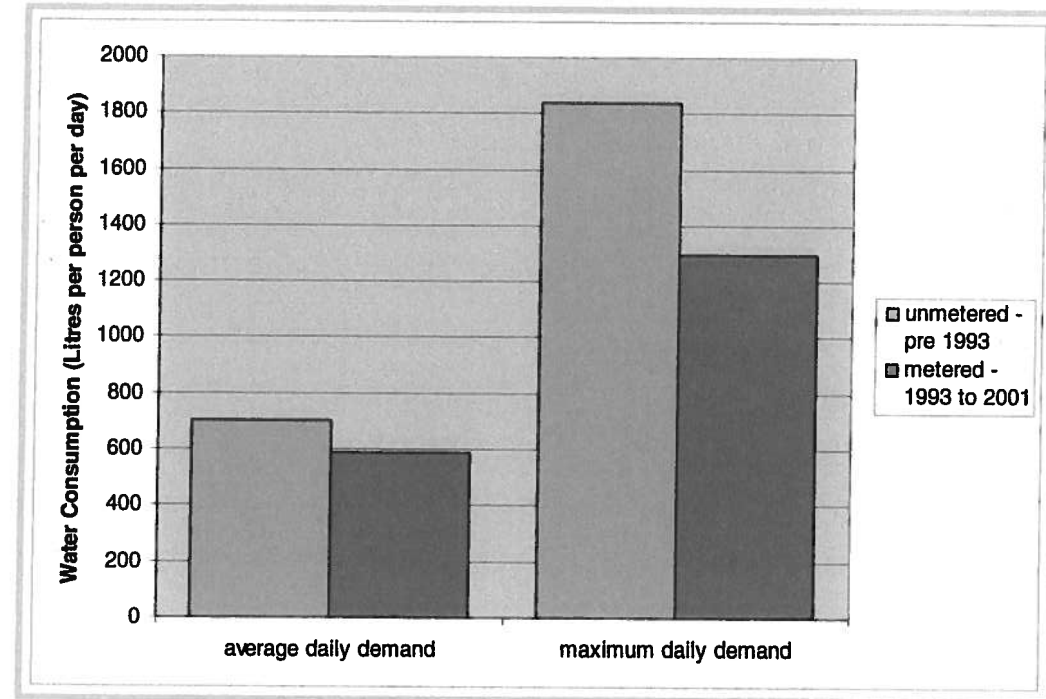


2.7.2 City of Vernon

Vernon completed a universal metering program in 1993 and over the first six years of the program, the average daily and peak daily demands decreased by 15.7% and 29.4% respectively. Figure 5 below illustrates the comparison between consumption before and after introduction of a universal water metering system.

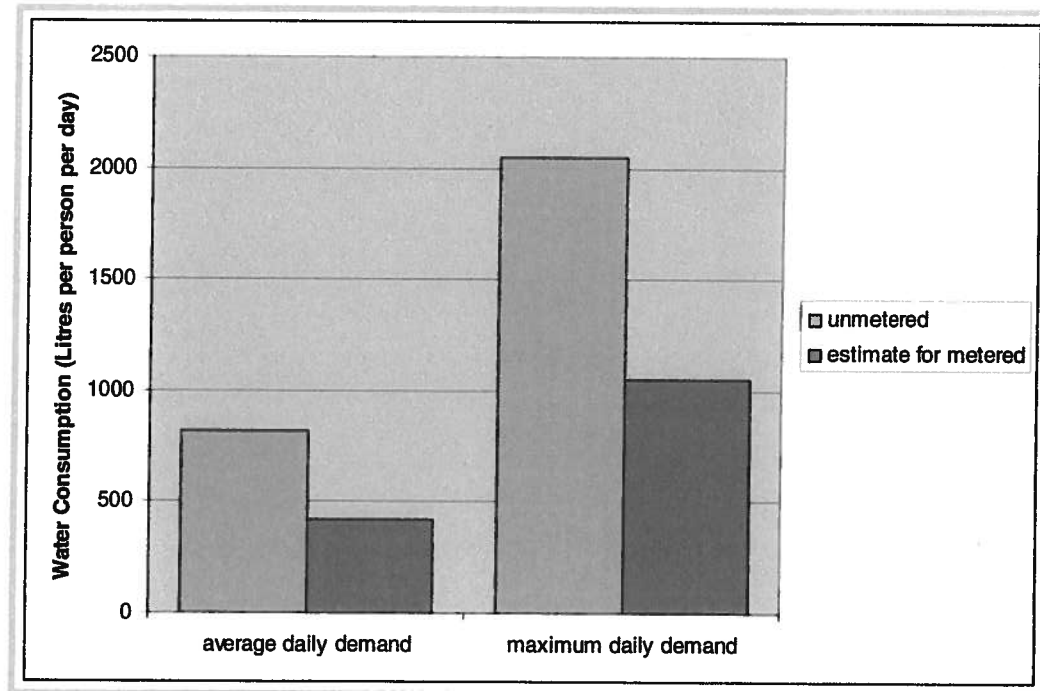


Figure 5: Water Consumption in Vernon



2.7.3 City of Kamloops

The City of Kamloops has one of the highest per capita water consumption rates in the country for a city of this size. After reviewing the costs and benefits of metering, City Council decided to go forward with a referendum to introduce a water meter program in Kamloops in October 2001. Although the program was rejected by the community (63% voted against, 37% in favour), a detailed plan for universal, mandatory water metering indicated that universal water metering was the single most cost-effective method for achieving more efficient water use in the City. Peak water demands, which decreased as a result of the City's aggressive Watersmart program, were projected to decrease by an additional 25% with the shift to a universal water metering program. Figure 6 below illustrates the projected comparison between consumption with and without a universal water metering system.

**Figure 6: Water Consumption in Kamloops**

Meters were projected to cost \$4.3 million to install and \$300,000 per year to operate in Kamloops, and would have provided benefits that outweighed costs by more than 2.5:1. The City projected it would save over \$5.1 million in the costs for water treatment facilities required to meet health requirements, \$500,000 per year in operating costs for the water treatment plant and distribution system, and \$2.5 million in the cost of the wastewater treatment plant upgrades. In addition to these savings, a number of smaller projects such as storage reservoirs could be scaled down in size.

2.7.4 District of Chetwynd

The District of Chetwynd has almost completed the implementation of a universal water meter program using Sensus water meters. The District contracted out the supply and installation but will be doing maintenance and billing in-house.

Most water meters have been installed; however, some challenges have arisen with some remaining sites, specifically:

- a) Refusal by the home owner to have a water meter installed;
- b) Installation complications with the contractor installing the water meter;



- c) Scheduling obstacles with arranging an installation date. This is an important consideration for northern communities as people employed in natural resource sectors often work away from home and could be gone for several weeks at a time.

The District is currently reading the water meters, but not billing yet because they are still waiting for integration of the database with the financial operation system. Also, they have further work to do regarding rate structures and having them reviewed and approved by Council.

2.7.5 Other BC Municipalities

Other BC municipalities have also introduced water metering in the past few years including: Qualicum Beach, Vanderhoof, Nanaimo, Port Alberni and Fort St. John. Chilliwack also introduced a program recently and experienced a significant reduction in water consumption after six months of universal metering. While a target of 25% was anticipated, a 46% reduction was recorded after 24 months of universal metering.



3.0 GUIDING PRINCIPLES FOR MERRITT'S WATER METERING IMPLEMENTATION PROGRAM

The following guiding principles provide direction for the implementation of a customized universal water meter program in Merritt over the coming years. These principles should be observed and respected throughout the implementation program in order to provide the basis for clear thinking, consistency, and ensure long term success.

Education – will be critical at all levels to the success of the program; this includes ensuring Council and staff have the tools necessary to make decisions and that the public is fully informed and meaningfully engaged throughout the process;

Accountability/Transparency – ensure information and decision making is open and well-communicated;

System Management – ensure management of the system is efficient, cost effective and provides meaningful information required to ensure responsible stewardship of the City's infrastructure (including operations and maintenance) and sustainability of the aquifer;

Public Participation and Consultation – encourage public consultation that is meaningful and effectively provides opportunities for feedback from all stakeholders;

Financial Stability – ensure cost recovery is fair and equitable while also ensuring financial sustainability of City's assets, maintenance and operations;

Environmental Stewardship – continue to support and promote the benefits of water conservation for the community;

Lead by Example – ensure the City is demonstrating commitments to water conservation and metering through the actions of the municipality in terms of water use for facilities and parks as well as making efforts to detect and minimize water losses through inefficiencies and leaks in the system.

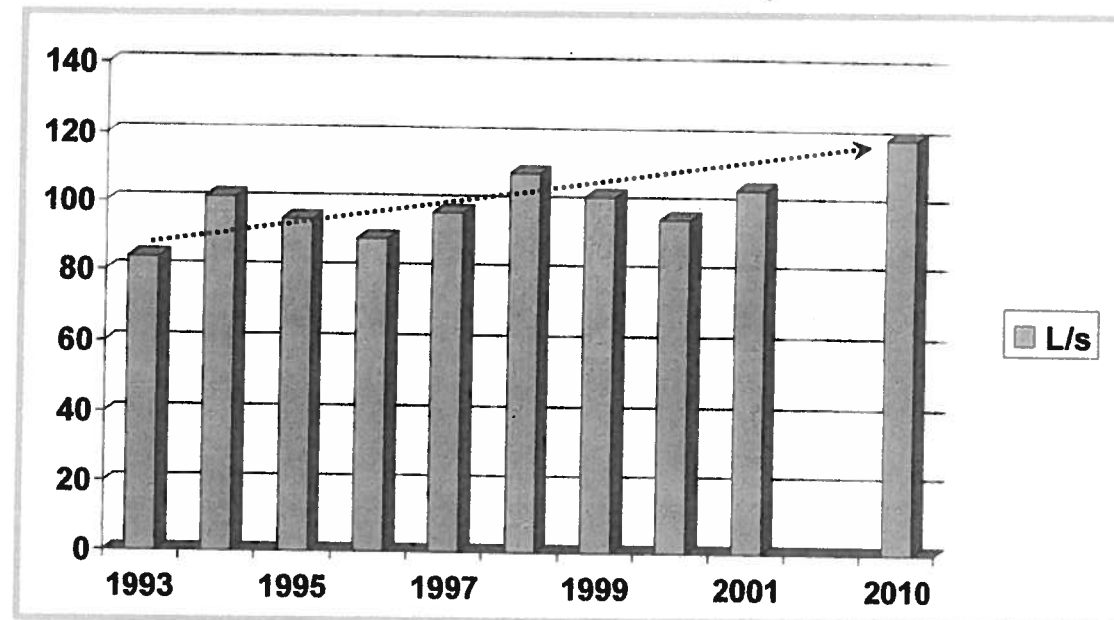


4.0 SUMMARY OF CURRENT SITUATION

4.1 Overview of Merritt's Water System

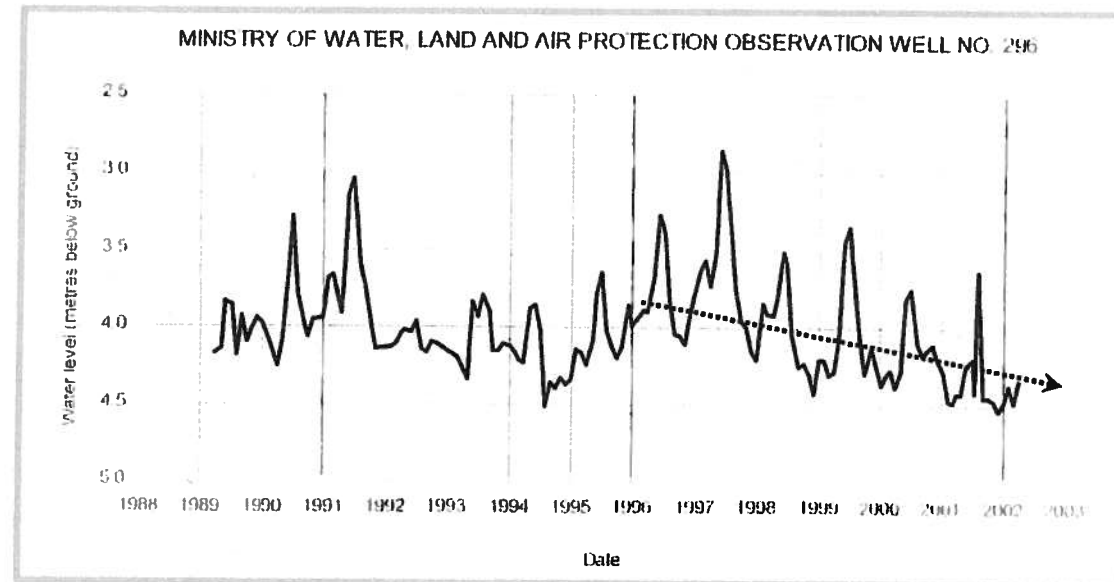
In Merritt water is currently supplied by four major wells (Voght Park #1 and #2, Collettville and Fairley Park). The average annual flow is approximately 100 litres per second with a maximum flow demand of 279 litres per second. Despite success in reducing the peak consumption rates, there is still an increasing trend in the pumping rate of the City's production wells, as shown in Figure 7 below.

Figure 7: City Production Wells – Pumping Rate Trends



Source: BC Groundwater, September 2004

Merritt's wells are all connected to the City's only source of water, a shallow, unconfined, aquifer. The new "deep" well being drilled - north of the former Kengard school - draws water from the deepest of several aquifers. There are several unknowns surrounding the various aquifers including the area covered by each aquifer, sustainable capacity, and interaction with other aquifers or surface waters, vulnerability etc. However the long term trend, based on data from the Ministry of Water, Land and Air Protection Observation Well No. 296 (which monitors the near surface aquifer that currently serves Merritt), is a decreasing water level in the aquifer as shown in Figure 8. The number and consumption rate of potential future water consumers is also unknown so reducing unnecessary use of this resource in the short run is very important.

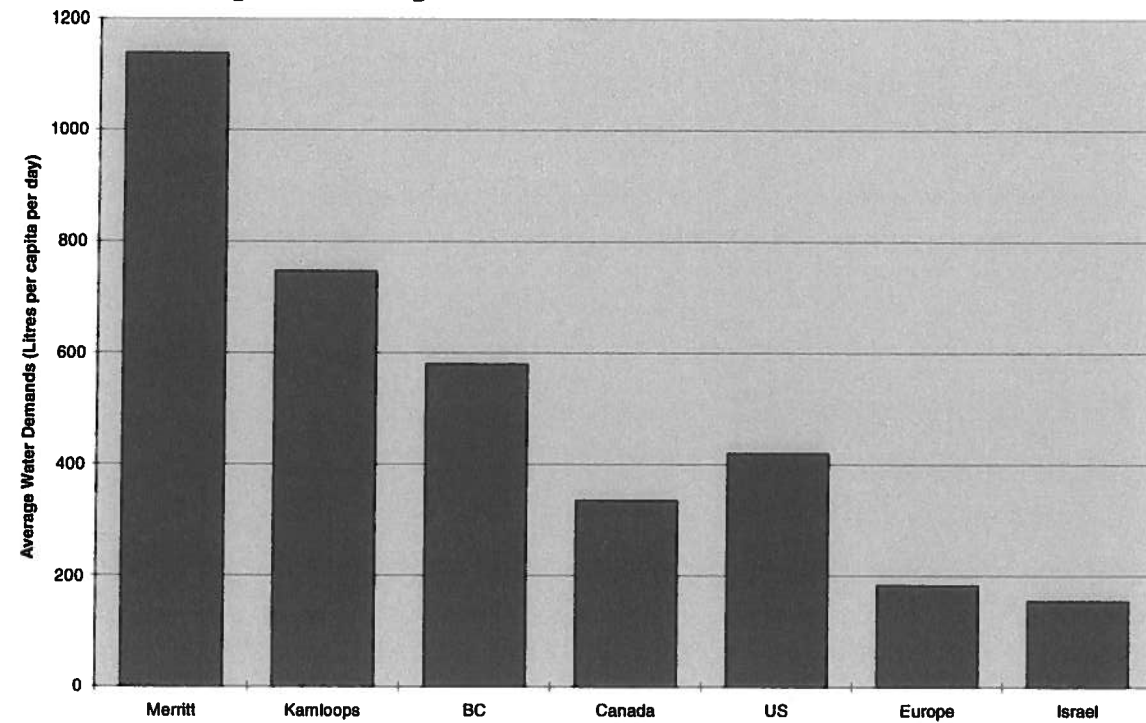
**Figure 8: City Production Wells – Groundwater Level Trends**

Note: the trends are most applicable to an "unconfined" Main Aquifer scenario.

Source: BC Groundwater, September 2004

Merritt residents have a higher daily rate of water consumption compared to other cities in the province, the provincial and national averages, and other countries in the world. This comparison is shown in Figure 9.

In general, water consumption varies significantly between houses, depending on the number of people living in each home and their water use habits. Water consumption will depend upon a number of considerations including: the amount of lawn and garden watering that occurs, the type of sprinklers and irrigation systems installed, the presence of pools and/or hot tubs and car washing frequency to name a few. Typical winter consumption might be: 400-800 litres/day (100-200 gal/day) for 1 or 2 occupants; 600-1000 litres/day (150-250 gal/day) for 3 or 4 occupants; and over 1000 litres/day (250 gal/day) for 5 or more occupants. The time of day and season will also affect consumption.

**Figure 9: Average Water Demands for Merritt and Elsewhere²**

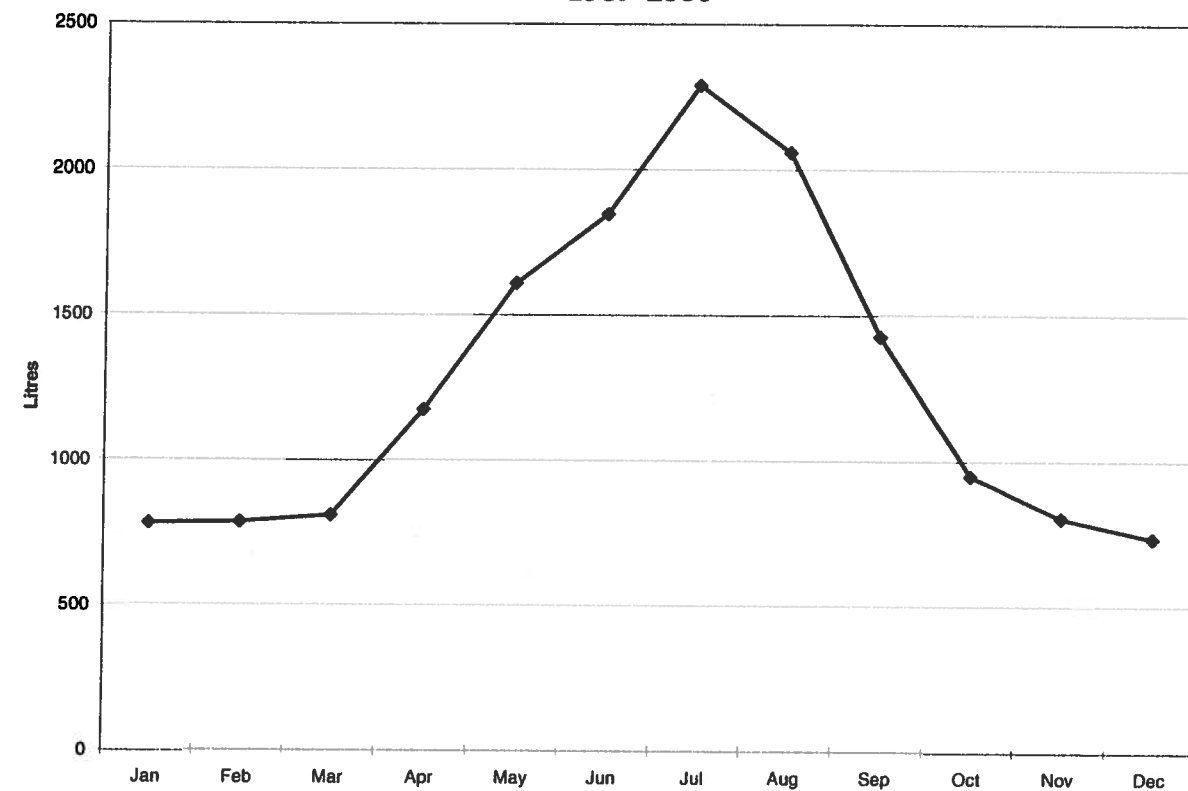
This annual pattern of water usage in Merritt, is shown in Figure 10 below. Peak water demands occur in the summer at an average rate of approximately 2300 litres/person/day³ (500 gal/day). Looking at data over the last 6 years (2002-2007), the absolute peak day occurred on August 9, 2005, with 3661 litres/person/day (800 gal/day) of water being consumed. This peak demand is in response to the semi-arid climate and hot, dry weather. The introduction of a water conservation program in Merritt has begun to some extent to address peak demands. In addition, a bylaw has been in effect since 1998 to mitigate the summer peak by restricting time of day that outdoor water use can occur, but the focus of water conservation efforts has been on education rather than enforcement. The City has experienced reasonable success since introducing the program, with a 23% reduction in summer peak demands between 1993 and 2006.

² This figure is based on a per capita estimate which includes all users (i.e. residential, industrial, institutional, etc.). As such, the per capita data may be skewed by large users.

³ From 1987-2006.



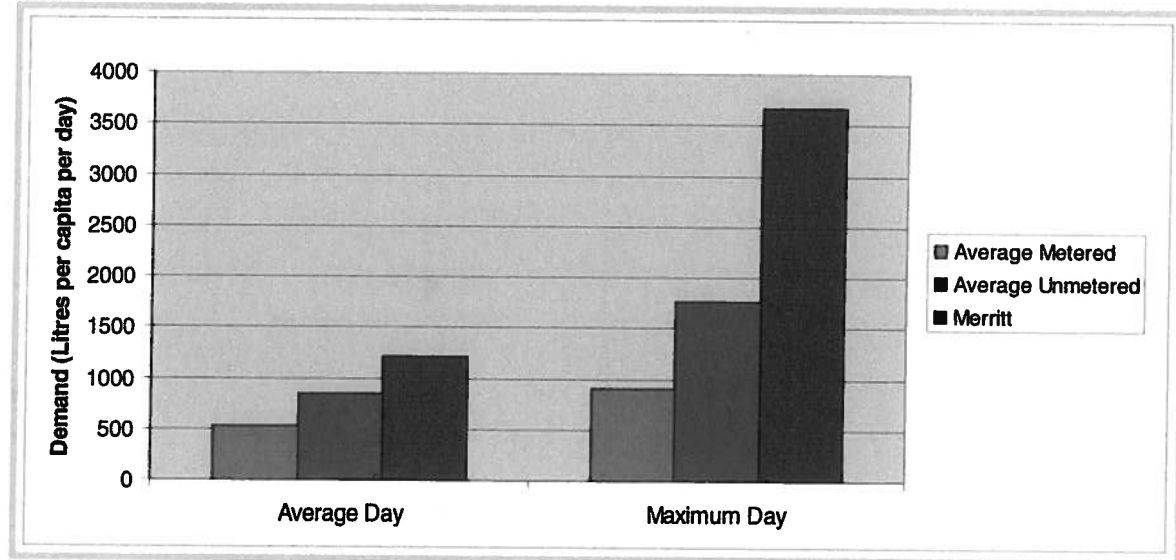
**Figure 10: City of Merritt – Average Daily Water Use by Month (Litres) Per Person
1987-2006**



Although Merritt has taken measures to reduce peak demands, overall demand in the City is still higher than most other municipalities. When consumption in the City of Merritt is compared to the average metered and unmetered demands for municipalities in Canada, the comparison identifies a significantly higher average daily consumption per capita in Merritt. Figure 11 below shows this variation.



Figure 11: Water Consumption Comparison Between Merritt and Other Canadian Municipalities (Metered and Non-Metered)



4.2 Water Metering in Merritt Today

Currently, the City of Merritt does not meter residential water consumption, although since 1999 all new residential units have been required to install water meters. It is estimated that there are currently 282 water meters installed throughout the community (including residential, commercial and institutional uses). Of these 282 water meters, 173 have been installed in private residences but are not read and are charged a flat rate. In contrast, the remaining 109 meters are installed in commercial, industrial and institutional uses and are charged based on use. Table 2 below, provides an overview of Merritt’s water system and metering to date.

Table 2 – Water Infrastructure Summary for Merritt

Population (2006) ⁴	6,998
Present Rate of Growth (2001-2006)	-1.3 %

⁴ ‘Total Number of Private Dwellings’ and ‘Population’ is from the 2006 Community Profiles; ‘Total Number of Commercial, Industrial, Institutional,’ is from the BC Assessment 2007 totals.

**Table 2 – Water Infrastructure Summary for Merritt *continued...***

Total Number of Private Dwellings (2006)⁴	2947
- Private Dwellings with Water Meters ⁵	173 ⁶
Total Number of Commercial Facilities⁴	381
- Commercial Facilities with Water Meters read by the City ⁷	87
Total Number of Industrial Facilities⁴	26
- Industrial Facilities with Water Meters read by the City ⁷	8
Total Number of Institutional Facilities⁴	26
- Institutional Facilities with Water Meters read by the City ⁷	14
Sewer System Pipe Main Length	56,000 m
Water System Pipe Main Length	67,000 m
Water Reservoirs	2
Fairley Park Well Rated Pumping Capacity	64.4 L/s
Voght Park Gas (#1) Rated Pumping Capacity	90.9 L/s
Voght Park Electric (#2) Pumping Capacity	140.2 L/s
Collettsville Well (planned design capacity)	51.4 L/s
Kenggaard Well (planned design capacity)	75 L/s
Average Pressure (in Low Areas)	760-830 kPa
Average Annual Flow	100 L/s
Average Daily Demand	1218 L/c/d
Average Maximum Month Demand	2348 L/c/d
Peak Day ⁸	3661 L/c/d

Note: The information in this table contains estimates in the absence of precise data being available.

⁵ Private dwellings include mobile homes and exclude secondary suites

⁶ Based on building permit data from 1999 to 2006 supplied by the City of Merritt

⁷ Based on numbers supplied by the City of Merritt

⁸ The Peak Day (between 2002 and 2007) occurred on August 9, 2005



5.0 COST-BENEFIT ANALYSIS

Water meters dramatically improve water efficiency over a short period of time, resulting in maximum savings when metering is combined with a rate structure that is based on use. The on-going implementation of a water meter program can provide the opportunity to move the City to the next level in water conservation and postpone capital cost spending related to expanding existing infrastructure in response increasing water demands and use. Expansions would include the addition of new facilities to meet peak demands, such as new wells, pumping stations, transmission lines, distribution lines, and reservoirs. A reduction in water usage and disposal will result in a reduction of operating and maintenance costs for both water systems and the wastewater treatment plant.

As identified in other municipalities, implementation of a water meter program can typically result in a 15-30% reduction in water consumption. Figure 12 below indicates what these reductions would mean in the context of the City of Merritt.

Figure 12: Potential Water Consumption in Merritt Based on Demand Reductions from Meters

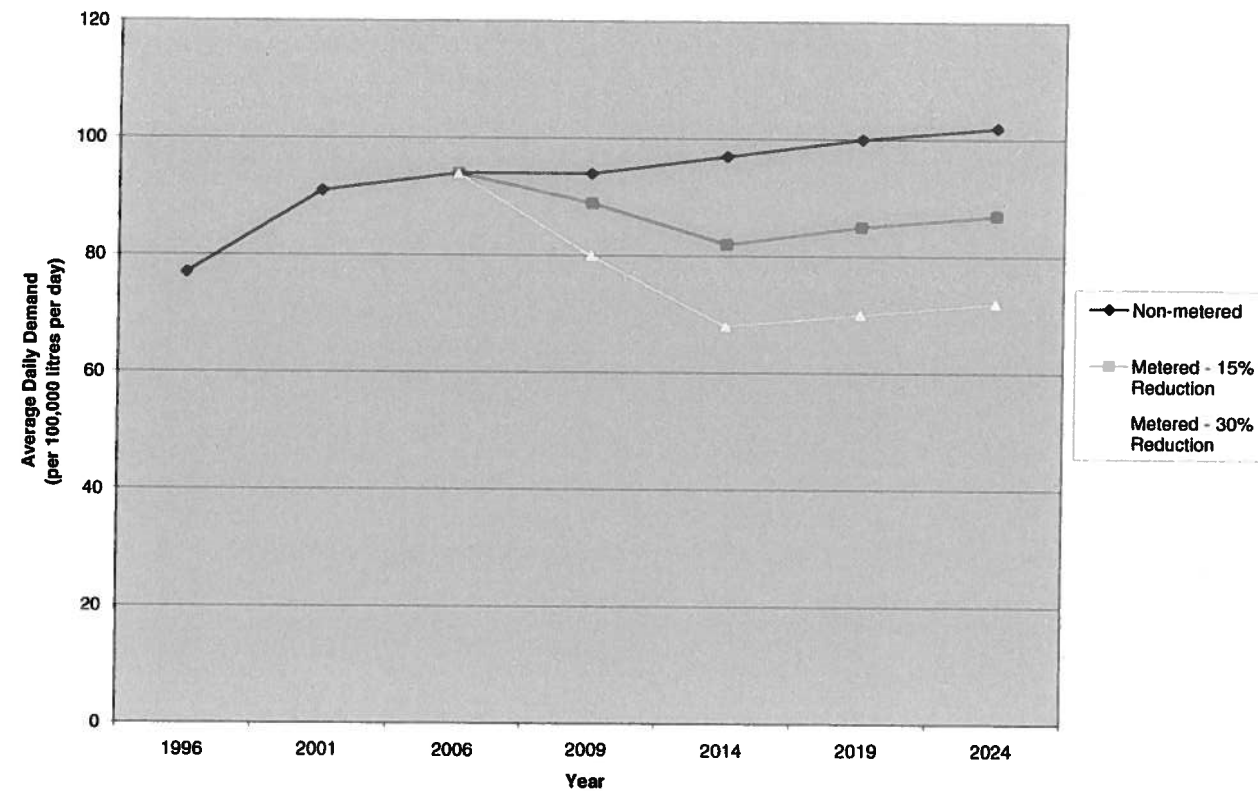
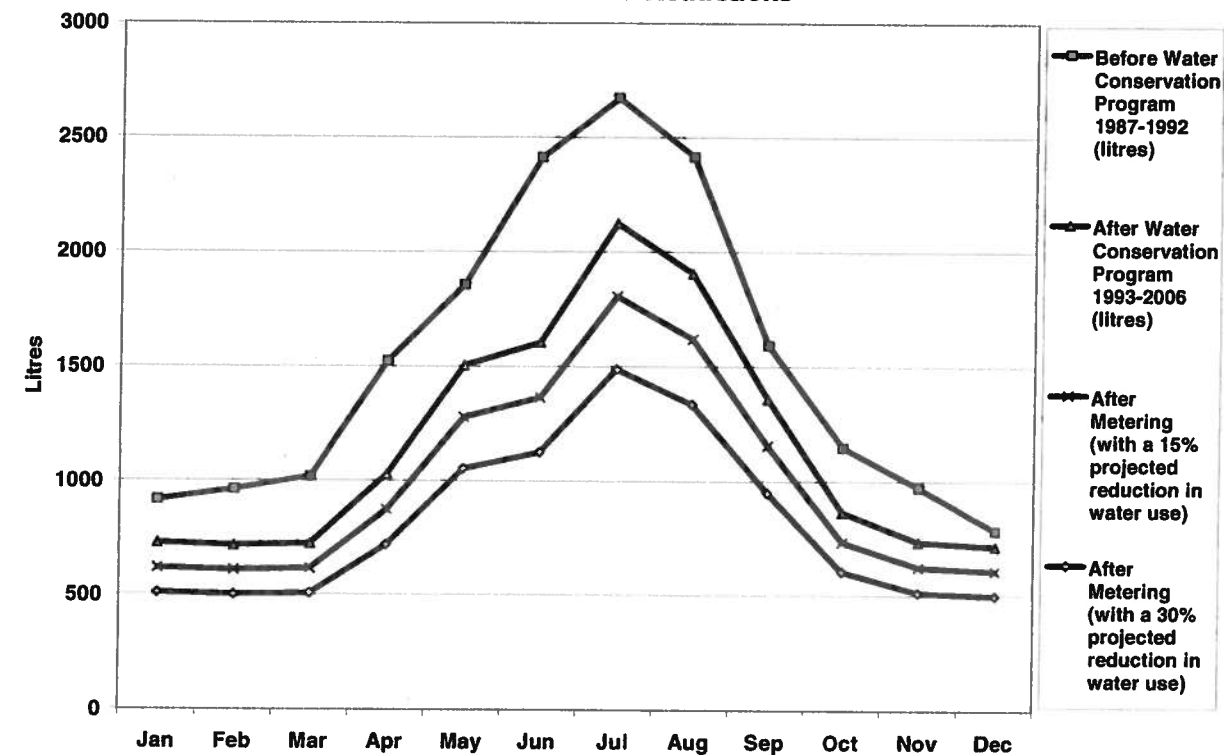




Figure 13 illustrates the impact of the City's water conservation efforts on average daily water use per person since 1987. The top line shows average use in the years 1987 to 2003 before a formal water conservation program was launched. Following the introduction of the water conservation program between 1993 and 2006, water use per capita decreased by approximately 23%. It is expected that additional reductions in water use, - between 15% and 30% - will be possible with the introduction of a universal metering program as shown by the bottom two lines.

Figure 13: Comparison of Average Daily Water (Litres) Use Per Person with Various Demand Reductions



5.1 Recent New Meter Installation

The City of Merritt currently requires all new services and all existing non-residential services to have a water meter installed. The installation of each meter is a condition for a building permit with the water meter being issued at the same time as the permit. Merritt currently uses Neptune meters with remote electric read outs. In single family dwellings, the size for these meters is 19mm (¾") and the cost, as set out in Bylaw No. 1640, is \$200. If the Building Inspector determines that another size is required then the meter will be special ordered and the owner charged at cost. Meter sizes for commercial and large residential buildings are determined



by the project engineer. Once meters have been purchased, it is the owner's responsibility to install them. To date the City does not read residential meters.

The estimated costs to install water meters throughout existing development in the City of Merritt are shown in Table 3. It should be noted that the cost and level of effort required for industrial meters differ on a case-by-case basis. As such, estimates provided in Table 3 are based on very general assumptions and are discussed further in Section 5.3. Capital costs associated with water meter installation are estimated to be in the order of \$ 2.4 million.



Table 3: Cost Estimate for Water Meter Installation in the City of Merritt

	Water Meters					
	Residential (19mm meters)			Commercial		
	Purchase and Install	Retrofit	Purchase and Install	Retrofit	Purchase and Install	Retrofit
Price	\$400	\$260	\$500	\$260	\$25,000	\$5,000
Number Required	2775	175	300	90	20	10
Cost	\$1.1 Million	\$46,000	\$150,000	\$23,000	\$550,000 (allowance)	
Total**	\$2.4 Million					

*Significant work can be required for installing industrial meters.

** a 25% contingency has been included

5.2 Water and Waste Water Expenditures

The increased costs to purvey water within the City will inevitably affect municipal water rates. The average expenditures incurred by the City of Merritt from 2003 to 2006 for water and waste water services are significantly higher than between 1997 to 2002, as shown in Table 4 below. While some of these cost increases are related to planned upgrades of water treatment plant, which are now nearing completion as part of the Liquid Waste Management Plan, the cost of water in Merritt will continue to increase as higher level water and waste water treatment is required by agencies such as the Interior Health Authority and Ministry of Environment. In addition, groundwater regulations continue to evolve, and there are still many unknowns surrounding the aquifer from which Merritt currently extracts all of its water. The implications of these regulations are not clear at this time, but are likely to potentially increase overall water costs for the City. Water rates (or costs to purvey water) could also rise if the City is forced to move to deeper wells for all of its water in response to a decrease in shallow the water table, declining quality in the near surface aquifer, or for other reasons.

Table 4: Water and Wastewater System Expenditures

System	Annual Expenditures					
	1997 to 2002 ⁹	2003	2004	2005	2006	2007
Water System	\$278,080	\$761,184	\$817,058	\$826,285	\$759,496	\$1,220,849
Wastewater System	\$485,152	\$1,003,438	\$1,061,753	\$1,148,709	\$1,008,017	\$1,398,342
Total	\$763,232	\$1,764,622	\$1,878,811	\$1,974,994	\$1,767,513	\$2,619,191
Average cost per capita*	\$103.66	\$240.81	\$254.51	\$267.54	\$239.79	\$351.24

Note: Expenditures for both water and wastewater systems include an annual transfer to capital, transfer to reserves, and fiscal component

*Based on BC Stats estimated populations of 7,363 for 1997-2002; 7,328 for 2003; 7,382 for 2004; 7,382 for 2005; 7,371 for 2006; and 7,457 for 2007

Based on the projected savings in Kamloops and applying these to Merritt, the City of Merritt may expect savings of between approximately \$100,000 and \$200,000 for water system operations

⁹ Average over 1997 to 2002

and for wastewater systems.¹⁰ Merritt currently does not have to account for water treatment costs, but wastewater systems costs are significant when compared to other municipalities because the process is more mechanical. Other costs related to water include the deep well under construction and reservoir capacity. The wastewater system expansion is under construction, however, future expansions could be deferred if consumption rates are further decreased, resulting in reduced costs for solids handling. Potential savings with the introduction of water metering in Merritt is shown in Table 5 below.

Table 5: Example of Potential Water Savings as a Result of Meters in Merritt

System	Annual Expenditures		
	Without Meters*	With Meters**	Savings Due to Meters
Water System	\$ 1.2 Million	\$ 1.0 – 1.1 Million	\$ 100,000 – 200,000 15-20%
Wastewater System	\$ 1.4 Million	\$ 1.2 – 1.3 Million	\$ 100,000 – 200,000 7-12%

* based on Merritt's 2007 annual expenditures

** calculated using a range of savings centering around the City of Kamloops estimates (15-20% for Water System Operation and 7-12% for Sewer Treatment) and based on actual water costs for Merritt without meters. These calculations do not include the cost of purchasing and installing water meters. Those costs are described later in the report.

5.3 Rate Structure Considerations

A volume-based metering system provides an incentive for consumers to control their water use. However, the meter is simply the mechanism through which rate structures are implemented. As such, the rate structure is potentially the most important consideration in developing a water meter program to ensure Council's goals in implementing the program are achieved. The rates of these water services should be reasonably priced and equitable, ensure that sufficient revenues are recovered to pay the full capital and operating costs of providing this water, and take into consideration the cost of existing infrastructure depreciation.

There will be some challenges to consider in implementing a rate structure that is fair and equitable given there are numerous uses (i.e. commercial, institutional, industrial) that vary in how they not only use water, but also in how the buildings and facilities are constructed. For example, commercial buildings vary in size and configuration. Sometimes multiple businesses will share the same building, so it will be important to consider how those businesses will be charged for water use – will it be on an individual basis or on the entire building as a whole? Malls introduce another example where water meters could be installed for individual businesses;

¹⁰ Based on very cursory projections.

ably occurs and the configuration and layout of the building will

ly in size and intensity of water use. It takes greater capital an industrial facility when compared to other users, so a capacity meter, should be considered as part of the rate structure. This in terms of costs to install water meters and the corresponding located. These costs could range from \$5,000 to as high as initial strata-type developments raise challenges as they require conservation effectiveness. However, there are increased costs ing reading and billing. While there is no easy solution to these ered in the overall planning for water meter implementation and



6.0 PUBLIC CONSULTATION

The City has been very proactive in recent years in promoting water conservation awareness in a variety of ways throughout the community including the hiring of summer students to engage the public, publishing public information notices/pamphlets through local media as well as outdoor watering restrictions during the summer months. Given these efforts, residents of Merritt should be well - informed about the importance of water conservation and the unique challenges and costs facing Merritt with regards to providing water on an on-going basis.

When introducing a universal water metering program, transparency will be critical to ensure the public understands why and how Council is making decisions and enable the public to ask questions openly. As such, a public open house was held on March 12, 2008 to provide an overview of information on water metering and engage the public early in the process. The purpose was to receive feedback from residents, businesses, and property owners regarding the introduction of water meters in the community in order to gain a better understanding of public views and concerns, and to help shape the way the public is engaged throughout the program. The display panels used at the open house are provided in Appendix A.

There were 42 people who attended the open house, consisting of mostly residential property owners with at least one industrial business owner/operator present. Attendees were asked to fill out a survey and 31 surveys were returned. The survey data is provided in its raw form in Appendix B.

Common themes that were identified in conversations during the open house and identified in the surveys include:

- **Responsible water use** – ensuring everyone uses water responsibly, including large water users such as the School District, Hospital, City of Merritt, industrial operators, out of town users who hook up to hydrants, and extensions to new developments.
- **Public involvement and accountability** - a repeated concern was that if water meters become a requirement for residents and businesses, the water use of public facilities, including parks and schools, should also be monitored along with hydrants used to fill water trucks, construction sites, and industrial users. Surveys indicated a desire to require everyone to use meters, without exception.
- **Equity** – ensuring individuals pay for what they use so that abusers will not be subsidized by the rest of the community.
- **Information availability** – attendees appreciate that water use can be better tracked and large water users identified through meter reading.



- **Cost of water meter installation** – who pays for the installation and what are the costs. Installation was especially a concern for residents with finished basements who do not have direct access to their pipes which may require expensive retrofits to accommodate meters.
- **Costs to consumers** – respondents want to see incentives built into the rate structure to reward those who reduce water consumption and penalize those who use excessive amounts.
- **Water meter technology** – most attendees were interested in what a water meter looks like, how it is read, and where it would be installed. The water meter on display was helpful in providing this information.
- **Concern over Council's level commitment** – several attendees expressed their desire to see Council carry through on water meter installation.
- **Underground sprinklers** – several residents in attendance reported having in-ground sprinkler systems which are connected between the house and the street. As such, some residences will require meters to be installed outside of their home, or that the sprinkler connection be changed, which will affect the cost and installation process.

Given the common themes identified above, there are a number of recommendations that should be considered in developing the next phase of the program. These include:

- providing a rates structure early for public review;
- identifying the costs related to installation and clearly defining who will be responsible for paying for which parts;
- ensuring the program is truly universal and includes all water users;
- ensuring abusers will not be subsidized by the rest of the community;
- ensuring that the City and other large water users are taking responsibility for water use in public facilities;
- addressing concerns regarding out of town users and extensions to new developments.



7.0 NEXT STEPS

Suggested next steps in the universal water meter implementation program are outlined below and include recommendations with respect to engaging the public as well as undertaking Phase 2 of the program which involves determining a course of action and inviting private sector involvement as appropriate for the selected approach. These outcomes will be considered by Council and staff prior to finalizing the approach.

7.1 Public Consultation

It will be important to continue to engage the public throughout the City's decision making process with respect to water metering including clarity on the program, how the program will be introduced, billing and rate information, scheduling, etc. Consistent and accurate messaging must be maintained throughout the program so that the public is well-informed at all stages. Effective public consultation also means providing a well-articulated cost recovery approach to help dispel fears the public may have. Lack of public information will inevitably result in skepticism, even resistance, and potentially quash successful implementation of water meters.

7.2 Water Meter Implementation Plan – Phase 2

In phase 2, a second report will be prepared to outline, in more detail, the various approaches the City may want to consider with respect to determining types of meters, installation, data capture, billing, maintenance, customer service, etc. based on the direction of this Phase 1 report and public consultation session. This report will outline the different technologies and installation methods available and recommend an approach for the City. This approach will be based on a number of options ranging from the private sector undertaking all aspects for the program, or the City undertaking the majority of the program. Once Council and staff have reviewed the report, we will host a mini-workshop to review the options and the associated advantages and disadvantages of each approach and determine a preferred course of action.

Following this, if appropriate, a Request for Expressions of Interest (EOI) will be produced to invite the private sector to provide information on potential approaches. These submissions will be weighed against the advantages and disadvantages as outlined above to determine a preferred method of implementation and consider which manufacture(s) may be interested and/or most competitive. This information can, if appropriate, provide the basis for the structure and technical criteria for a Request for Proposals (RFP).

Throughout the process, it will be critical for Council and the City to maintain a hands-on approach in establishing the program to ensure success in achieving higher levels of water



conservation. While the program may range from the City undertaking all elements of water meter implementation to an entirely private sector initiative, the City's success in achieving a range of savings of 15 to 30% will depend on the level of City involvement and commitment to the process.

7.3 Rate Structure Study

Water meters are only one part of the water conservation implementation strategy. Metering, without an appropriate pricing mechanism, is unlikely to be financially sound, publicly acceptable or achieve desired conservation goals. By undertaking a rate structure study, the City can resolve an approach to cost recovery that more adequately reflects the cost of providing the service. A well-thought out rate structure will be critical to the process. As mentioned earlier, public fear of the unknown could be the demise of the program; as such, the proposed rate structure should be communicated to the public as early as possible in the program. The key goals regarding the rate structure can be established early, with more details being determined closer to the meter installations.



8.0 CONCLUSION

Water conservation as a result of installing water meters will allow the City of Merritt to sustain a high quality of life through more informed decisions regarding water consumption. It will also provide the opportunity to:

- create equitable rates for customers;
- reduce water use wastage;
- promote water efficiency;
- measure and assist in reducing high flow peaks;
- minimize environmental impacts;
- reduce loads on wastewater facilities;
- measure use of water resource;
- reduce capital funding needs for water and sewer system expansions;
- delays capital upgrades;
- ensure financially sustainable revenue; and
- ensure future capital costs for the system are apportioned equitably to users

Merritt has seen some success with the current efforts surrounding water conservation, but a universal water metering program will take these efforts to new heights. In addition to achieving additional water conservation goals, Merritt will also see financial savings in the long run. This will also enable Merritt to be well-positioned to take advantage of future water and perhaps sewer grants as government funding will soon be dependant upon municipalities demonstrating efficient water use strategies and implementation programs.



APPENDIX A

**Open House Panels
March 12, 2008**

Considering Water Meters in the City of Merritt

WELCOME

PUBLIC OPEN HOUSE

March 12, 2008

4:00 pm – 7:00 pm

CITY OF MERRITT

**CONSIDERING WATER
METERS**



PURPOSE OF THE OPEN HOUSE

Council is in the early stages of considering the feasibility of water metering in Merritt.

We are looking for feedback from you regarding the introduction of water meters in the community.

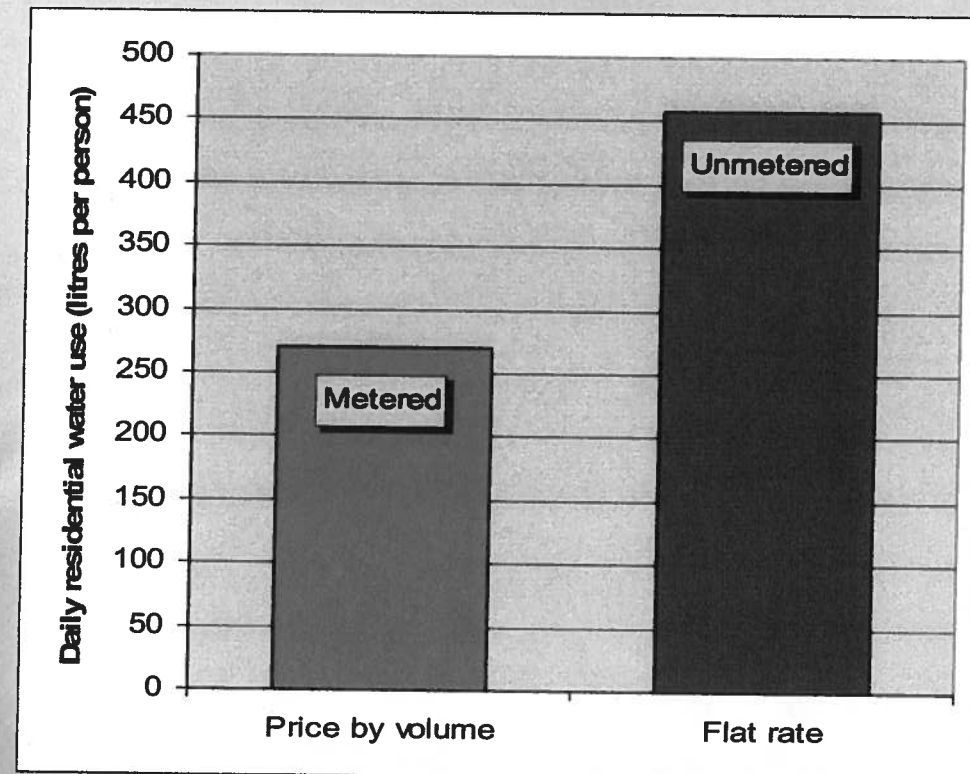
No decisions have been made regarding the implementation of water meters, so your input will be very useful in assisting Council in their decision-making process.

Please take some time to look at the panels and fill out a survey before you leave.

If you have any questions or concerns, please feel free to ask.

BENEFITS OF WATER METERING

Metered versus Unmetered Daily Water Use – Canadian Average



When water meters are introduced, there is a significant reduction in overall water use – this can range between 15% and 30%.

The table above illustrates how, based on a study of 1266 municipalities in Canada, metered customers have seen a decrease in water use when water meters are installed and an equitable rate structure is utilized.

WHY ARE WATER METERS BEING CONSIDERED IN MERRITT?

- **Further reduce water use and encourage water conservation.**
- **Provide water in a more equitable way so that users pay for what they actually use – not a bulk rate.**
- **Invest in the future by responding proactively to changing regulations and increased costs to provide water (i.e. increasing electrical rates, future water treatment requirements, upgrades and extensions to water and wastewater facilities, etc.).**
- **Reduce costs to pump and store water.**
- **Reduce flows and costs to treat waste water at the sewage treatment plant.**
- **Demonstrate environmental, social and economic sustainability.**
- **Preserve the City's primary source of water: our aquifer.**
- **Maximize use of the current water system and defer costly upgrades.**
- **Position the City for future infrastructure grants for water and sewer upgrades and save taxpayer money for infrastructure improvements.**

GUIDING PRINCIPLES

The following guiding principles provide direction for the implementation of a customized universal water meter program in Merritt over the coming years.

EDUCATION – will be critical at all levels to the success of the program; this includes ensuring Council and staff have the tools necessary to make decisions and that the public is fully informed and meaningfully engaged throughout the process.

ACCOUNTABILITY/TRANSPARENCY – ensure information and decision making is open and well-communicated.

SYSTEM MANAGEMENT – ensure management of the water system is efficient, cost effective and provides useful information required to ensure responsible stewardship of the City's infrastructure (including operations and maintenance) and sustainability of the aquifer.

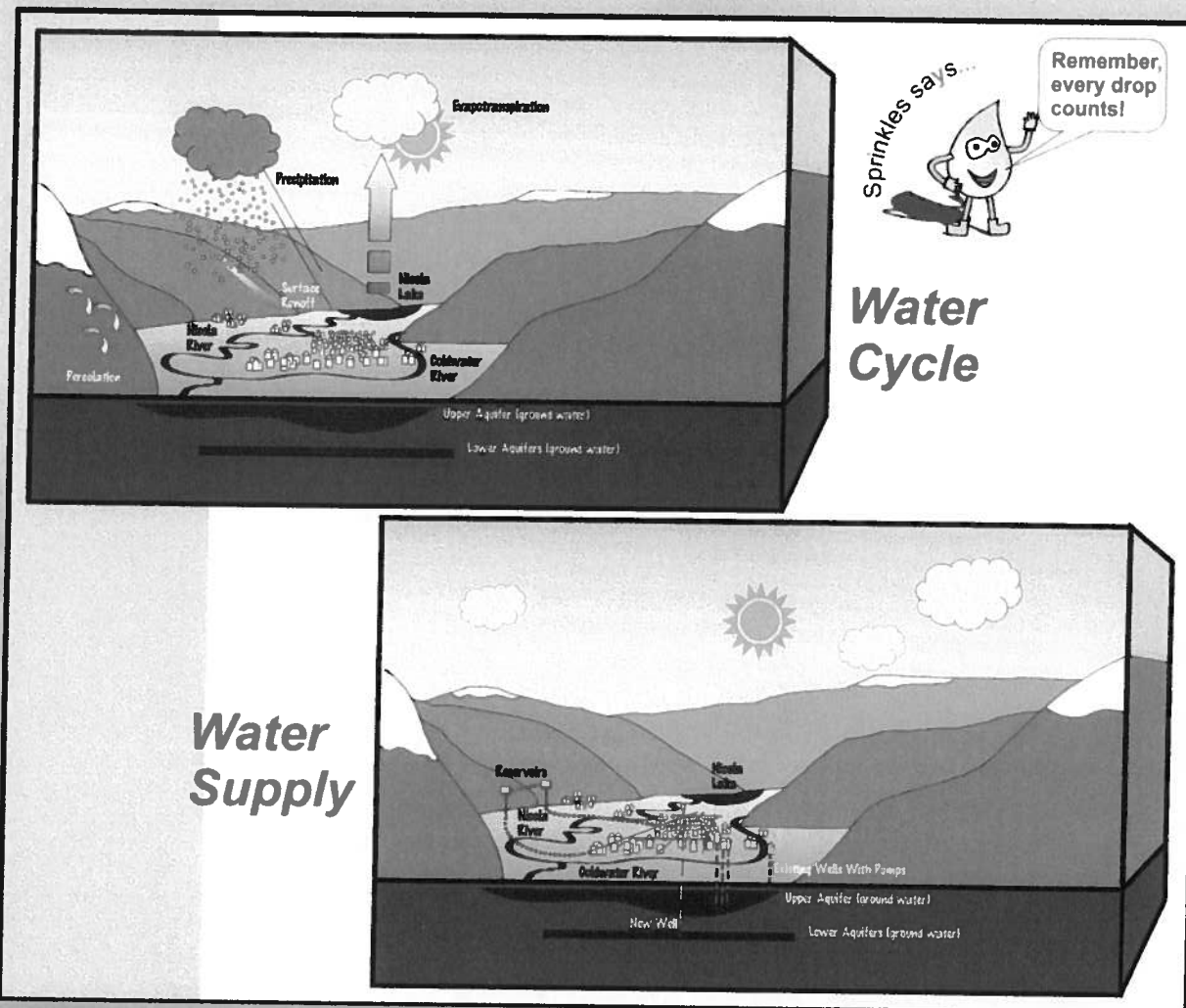
PUBLIC PARTICIPATION AND CONSULTATION – encourage public consultation that is meaningful and effectively provides opportunities for feedback from all stakeholders.

FINANCIAL STABILITY – ensure cost recovery is fair and equitable while also ensuring financial sustainability of the City's assets, maintenance and operations.

ENVIRONMENTAL STEWARDSHIP – continue to support and promote the benefits of water conservation for the community.

LEAD BY EXAMPLE – ensure the City is demonstrating commitments to water conservation and metering through the actions of the municipality in terms of water use for facilities and parks as well as making efforts to detect and minimize water losses through inefficiencies and leaks in the system.

OVERVIEW OF MERRITT'S WATER SYSTEM



Water Cycle – this illustrates the natural cycle of water within the Nicola Valley

Water Supply – provides an overview of Merritt's water infrastructure

OVERVIEW OF MERRITT'S WATER INFRASTRUCTURE

- **Water is supplied by 4 major wells (2 in Voght Park, 1 in Fairley Park and 1 in Collettville)**
- **Wells are connected to a shallow, unconfined aquifer which is the City's only source of water.**
- **A new well is currently under construction to access a deeper aquifer.**
- **The system relies on electricity to run the pumps for each well; electricity costs the City \$100,000 annually.**
- **The City has a storage capacity of 4.9 million litres (1.1 million gallons) in two reservoirs located at Grimmer and Nicola. Without water supply from the well, these reservoirs could only supply the City for ½ a day given current water use on a peak day.**

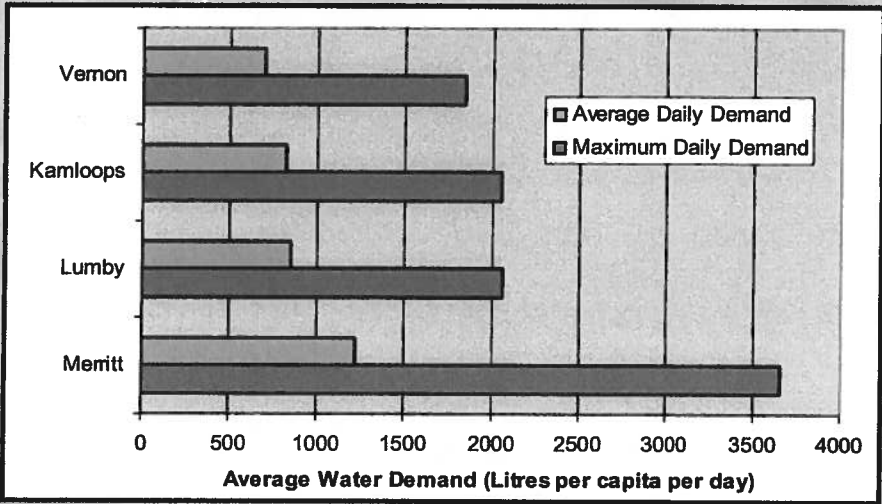
FACTS ABOUT MERRITT'S WATER SYSTEM

- **Merritt's water system has unique characteristics:**
 - **Water supplied to the entire City system comes from one source: the aquifer. There are many questions regarding the sustainability of this aquifer.**
 - **Much of the water system is subject to water pressures that are much higher than most municipalities due to the configuration of the water system.**
 - **This means a leaky toilet in Merritt will waste far more water than a leaky toilet in most other communities. All that extra water is also treated at the waste water treatment plant.**
- **Merritt's water rate for residents is based on a flat rate system.**
- **Some industrial/commercial users have meters and pay based on use.**
- **All other users pay on a flat rate basis.**

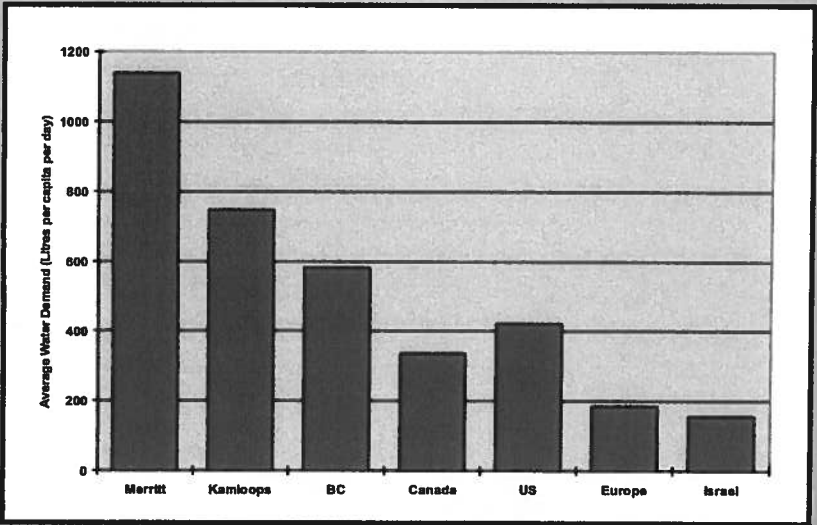
OVERVIEW OF MERRITT'S WATER USE

Merritt residents have a higher daily rate of water consumption compared to Interior communities, the provincial and national averages, and other countries in the world.

Comparison of Water Demands in Interior BC Communities Without / Before Water Metering



Average Daily Water Demand in Merritt Compared to Other Places

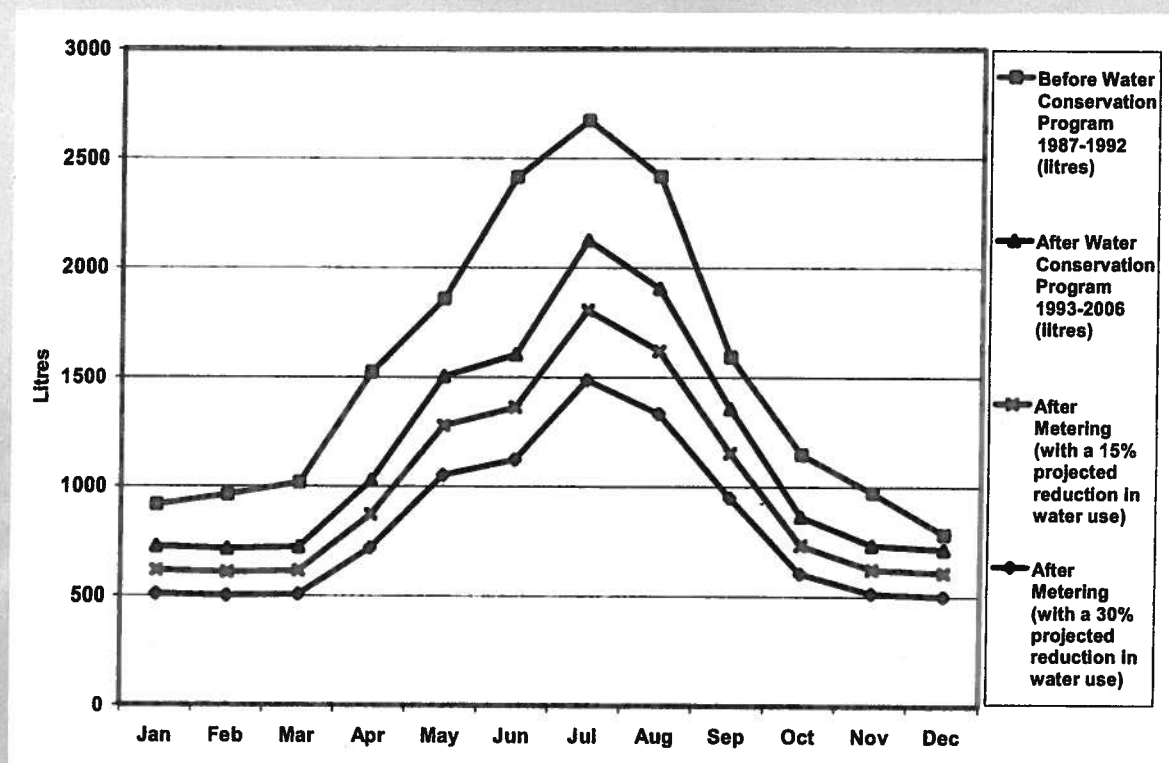


BRIEF HISTORY OF WATER CONSERVATION IN MERRITT

- **The focus of water conservation in Merritt has focused on public education and awareness since 1993.**
- **Enforcement of sprinkling regulations have been introduced and have had a modest yet positive effect on decreasing summer water use.**
- **In 1998, a Bylaw requiring installation for meters and low flow fixtures for new construction was adopted.**
- **In 2003, the City undertook a Water Conservation Strategy to look at ways to further reduce overall water use.**
- **The City of Merritt has undertaken efforts to reduce water for municipal facilities such as upgrades to park irrigation systems.**



WATER CONSERVATION TO DATE & ANTICIPATED REDUCTIONS WITH METERS



Before Merritt first introduced the water conservation awareness program in 1993, average daily demand was very high (see pink line).

After the program was in place for a few years, Merritt saw average daily water use decrease by 23% (see green line). However, the community has reached a plateau in recent years, and there is a need to further reduce water use.

With water metering, it is expected that average daily use can be reduced by 15% to 30% (see brown and blue lines).

COST BENEFIT ANALYSIS

System	Annual Expenditures			
	Without Meters	With Meters	Savings Due to Meters	% Savings
Water System	\$1.5 M	\$1.2 - \$1.3 M	\$200,000 – \$300,000	15% - 20%
Wastewater System	\$1.5 M	\$1.3 - \$1.4 M	\$100,000 – \$200,000	7% - 12%

Estimated Cost for Water Meter Installation: \$2 Million

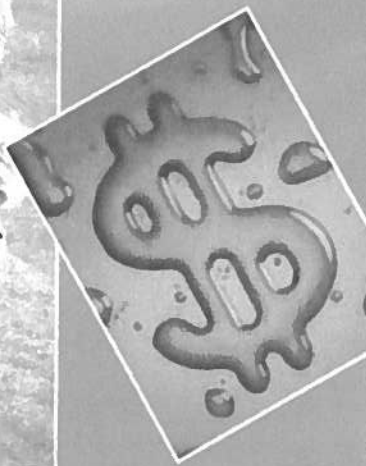
Based on experience in other communities similar to Merritt (in terms of climate, built form and population), it is expected that Merritt would see a 15% to 30% reduction in overall water use.

For the water system, this translates into savings of 15% - 20% in annual expenditures.

For the wastewater system, this translates into savings of 7% to 12% in annual expenditures.

HOW WILL COSTS AFFECT RATE PAYERS?

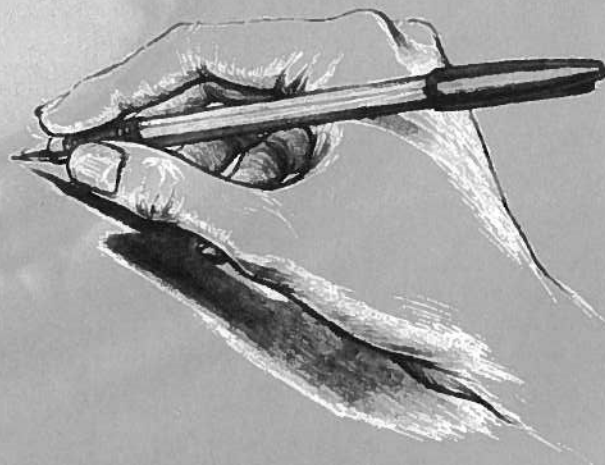
- **Council is committed to ensuring:**
 - **Affordability – rates are reasonable while adequately covering costs.**
 - **Equity and fairness – pay for what you actually use.**
- **A rate structure has not been determined yet because Council is considering all options and wants public input before making decisions.**



THANK YOU FOR COMING!

If you have any questions or concerns, please feel free to ask.

Please take 5 minutes to fill out survey to provide feedback and your thoughts on water meters in Merritt.



This will help Council in making decisions about implementing water meters in Merritt.



APPENDIX B

Survey Data
March 12, 2008 Open House

City of Merritt- Universal Water Meter Implementation – Phase 1

Compilation of Survey Results – March 12, 2008

Questions 1 to 6

Question 1		Question 2		Question 3		Question 4		Question 5		Question 6					
Check the following responses as they apply to you:		Do you own or rent your residential property?		How many people live in your household?		How large is your residential property?		Do you currently have a water meter installed in your home?		If you own or operate a business in Merritt					
										a) What type of business is it?		b) How large is your commercial or industrial property?		c) Do you currently have a water meter install in your business?	
	# ¹		# ¹		# ¹		# ¹		# ¹		# ¹		# ¹		# ¹
Residents of Merritt	31	Own	32	One	19	0.11 acres (465 m ²)	1	Yes	9	Commercial	0	80 acres (323749 m ²)	1	Yes	1
Residents outside of Merritt	1	Rent	0	Two	11	0.13 acres (543 m ²)	1	No	23	Industrial	1			No	2
Business Owner/Operator in Merritt	1			Three	1	0.14 acres (557 m ²)	4	I don't know	0	Home-based	1			I don't know	0
Commercial property owner in Merritt	0			Four	1	0.16 (650 m ²)	1			Other (Landscape Contractor)	1				
Industrial property owner in Merritt	0			Five	0	0.23 acres (940 m ²)	1								
Other	2			Six or more	0	0.25 acres (1012 m ²)	4								
• Vegetable Gardener															
• Own Property in Merrit as well															
						0.30 acres (1214 m ²)	2								
						0.303 acres (1226 m ²)	1								
						0.33 acres (1335 m ²)	1								
						0.37 acres (1497 m ²)	2								
						0.50 acres (2023 m ²)	1								
						0.18 acres (715 m ²)	4								
						0.55 acres (2226 m ²)	1								
						0.75 acres (3035m ²)	3								
						10 acres (40469m ²)	1								
						I don't know	3								

¹ Total number of responses for each option listed

The tables below are a compilation of the comments for Questions 7 to 10 of the 32 surveys completed.

Question 7 - What do you see as benefits of water meters?

• will confirm actual usage by household • encourage more responsible water use • force people to become aware of their own use (residential and business and public) • we've seen neighbours wash their vehicles and/or their driveways every day or two - unnecessarily wasting water, so meters would hopefully curb such practices	• the cheaters will pay for use • it makes people more aware of the amount of water they use • people pay only for the amount of water they use: you use less, you pay less.
• definite asset to help preserve the unnecessary usage from happening	• none. Just makes Urban Systems richer
• none. Police, fine, shut-off to the abusers. i.e. Underground sprinklers running every night 11 - 7 am & watering every day all day	• makes people realize that water is a precious commodity
• control water usage that is being abused • I moved from the prairies & know all about saving water • using the dish water & bath water for the flowers, shrubs, and lawn • rain barrels on each corner of house	• less water usage, especially if water chlorinated
• will measure the individual use - it is reported in the Merritt 2006/2007/2008 watering regulations "water use is 1100 litres per person". Impossible - try looking at the parks & golf courses - <u>That's</u> where the usage is!! • schools & the City of Merritt	• possible reduction in water use by residents not so sure about schools, City, golf course, etc. • should yield valuable information about which (who) are excessive users & therefore targets for education
• water conservation • will allow us to visually see the amount of water we use	• I really have no idea. I realize a lot of water is wasted around town but a lot is City and School board.
• the City of Merritt will recover cost over run of new well	• none
• users will pay for water use • way to monitor waste water and save on capital expenditure in future years	•using less water
• responsible use of precious water, especially on city property, parks and gold courses	• this is a good way to find out if we are loosing water or is our system leaking
• water conservation	• will see what amount of water is being used
• conservation	• to conserve water, if everyone has to abide
• have the heavy users pay more	• <u>everyone</u> pays for the actual amount they use
• control of water use • control of users if everything is metered (including parks, etc.)	• should hopefully cut down on moonlight water consumption and other unnecessary use of water
• pay for actual consumption • more control for sprinklers in yards • City can assess fair & equable fees	

Question 8 – What are your concerns regarding water meters?

• cost of meter & cost of installation • when you are a new resident building a home versus existing households	• my only concern is that it's taking this long to implement it should be done ASAP
• great just make sure the city and school board are enforced to use one and quit wasting in the parks out onto the streets	• becoming a tax grab. Residents in Vernon advised that is what it has become there • cost to install meters • the appeal/look of the City when all brown to tourists & residents
• the law abiding citizens of Merritt are being penalized for the abuse of water use by a few	• who will pay for installing & supply of meters
• not knowing the cost per gallon or litre • our residential property has 105 cedars surrounding the yard. We purchased it this way 18 years ago. My concern is having to remove the natural fence and wind break	• I like them, but no exemptions! • promote the use xeriscape landscaping • encourage use of gray water for outside • encourage use of low flush • lobby for regulations on well digging
• every water user - City/School/Business should be required to connect through a meter, not just homeowners	• council will exempt users when suits them
• cost • monitoring	• everything to be metered. Parks, school grounds, sani-dump, no exceptions. Fire hydrants as well
• rate structure will be to high	• extra cost
• I have already paid for my meter • I do not want to pay for someone else • pay for your own installation	• farmers - will everybody - will all water users be metered? • is it just a way to increase City revenue • what are the costs to retrofit meters - who pays?
• how do we educate people that water is becoming a scarce resource	• the size of the meter - my water comes into the house in my rec room (finished well) • also price of meter plus cost per month
• it will be hard on large, low income families	• no concerns
• cost per home • installation cost	• none, unless we will have to pay for what we normally use
• that it is a money grab & the households that use under average amounts will still pay as much as those households using above average amounts of water	• do we really need them? • if we need to conserve our water so badly, should we be supplying water to developments outside our city boundaries
• cost of install	• reading meters & billing cost
• cost of installation – also destruction of finished inside area and cost to refinish or replace walls – tiles etc. – possibility of cement replacement	• water meters would be penalizing vegetable growers – a necessity of life. Even the city of Vancouver, when they have water restrictions, exempt flowers and vegetables from the restrictions! To properly grow vegetables, an adequate amount of water is needed. While Mayor Laird says hand watering is permitted, he does not understand the need to "deep" watering for proper growth. Shallow watering by a hand sprinkler only soaks in an eighth of an inch, and actually causes the roots to turn upwards to seek moisture hence exposing the

	fragile roots to the hotter surface of the soil.
• City should do whole town in one	

Question 9 – How could your concerns about water meters be best addressed?

• serious application by the city, school district, golf courses, etc. in water conservation • ie. Install artificial lawn - no watering, no mowers, no pollution & reduce manpower	• if I have to pay for the water, I want to decide when and how I water. I now have to broadcast, which wastes huge amounts of water through evaporation. I would like to go back to underground soaking hoses, which use very little water and have zero waste. No need to water again for 10 days
• no concerns other than the fact that I believe industrial, business, and public (schools & city facilities) are some of the biggest users (and wasters). They need to be metered & measured as well & charged accordingly	• put them in & implement metering for everyone
• "City" and industrial users be made to implement as well try not to have everything green	• use amount used now less the 15-30% as the base amount to be used - only charge on amounts over that usage
• quit allowing developers to draw water from hydrants to spray down construction sites • no sale of water to out of towners by the truckload • no use of water to wash down logs	• more details from similar size cities who have changed to meters
• if you have older established yards like ours I would hope that an exception reduction could come into effect with usage	• through education
• public meetings with city council	• a lot of information must be given out to calm people down
• public hearings before meters and costs are mandated	• info must be clear - eg. costs to individual homeowner for installation; how rates will be set • as much info as possible should be available so we all understand what it means to us
• that our concerns are given attention & not just a formality of a decision already made!	• another open house with qualified professionals etc to address this particular concern
• look at all options • check out meters of different size houses & commercial building to see what the amount used is	• people with meters who grow vegetables and flowers (Bonafide growers) should only be charged the same rate in the summer as they consume in the winter
• City Council has to answer the questions concerning water going outside city limits; Music festival grounds, Vanderzam development, Gateway project, Chutter Project	

Question 10 – Other Comments

• make artificial grass available to homeowners at a good price & other incentives for homeowners to invest in artificial grass - likewise no watering, no mowers, no noise, no pollution • Question: Can we have our own well?	• to save money I would like to install my own - where can we purchase one? • I strongly recommend water metering be done as soon as possible as I see a lot of waste in this little city
• at the end of consultation process; if the metering program is necessary for preservation of our water system the city should make the decision regardless of public opinion. However, that being said the City, the School Board, and ALL businesses must be held equally accountable for their use and pay it accordingly, otherwise they will not conserve water.	• with our limited resources, why are we (Merritt) going full tilt with the planned large developments? The gated community of Armstrong St., the vineyard & gated community behind the Info Center, the golf course & residential development on the Music Fest. grounds. Shouldn't these large developments be put on hold till this issue is resolved?
• I understand why we need water meters & if I was to build a house on new property I would landscape to use very little water, since we live in the desert it would go with our surroundings. I would hate to have to cut the cedars since we are also living with global warming & are encouraged to plant more trees, shrubs, etc.	• grandfather current non-metered houses and change by-law so that upon sell/purchase of a house then a meter must be installed would spread the cost out and aid some of the pensioners in the community if individuals have to pay to install. If city is paying would spread the cost out.
• I have no problem with water conservation, however before going to water meters I would suggest that more rigorous water use policing be put in place outside of the by-law offices regular working houses - ie. Weekends & evenings	• info for the homeowner is too vague • is usage only for residential use or is commercial included • what about ranches in town & usage • how is City addressing water leaks
• we walk a lot and see a lot of waste. Homeowners watering the streets & sidewalk. • the city is the worst at their sites - the school board is the next worst	• no chlorination • we are a mill town - so we'll have higher use • have city make compost place for public & then sell composted materials for enrichment of grounds
• we had to pay for our meter & the installation. Recent suggestions said meters would be supplied - in which case I wish to be compensated for my costs	• put the damn things in • have a decent rate structure
• cut down the development • "all development isn't necessarily good. Look after the locals before developers"	• don't involve Urban Systems in anything to do with the project. Look at their abuse during the well drilling episode
• the tax payers of Merritt can't afford any more cost overruns eg. new well	• it must apply to everyone - all users
• I support water meters	• this may be a good time to install (back flush) valves
• what are the costs for the homeowner. A senior does not have much to spare	• we now have 1) hydro meters 2) gas meters 3) then why not water meters
• I feel we (each household) should be given the "average amount used as of today," free. Charges should only be applied to the usage that goes beyond & above the average per	• cost of installing meters is the city cost as per Parry Sound, Ontario paper on the internet • we must charge an above average rate for contractors using our water & putting sewer

household allowance. Then it is not a money grab & those that abuse the usage will pay their costs & not everyone as a whole will pay for the abusers.	into our system, including campers, etc.
the concept of water meters is not a real concern if it is done for the right reason	- Questions not answered: Would the cost of water out weigh the value of vegetables grown? - one idea to conserve water that Merritt should promote is California's slogan "If it's 'Yellow', let it mellow. If it's 'brown', flush it down."
it should have been done before plus sewer can be also related to amount of water to pick up high users – its time	