



Residential Water Use Survey for Fergus and Elora **Results and Analysis**

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Feb 18, 2010

Background

The Township of Centre Wellington (TCW) is in the process of completing their Water Servicing Master Plan (WSMP) for the Towns of Fergus and Elora. Several partners are working with the TCW, including the Grand River Conservation Authority (GRCA), the Elora Environment Centre and the POLIS Project on Ecological Governance (hence written as POLIS), interested in piloting a study using the concept of a 'Soft Path for Water'. This Soft Path for Water is a planning approach that attempts to change perceptions on water demand as an end product to water as the means to accomplish certain tasks (Brandes and Brooks, 2006). The focus of soft path is water demand management, as reducing water use through efficiency and conservation is much more economical and environmental than finding new sources of water supply. Demand management includes changing water use habits, utilizing technology and incorporating new practices, by promoting local public participation. More information the Soft Path for Water can be found in a document by Brandes and Brooks (2006).

Introduction and Purpose

As part of the WSMP update and incorporating Soft Path into these plans, it was imperative to gain a better understanding of the existing water using fixtures and practices in the residential sector. A water use survey was specifically designed for this project by the partners to be sent out to all residential water bill customers in the communities of Fergus and Elora in March 2009. The survey aimed to obtain information on water using fixtures, appliances and practices in Fergus and Elora and the frequency of their use. As an additional source of information on the habits of the residents, the survey included a check list of the measures residents have taken or are planning for water conservation.

This report is a summary of the results from the survey and some analysis of the results as it pertains to residential water used in Fergus and Elora. This information will be incorporated into additional analysis on building scenarios of water supply planning and water efficiency planning to aid the WSMP for Centre Wellington.

The report will be broken down similar to the survey, starting with information on demographics, then the water fixtures and appliances, outdoor water use and finally water conservation measures. Each section will include final results of both communities together, and separately. Finally, some analysis on residential water use that can be interpreted from these results is given.



Development of the Survey

The idea for the survey was rooted in the lack of current available information on Fergus and Elora, as the basis for the potential of water conservation and efficiency to change future demand within the TCW WSMP. The current situation would be used as the base case from which to build scenarios on water conservation and efficiency for the future. In cooperation with POLIS, the Elora Environment Centre, TCW and their consultants Triton Engineering, the Grand River Conservation Authority developed a water use survey specifically for this project. The data would be used as input into the ‘Scenario Builder’ by POLIS, a model which characterizes the current state of practice and allows for the municipality to develop scenarios of water conservation and efficiency through adoption of retrofits or replacements of fixtures. An understanding of the current state of practice for water using fixtures and appliances through this survey would be the starting point for the capabilities of water efficiency and conservation to allow for reducing demand in the Municipality.

The questions in the survey were derived and modified from Mayer and DeOreo (1999), to gather the necessary information for the Scenario Builder model inputs.

General Survey Information

The survey was a double-sided sheet sent out as an insert in the TCW Hydro bills to each residential billing customer in Fergus and Elora (see **Appendix A**). The water bills ran in 4 cycles or weeks – 1 for Elora and 3 for Fergus (see **Figure 1**) – with the survey insert, starting on March 26, 2009 and ending April 16, 2009. A postage paid envelope was also included, to facilitate the return of the surveys, as this was thought to increase survey response by eliminating the barrier of extra work and cost to the respondents.

Elora at that time had approximately 1790 billing customers, and Fergus had 4170 customers separated into 3 cycles, for a total of 5960 surveys sent out. Although the survey requested a return date of April 29, 2009, the last one to be included in the analysis was received on October 6, 2009, for a total overall return rate of 22.0%, or 1311 surveys. The cost of the survey printing and return postage totaled just over \$1200.

The results of the survey responses are detailed in the next sections.



Part A: Household and Residents

The majority of surveys were received from single family detached homes (80.8%), with townhouses and apartments being the next most popular residential units (7.9% and 7.6%, respectively). Approximately 94% of all residences were owned, which is an important consideration if residents are later solicited to retrofit or replace fixtures for more efficient models. Owners will more likely take ownership of the care of these units, whereas tenants may not have as much incentive.

The households had an average of 2.41 occupants in the winter, with a slight increase in summer population to 2.45 occupants, likely due to university-aged children returning home from school. The maximum number of residents was 7 in Elora and 8 in Fergus and the population distributions for each Town can be seen in **Figure 2**. Over half the households in Elora are 2-person households (53.1%), and for Fergus that percentage is 46.6%.

The number of occupants is an important factor in the amount that fixtures and appliances get used, including toilets, showers, dishwashers and clothes washers, and is a good check to determine whether usage is accounted for in the number of occupants in the household, or if higher usage could be attributed to over-usage.

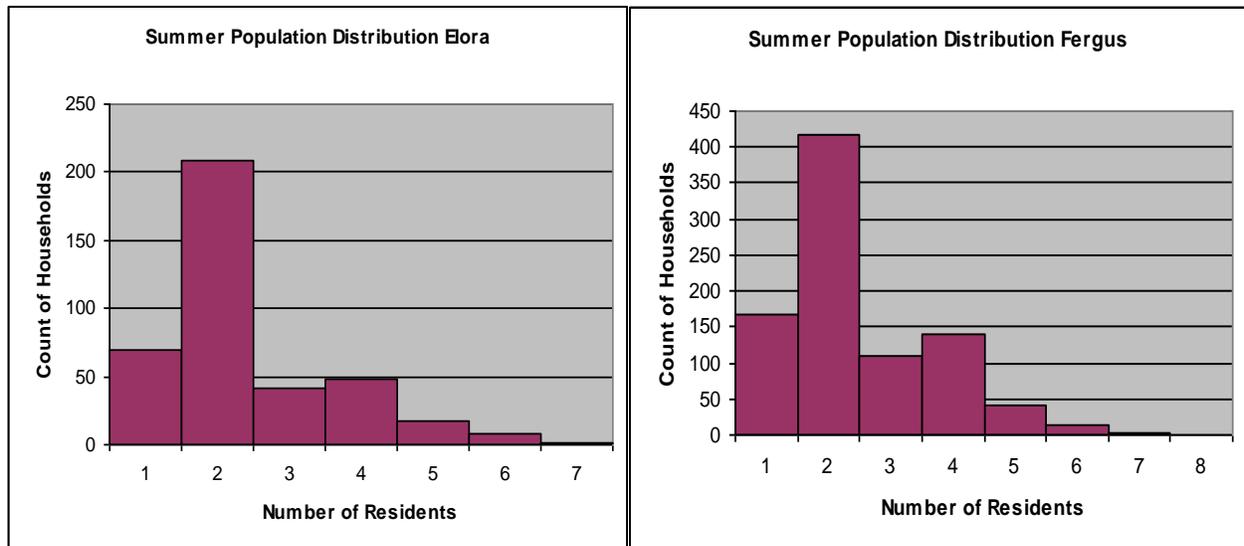


Figure 2. Population distribution of household residents in Elora and Fergus

Single occupant households are quite prevalent in Elora and Fergus, accounting for 18.5% and are the second highest count of households. Most of these single person households (61.1%) are in detached homes with another 9.6% as townhouse/condos, and of these two household types, 89.5% of them maintain and water their landscaping. For these households, the per capita water consumption is expected to be much higher as a result of the landscape maintenance requirements.

The age of the residence was asked to determine the number of homes that were built after the Ontario Building Code changed the standards for toilet sizes. In 1996, all newly built homes were required to install toilets with a maximum of 6 Litres per flush (LPF). If, later in the



survey, respondents did not know the volume of the toilets in their home, then houses newer than 1996 could be assumed to have toilets with 6 LPF. Of all the homes that were reported, 31.7% were homes newer than 1996, with a higher percentage of them occurring in the southern section of Fergus, and a higher percentage of newer homes in Elora than Fergus. The data seems to indicate a trend in newer homes in this area towards more multi-family buildings than single detached homes (see **Table 1**).

Table 1. Household and Residents Data for Elora and Fergus

	Elora	Fergus				Overall
		A	B	C	Total	
Survey Return Rate	22.29%	21.34%	20.37%	23.74%	21.87%	22.00%
% Single Family Homes	81.41%	85.31%	88.36%	70.72%	80.77%	80.90%
% Houses Newer than 1996	39.29%	18.26%	27.85%	44.87%	31.69%	34.08%
Average Winter Population (per household)	2.37	2.50	2.49	2.33	2.43	2.41
Average Summer Population (per household)	2.40	2.60	2.55	2.36	2.48	2.45
Overall Household Population Standard Deviation	1.16	1.20				1.19

The cycle with the highest return rate occurred in the area of Fergus that had the highest percentage of newer homes (see **bolded** values in **Table 1**), which may suggest that residents are moving into this area with a heightened concern for municipal issues and water conservation. This area of Fergus also had a substantially lower percentage of single family homes compared to the average.

Part B: Water Fixtures and Appliances

The fixtures and appliances discussed in this section include toilets, faucets with low flow attachments, dishwashers and clothes washers. The survey also took inventory and age of other fixtures that use water, including the number of water softeners, central humidifiers and outdoor pools.

Toilets

Toilets can be the greatest single water using device in a residential home, but also has the potential to be reduced considerably without too much effort on the home owner's part. The water savings by having lower flush toilets are considerable gains to the Municipality's water supply capacity. The survey requested respondents to check toilet tanks for the flush volume and report the number of each size on the survey. The average number of toilets per household was 2.09.

Many respondents still didn't know the volume of their toilets, as a first screening of the data resulted in almost 40% of toilets with unknown volume (see **Figure 3**). However, with the change in building codes in 1996, all surveys that reported that their house was built after 1996 with unknown volume toilets were considered to be 6LPF toilets, reducing the unknown volume percentage to 30.1% and increasing the percentage of toilets with 6LPF to 44.4% from 34.9%. The proportions of other toilet volumes are also seen in **Figure 3**.



There are still gains to be made for the Municipality, as toilets over 6LPF still account for over 18% of the toilets of known volume, and these can be more than 2 and 3 times the water volume per flush. Incentives could be made to increase the number of high efficiency (4 LPF or less) and dual flush (3-4 LPF and 6 LPF) toilets, as currently their percentages in the Towns of Fergus and Elora, are at only 3.2% and 4.0% of all toilets, respectively.

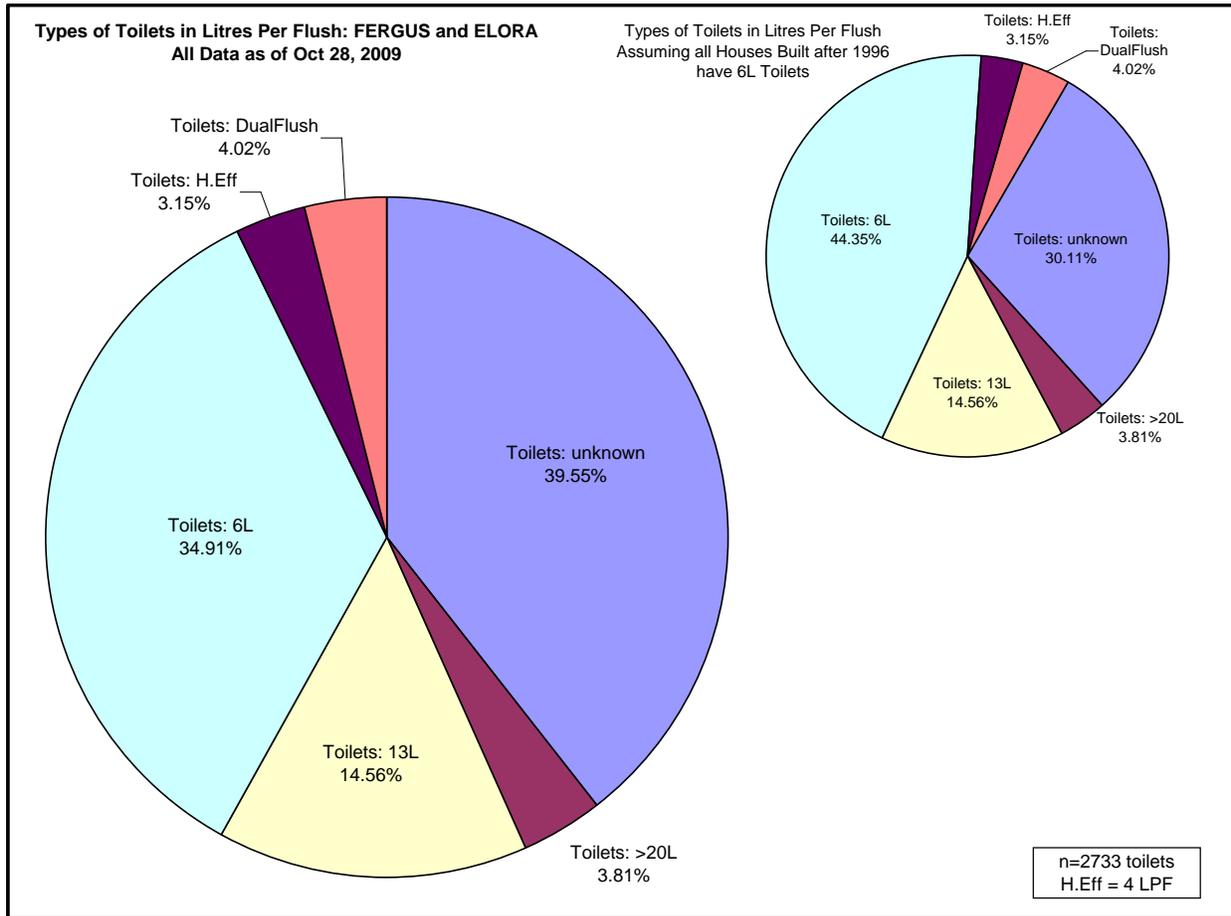


Figure 3. Toilet Volumes in Fergus and Elora households

Faucets and Low Flow Attachments

An inventory of the number of faucets, including bathroom sink, shower and kitchen sink was to compare how many had low flow aerators or attachments on them. TCW had a program to come in and install low flow showerheads for residents in the past so as follow up, a question included whether the low flow attachment was supplied by the Municipality. The average numbers of faucets were as expected: 2.2 bathroom faucets, 1.5 showerheads and 1.1 kitchen faucets per household.

Low flow showerheads occurred in almost half the households (48.1%), and the data seems to indicate that households with at least 1 low flow showerhead may have other showerheads without the low flow attachment. While the low flow showerheads were the most prevalent attachment at just over half (50.5%) the reported number of showerheads, very few of those were



listed as being installed by the Municipality, at only 7.1%. However, there are some discrepancies in the data regarding low flow showerheads. In Part D of the survey on water conservation actions, many more people, at 18.7% (instead of the 7.1%) listed that they had ‘maintained low flow showerhead given by Municipality’ despite stating it was not installed by them. Still a higher percentage (24.8%) of respondents overall, checked this option in Part D that they ‘maintained low flow showerhead given by Municipality’. This could mean that either the Municipality had supplied the low flow showerhead but had not installed it, or the questions were misinterpreted and they were maintaining low flow showerhead(s), regardless of who supplied it. Overall, low flow showerheads seem to be prevalent, but there are still many options to reduce water demand if the Municipality continued to provide these attachments, or if the residents purchase and install them on their own.

Installations of low flow attachments on bathroom faucets (34.2%) and kitchen faucets (39.7%) are less prevalent than showerheads. This could be a function of the large variety of types of bathroom and kitchen faucets available on the market and their inability to accommodate a standard low flow fixture. Showerheads are generally attached directly onto the pipe fixture coming out of the wall, are a self-contained unit and have standard fittings, whereas bathroom and kitchen faucets can have many different styles and a low flow aerator option may have to come from the manufacturer of that faucet instead of attaching a generic option. Another explanation of the lower occurrence could be that newer faucets could already have low flow capabilities without needing a retrofit, and these may not have occurred to the survey respondent if they were unsure of the flow rate of their faucet. The survey did not specify a cut-off flow rate that was deemed low flow so it was up to the respondent to decide whether or not their faucet could be considered low flow. However, the purpose of asking for numbers of faucets and the percentage of low flow attachments were more of a screening tool for average numbers throughout TCW for input into the model, than for assessing the prevalence of low flow attachments. This information could be useful for TCW if they decide to target low flow retrofits.

Water Using Appliances

The two main types of water using appliances in a household are dishwashers and clothes washers. The criterion for use was the number of loads that would account for typical usage each week.

Dishwashers occupy 72.7% of homes in Fergus and Elora. Most commonly, 2 to 4 loads per week are run, regardless of the number of occupants in the household. Typical usage was expected to be between 2 to 4 loads, so 5 or more loads per week, depending on household population, could be considered over-usage. From the data, it seems that approximately one load per person per week is a reasonable estimate of average use. In this respect, there is overuse in 17.5% of households with fewer than 4 people using 5 or more loads per week.

A distinction between the 2 types of clothes washers gives additional information on the amount of water usage for these appliances. Top-loading models are substantially higher in water usage than front loading machines, and this has been the target of the City of Guelph’s Smart Wash rebate program. If TCW were to do a similar rebate program to reduce the number of top-loaders, information on the percentage and usage is helpful. Top-loaders currently occupy almost two thirds of homes (63.8%), whereas front-loaders are in 32.7% of households and 5.7% did not report having a clothes washer. The percentages total greater than 100%, as some households



reporting using both front and top-loading washing machines (2.2%). As with dishwashers, typical usage for washing machines is 2 to 4 loads per week, without consideration of the number of occupants in the household. However, a greater proportion of the front-loaders (33.9%) than top-loaders (19.6%) had usage of 5 or more loads per week, although the number of occupants was only slightly higher in the front-loading households. The greater proportion may be attributed to front-loaders having smaller capacity than the top loaders, but whether the overall usage would be higher is dependent on the amount of water used per load. See **Table 2** for overall usage difference between front and top loading washing machines.

Table 2. Clothes Washing Machine Usage

Usage Per Week	Top Loading		Front Loading	
	% of survey respondents	Avg. # of Occupants	% of survey respondents	Avg. # of Occupants
<1 load/wk	22.22%	1.55	10.98%	1.79
2-4 loads/wk	57.71%	2.23	54.21%	2.53
5+ loads/wk	19.59%	3.44	33.88%	3.65
Don't Know	0.48%	1.67	0.93%	2.00

Other Water Using Fixtures

Water softeners and central humidifiers use little water, but are still included in calculations of residential water use in the Scenario Builder. Less efficient models are estimated through the age of the device and this information was requested from the respondents. Most homes have a water softener, at 80% of households and the average age of the units was 7.0 years, but the oldest one was 37 years old. Central humidifiers were not as common, at 20% of households, the average age of these was 6.88 years, and the oldest unit was 32 years. There were no differences in the results between Fergus and Elora.

Outdoor pools at certain times of the year are very water intensive, for the filling or replacement of water. The percentage of households with pools in Fergus and Elora was fairly low, at only 6.8% of the households overall, with no difference in the results between the two towns. The average age of the pools was 14.2 years, with the oldest being 37 years old.

Part C: Outdoor Water Use

Part C on outdoor water use was specific to the watering of lawns and gardens and what type of watering practices were used to irrigate. The frequency of watering in a dry year was the criterion to determine use, by five different irrigation methods. The five options for watering were automatic sprinkler, manual sprinkler, handheld hose, watering can or container and water from a rain barrel and the frequencies were dividing into four categories of rarely, once a week or less, 2 to 5 times a week or over 5 times a week. The distribution of different watering types and frequency can be found in **Figure 4**. The pie chart shows the relative popularity of each watering method or the likelihood that a watering method would be used, not the percentage of



homes that used each watering method as many of the respondents chose at least one watering method. The bar chart in **Figure 4** shows the typical weekly habits for each type of watering method. As many of the respondents chose at least one watering method, so **Table 2** shows the percentage of respondents who utilize each watering method. The types of watering accounts for the proportion of respondents who water their lawns and gardens, as 13.6% never water their lawns and gardens.

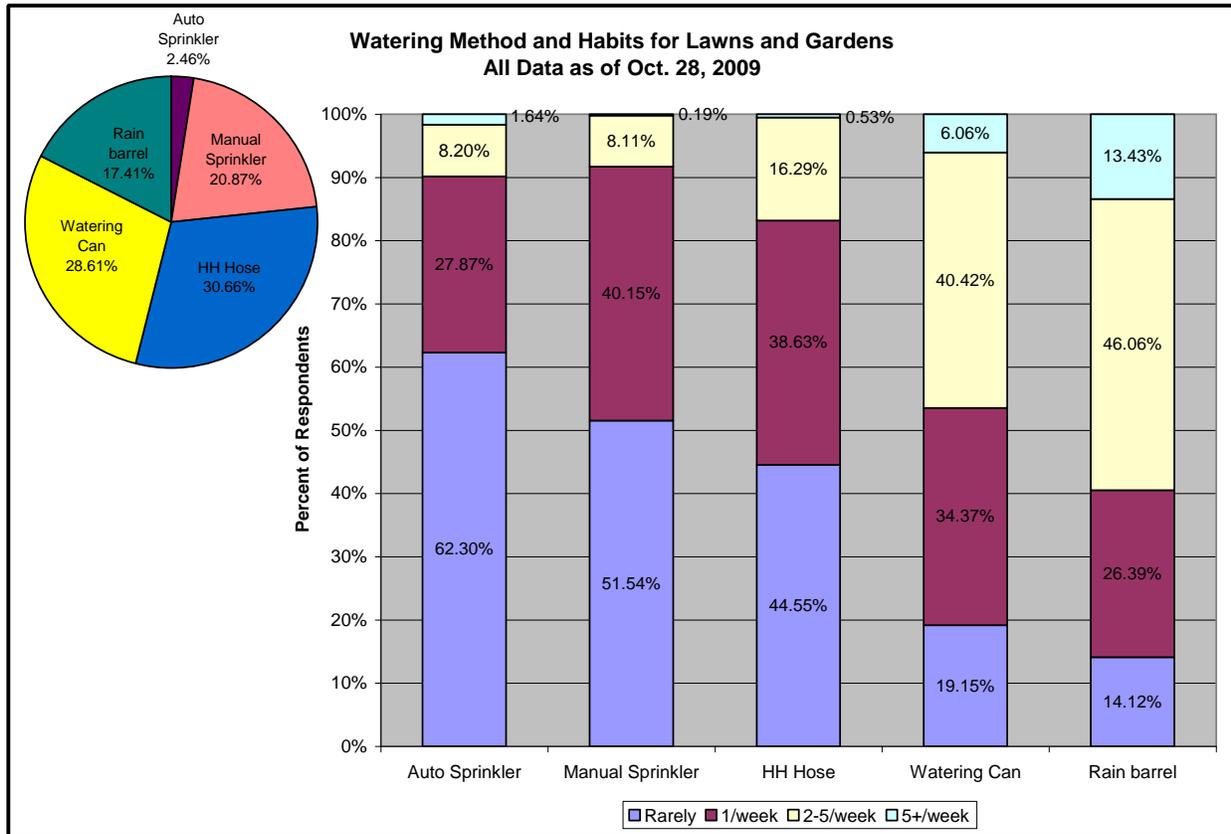


Figure 4. Lawn and garden watering methods and habits for Fergus and Elora

Table 2. Lawn and garden watering methods used by respondents

Percent of Respondents	Automatic Sprinkler	Manual Sprinkler	Handheld Hose	Watering Can	Rain barrel
Overall	4.65%	39.51%	58.05%	54.16%	32.95%
Elora	5.01%	44.36%	61.65%	55.14%	32.83%
Fergus	4.50%	37.39%	56.47%	53.73%	33.00%

Automatic sprinklers were defined as sprinklers with timers, and can often be inefficient if settings do not account for precipitation events. These were the least popular method of watering, used by only 4.7% of households, and most of the time (62.3%), the respondents used them only rarely, or less than once a week (27.9%). Respondents with automatic sprinklers generally used other forms of watering as well, as only 0.6% of respondents specified automatic sprinklers were their only form of watering method.

Rain barrels collect rainwater off roof tops, capturing a water source that would otherwise be lost to the environment, and is considered to be the most efficient water use for lawn and garden



watering as it uses no municipally supplied water source. Rain barrels are owned by one third of households, which was higher than expected.

Part D: Water Conservation

The last section of the survey included a list with check boxes for the water conservation actions that the household had already completed, or were planning in the next 12 months. These actions included simple tasks of turning off taps while brushing teeth, to the more extensive home water audit, which can be done through the Municipality to determine how to improve household water efficiency. The responder could choose as many actions as applicable to their household.

The conservation actions included actions that could be done in all water using aspects of the household, including the bathroom (showers, toilets, faucets), kitchen (dishwashing, faucets), outdoor water use (car washing, rain barrels, garden watering, mulching), laundry (efficient clothes washers) and generic uses such as checking for leaks or greywater re-use.

Figure 5 shows the number of responses for each water conservation action, for both completed and planned actions. The most popular action was turning off the taps while brushing teeth, which has been the target of many water conservation campaigns in the past several years. Other actions many households are employing include taking shorter showers, being more efficient when running dishwashers and clothes washers and being pro-active with outdoor water use by mulching, hand watering or just watering less. On average, households have done at least 7 water conservation actions, and are planning on doing at least one more in the next year.

Rain barrels were more popular than initially thought, at over one third of households (34.5%) already using, and another 16% hoping to get one in the next year. Rain barrels are the highest ranking planned water conservation action for Fergus and Elora residents over the next year.

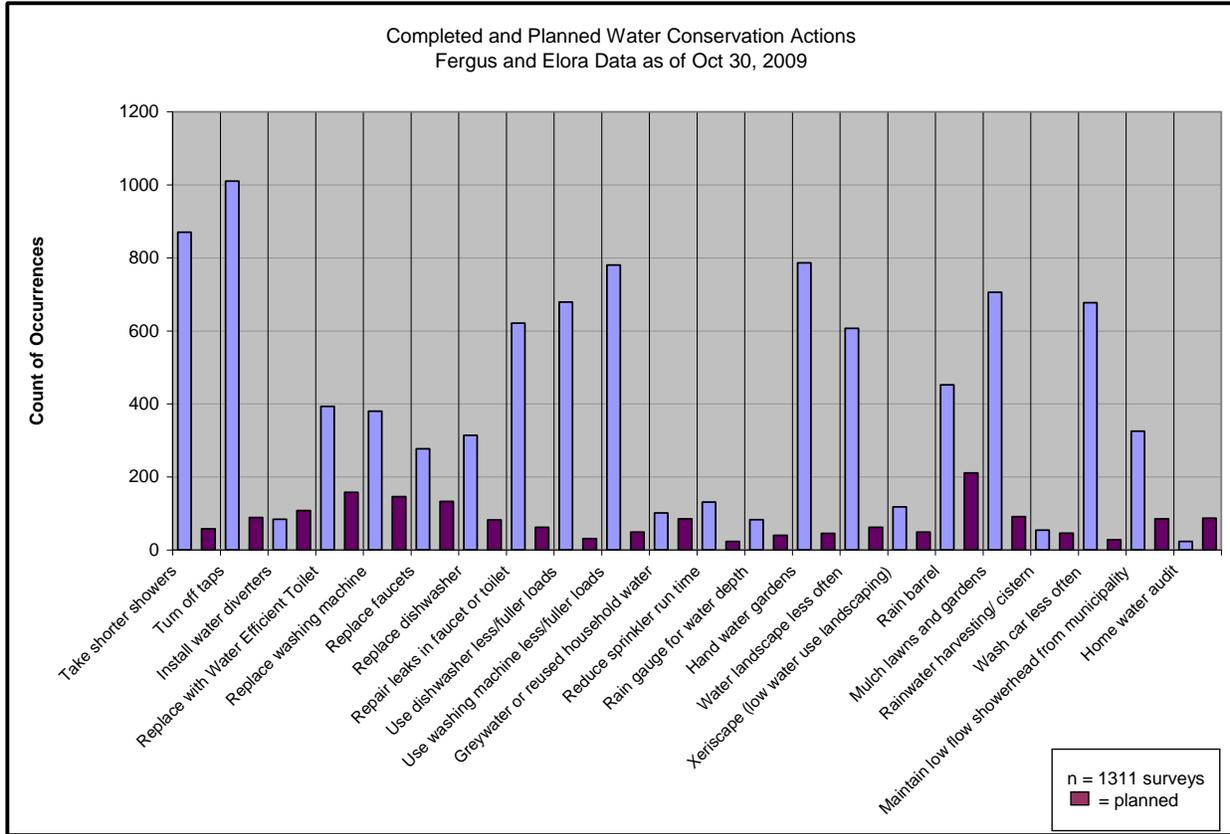


Figure 5. Completed and planned water conservation actions

Respondent Comments

Space at the end of the survey was available for any comments the respondent was willing to make regarding their water use and conservation efforts. There was a lot of positive feedback on water conservation efforts, some of which is listed below:

“We do not and have not watered lawn for years. Hand water flower pots and boxes when required”.

“Would buy another “Suds-Saver” washing machine”.

“Using dishpan to capture water from hand washing dishes (soapy water can be put on flower gardens to keep insects at bay). Also use water from basement humidifier for flower planters & pots”.

“I have conserved water for years. Grew up on farm and you did not waste water”.

“Any more efficient and we would be prunes!”

“Our rain barrels were amazing last year! (our first)”

“I water my hanging plants using my dehumidifier water all summer- it's just next to being distilled water.”

“Use water cautiously, have reduced consumption to 6.5 m³/month in 2008.”

“I do not water my lawn...if it rains...it gets watered!”

“I don't water lawn - don't like cutting grass! I don't wash car - don't like paying water bill”!

“I turn off shower and soap up; let grass “blonde” during dry spells & water shortages.”



“I think it is a very important issue to be looking at in today's day and age. I can go with a brownish lawn or a dirty car to help the environment.”

Comments had a recurring theme of re-use of water, such as additional ways that the households captured either greywater or rainwater instead of using municipally-supplied water. Several respondents mentioned cisterns to capture rainwater, while even more respondents used water from their dehumidifier for watering plants and lawns. Dish and bath water were also re-used for other watering needs around the house. Additionally, there were quite a few comments that stated that lawn watering only happened because of natural rainfall events, otherwise they did not irrigate.

Some comments were in regards to the need for additional incentives such as rebates for toilets and rain barrels, which would be helpful in getting the residents to switch to these water saving devices. Others noted that they were unaware of the availability of the home water audits, Municipality-supplied showerheads and where to find information on which water-saving washers (clothes and dishes) to purchase. This information could be easily advertised to the community with inserts into their water bill, in the same method as the survey information was distributed.

Optional Contact Information

The final section was an optional box to fill out the respondents' name, address and phone number. The information request was prefaced with assurance that their information would only be used for “survey quality control and the opportunity to do a follow-up” in case it was required. Surprisingly, almost two thirds (65.0%) of the surveys supplied enough contact information for follow-up. A benefit of including space for contact information is level of responsibility the respondent will feel for their answers, since it can now be tied to them and is not anonymous. In community-based social marketing theory, providing contact information has shown to result in higher accuracy and gives the respondents a sense of commitment to the program.

Lessons Learned

Survey Design

Confusion in filling out the survey is quite easy, especially when developing a new un-tested survey. Very special care is needed to reduce confusion as much as possible for the respondent. For instance, options given as multiple choice should begin with the least popular (perceived or hypothesized) option so the respondent has to read through most of the list before selecting an option. Giving the most generic option first leads to the respondent skimming over the rest or not filling out the survey correctly. For instance, we gave ‘unknown volume’ as the first choice for the type of toilets, whereas this should be the last as the others were specific volumes such as the current building code standard of 6 litres per flush (LPF). Many respondents checked this first option, and then continued to read and check off other options, leading to some uncharacteristically high number of toilets in some homes (5 or more is unlikely). Aside from calling the respondent (if contact information was given), the data would have to be taken for face value instead of through interpretation unless double-checks of accuracy were available (i.e. the total number of toilets didn't match the sum of the checked boxes).

Keeping the survey as simple as possible with check boxes, good organization of sections and as short in length as possible could mean the difference between a respondent filling in the



survey and ignoring it. Eliminating the barriers of time, cost and reducing the level of effort may have been the reason behind the high return rate of this survey (22%).

Survey Data Entry

Once the surveys were returned, the process of compiling the information digitally began. A spreadsheet was designed to aid the incorporation of information. A concise format was needed for ease of data entry (as there were 1311 surveys to key in), and once they were all entered, ease of reading and analysis. Utilities such as ‘Data Validation’ in MS Excel permit only certain text to be filled into the data entry form so that identical survey responses (such as multiple choice answers) were entered identically by selecting it from a dropdown list. This allows for a search of criteria of all identical responses for analysis later, using the AutoFilter utility. An image capture of the data entry forms can be seen in **Appendix B**. This spreadsheet was also used for the survey data analysis.

Conclusions

A survey on Residential Water Use for the communities of Fergus and Elora was very beneficial for determining the current state of water use and conservation amongst households. The return rate of 22% is very high for typical expectations, and may indicate that the residents of Fergus and Elora take great interest in their water supply and management. The survey focused on identifying how often water is being used throughout the household, and the residents’ awareness of water conservation actions. The results of the survey will be used to determine where water conservation and efficiency measures could be targeted by the Municipality to improve per capita use.

References

- Brandes, O.M. and D.B. Brooks. 2006. *The Soft Path for Water in a Nutshell*. Ottawa, ON and Victoria BC: Friends of the Earth Canada and the POLIS Project on Ecological Governance, University of Victoria.
- Mayer, P.W. and W.B. DeOreo (1999). *Residential End Uses of Water*. Denver, Colorado: American Water Works Association Research Foundation.



Appendix A

RESIDENTIAL WATER USE SURVEY

The Elora Environment Centre, the Township of Centre Wellington and the Grand River Conservation Authority are working in partnership to better understand residential water use for an upcoming Water Servicing Master Plan. This survey is to collect information for research purposes only and results will be reported only in anonymous summary form. Your participation ensures you have input in the process of creating the Water Servicing Master Plan. Please fill out the survey to the best of your ability; it should only take you a few minutes. Thank you for taking the time to help us with this important research.

Part A: Household and Residents

1. Please indicate the year this home was built: Year Built: _____ Don't know

2. Do you own or rent your place of residence? Own Rent

3. Please select your type of residence:

- | | |
|--|--|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Single family detached house..... <input type="checkbox"/> | Townhouse/ Semi-Detached..... <input type="checkbox"/> |
| Duplex..... <input type="checkbox"/> | Apartment/ Condo <input type="checkbox"/> |
| Triplex..... <input type="checkbox"/> | Other (please specify)..... <input type="checkbox"/> |

3. Please indicate (by circling) the number of people living in the household during the winter and summer months. (Note: we are trying to account for situations where university students return home for the summer or other situations when the number of people may change throughout the year).

Winter (Sep-Apr):	1	2	3	4	5	6	7	8+	Summer (May- Aug):	1	2	3	4	5	6	7	8+
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Part B: Water Fixtures and Appliances

4. Please indicate HOW MANY of the following water-using fixtures you have in your home:

- | | Number | | Number |
|--|-----------------|-----------------------------------|------------------------|
| Unknown volume..... | O1 O2 O3 O4 O5+ | 6 LPF (low flush) | O1 O2 O3 O4 O5+ |
| 20+ LPF | O1 O2 O3 O4 O5+ | High Efficiency (<5 LPF)..... | O1 O2 O3 O4 O5+ |
| 13 LPF | O1 O2 O3 O4 O5+ | Dual Flush Toilet (4 / 6 LPF).... | O1 O2 O3 O4 O5+ |
| <i>To check, lift the lid off the back of the toilet, the volume is often printed on the inside wall of the tank. (Look for the "LPF" – the Litres Per Flush)</i> | | TOTAL TOILETS..... | O1 O2 O3 O4 O5+ |

Indicate total and number with low flow aerators:

	Total Number of Faucets	How many faucets with Low Flow Aerators	Were the low flow units installed by the Municipality?
b. Bathroom Faucets	O1 O2 O3 O4 O5+	O1 O2 O3 O4 O5+	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know
c. Showers	O1 O2 O3 O4 O5+	O1 O2 O3 O4 O5+	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know
d. Kitchen Faucets	O1 O2 O3 O4 O5+	O1 O2 O3 O4 O5+	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know

5. Please check off which appliances you have in your home and how often you use them.

- | | | | | | |
|-------------------------------------|-------------------------------------|--|--|--------------------------------------|-------------------------------------|
| | <input checked="" type="checkbox"/> | Check the box that most closely represents your typical use. | | | |
| a. Dishwasher..... | <input type="checkbox"/> | <input type="checkbox"/> 1 load/wk or less | <input type="checkbox"/> 2-4 loads /wk | <input type="checkbox"/> 5+ loads/wk | <input type="checkbox"/> Don't know |
| b. Top-Loading Clothes Washer | <input type="checkbox"/> | <input type="checkbox"/> 1 load/wk or less | <input type="checkbox"/> 2-4 loads /wk | <input type="checkbox"/> 5+ loads/wk | <input type="checkbox"/> Don't know |
| c. Front-Loading Clothes Washer.... | <input type="checkbox"/> | <input type="checkbox"/> 1 load/wk or less | <input type="checkbox"/> 2-4 loads /wk | <input type="checkbox"/> 5+ loads/wk | <input type="checkbox"/> Don't know |

Thank you for your time and consideration. Please use the enclosed return envelopes to send in your survey to the Grand River Conservation Authority by April 29, 2009. Note, all individual information will be kept private and will only be used for our research purposes.



Appendix A

6. Please indicate if you have the following and the age of the unit.

Age of Unit
_____ years
_____ years
_____ years

- a. Water Softener Yes No Don't know
- b. Central humidifier (attached to furnace) Yes No Don't know
- c. Outdoor pool Yes No Don't know

Part C. Outdoor Water Use

7. Landscape: Do you maintain a lawn or garden? Yes No

8. If yes, please indicate how your lawn/garden is watered and how often it is watered during a DRY YEAR (i.e. 2007) from May to September.

How do you water lawns/ gardens?	<input checked="" type="checkbox"/>	On average, how often do you water your landscape? (please check the box that most closely approximates your watering)			
a. Automatic sprinkler/irrigation	<input type="checkbox"/>	<input type="checkbox"/> Rarely	<input type="checkbox"/> once/week or less	<input type="checkbox"/> 2-5 times /week	<input type="checkbox"/> 5+ times/week
b. Manual sprinkler	<input type="checkbox"/>	<input type="checkbox"/> Rarely	<input type="checkbox"/> once/week or less	<input type="checkbox"/> 2-5 times /week	<input type="checkbox"/> 5+ times/week
c. Handheld hose	<input type="checkbox"/>	<input type="checkbox"/> Rarely	<input type="checkbox"/> once/week or less	<input type="checkbox"/> 2-5 times /week	<input type="checkbox"/> 5+ times/week
d. Watering can/container	<input type="checkbox"/>	<input type="checkbox"/> Rarely	<input type="checkbox"/> once/week or less	<input type="checkbox"/> 2-5 times /week	<input type="checkbox"/> 5+ times/week
e. Using water from Rain barrel	<input type="checkbox"/>	<input type="checkbox"/> Rarely	<input type="checkbox"/> once/week or less	<input type="checkbox"/> 2-5 times /week	<input type="checkbox"/> 5+ times/week

Part D. Water Conservation

9. Please check all the water conservation measures you have completed and any you plan on doing within the next 12 MONTHS.

	Done	Planned		Done	Planned
Take shorter showers	<input type="checkbox"/>	<input type="checkbox"/>	Reduce run times on automatic sprinklers.....	<input type="checkbox"/>	<input type="checkbox"/>
Turn off taps while brushing teeth	<input type="checkbox"/>	<input type="checkbox"/>	Rain gauge for measuring water depth.....	<input type="checkbox"/>	<input type="checkbox"/>
Install water diverters in toilet	<input type="checkbox"/>	<input type="checkbox"/>	Hand-water gardens	<input type="checkbox"/>	<input type="checkbox"/>
Replace toilet with a water-efficient model.....	<input type="checkbox"/>	<input type="checkbox"/>	Water lawn, garden and shrubs less often.....	<input type="checkbox"/>	<input type="checkbox"/>
Replace washing machine with a water-efficient model.....	<input type="checkbox"/>	<input type="checkbox"/>	Install low-water-use landscaping (xeriscape).....	<input type="checkbox"/>	<input type="checkbox"/>
Replace faucets with a water-efficient model ...	<input type="checkbox"/>	<input type="checkbox"/>	Rain barrel for lawn/garden watering	<input type="checkbox"/>	<input type="checkbox"/>
Replace dishwasher with a water-efficient model	<input type="checkbox"/>	<input type="checkbox"/>	Mulch on lawn or gardens	<input type="checkbox"/>	<input type="checkbox"/>
Repaired leaks in faucet/toilet.....	<input type="checkbox"/>	<input type="checkbox"/>	Other rainwater harvesting/cistern	<input type="checkbox"/>	<input type="checkbox"/>
Use dishwasher less/use fuller loads.....	<input type="checkbox"/>	<input type="checkbox"/>	Wash car less often	<input type="checkbox"/>	<input type="checkbox"/>
Use washing machine less/use fuller loads.....	<input type="checkbox"/>	<input type="checkbox"/>	Maintain low flow showerheads given by municipality	<input type="checkbox"/>	<input type="checkbox"/>
Use greywater/reused household water.....	<input type="checkbox"/>	<input type="checkbox"/>	Had a home water audit done	<input type="checkbox"/>	<input type="checkbox"/>
Others (please specify): _____					

10. Other Comments regarding your water use and conservation efforts.

Optional: Please fill in your name, address & phone number. The reason we request this information is for survey quality and control and the opportunity to do a follow-up with a cross-section of the survey base.

Name:		Phone #:	
Address:		Town:	

Thank you for your time and consideration. Please use the enclosed return envelopes to send in your survey to the Grand River Conservation Authority by April 29, 2009. Note, all individual information will be kept private and will only be used for our research purposes.



Appendix B: Survey Data Entry Spreadsheets

Microsoft Excel - Survey_data_entry.xls

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Type a question for help

90% Arial 10 B I U

1	Question #	1	2	3 (call it 2a)	3a	3b	4a (i)	4a (ii)	4a (iii)	4a (iv)	4a (v)	4a (vi)	4a (vii)	4b (i)	4b (ii)	4b (iii)	4c (i)	4c (ii)	4c (iii)	4d (i)		
2	ID	Paper Colour	Year Built	Own/Rent	Residence Type	Winter Pop'n	Summer Pop'n	Toilets: unknown	Toilets: >20L	Toilets: 13L	Toilets: 6L	Toilets: H.Eff	Toilets: DualFlush	Toilets: Total#	Bathroom Faucet#	Bathroom Faucet Low#	Bathroom Faucet Install?	Shower #	Showerhead Low#	Showerhead Install?	Kitchen Faucet#	
3	Options	Blue	<i>Enter the year the house was built</i>	Own	Single Family	<i>Number of people</i>	<i>Number of people</i>	1	1	1	1	1	1		1	1	Yes	1	1	Yes	1	
4		Green		Rent	Duplex			2	2	2	2	2	2	2		2	2	No	2	2	No	2
5		Grey			Triplex				3	3	3	3	3	3		3	3	Don't Know	3	3	Don't Know	3
6		Yellow			Townhouse/Sem		<i>living here in the winter</i>		4	4	4	4	4	4		4	4		4	4		4
7					Apartment/Condo		<i>living here in the summer</i>		5	5	5	5	5	5		5	5		5	5		5
8				Other: specify																		
9	001																					
10	002																					
11	003																					
12	004																					

Parts A-C Part D Comments&Name

Ready NUM

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Type a question for help

90% Arial 10 B I U

1	4d (ii)	4d (iii)	5a	5b	5c	6a (i)	6a (ii)	6b (i)	6b (ii)	6c (i)	6c (ii)	7	8a	8b	8c	8d	8e	---	---
2	KitchenF Low#	Kitchen Faucet Install?	Dishwasher	Top Loader	Front Loader	Water Softener	Water softener Age	Central humidifier	Humidifier Age	Outdoor Pool	Pool Age	Land scape	Auto Sprinkler	Manual Sprinkler	HH Hose	Watering Can	Rainbarrel	Created by	Date Received
3	1	Yes	N/A	N/A	N/A	Yes	<i>Indicate age of Water Softener</i>	Yes	<i>Indicate age of Central Humidifier</i>	Yes	<i>Indicate age of outdoor pool</i>	Yes	N/A	N/A	N/A	N/A	N/A	<i>Please type in your name</i>	<i>Enter date the survey was received (dd-mmm-yy) i.e. 14-Mar-09</i>
4	2	No	<1 load/wk	<1 load/wk	<1 load/wk	No		No		No		No	Rarely	Rarely	Rarely	Rarely	Rarely		
5	3	Don't Know	2-4 loads/wk	2-4 loads/wk	2-4 loads/wk	Don't Know		Don't Know		Don't Know		1/week	1/week	1/week	1/week	1/week	1/week		
6	4		5+ loads/wk	5+ loads/wk	5+ loads/wk							2-5/week	2-5/week	2-5/week	2-5/week	2-5/week	2-5/week		
7	5		Don't Know	Don't Know	Don't Know							5+/week	5+/week	5+/week	5+/week	5+/week	5+/week		
8																			
9																			
10																			
11																			
12																			

Parts A-C Part D Comments&Name

Ready NUM



Appendix B: Survey Data Entry Spreadsheets

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Type a question for help

BD19

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH		
1	Part D		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p																		
2	Options	Blue	Take shorter showers	Turn off taps	Install water diverters	Replace with Water Efficient Toilet	Replace washing machine	Replace faucets	Replace dishwasher	Repair leaks in faucet or toilet	Use dishwasher less/fuller loads	Use washing machine less/fuller loads	Greywater or reused household water	Reduce sprinkler run time	Rain gauge for water depth	Hand water gardens	Water landscape less often	Xeriscape (low water use landscaping)																		
3		Green																																		
4		Grey																																		
5		Yellow																																		
6																																				
7																																				
8	ID	Paper	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan
9	001	0																																		
10	002	0																																		
11	003	0																																		
12	004	0																																		
13	005	0																																		

Ready NUM

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Type a question for help

BD19

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF
1	q	r	s	t	u	v	w																	
2	Rain barrel	Mulch lawns and gardens	Rainwater harvesting/ cistern	Wash car less often	Maintain low flow showerhead from municipality	Home water audit	Other (please specify)	Other Water Conservation Measures	Count of Done	Count of Plans	Created by	Date Received	Date Entered	Additional Comments (#3)										
3																								
4																								
5																								
6																								
7																								
8	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan	Done	Plan										
9															0	0								
10															0	0								
11															0	0								
12															0	0								
13															0	0								

Ready NUM

Microsoft Excel - Survey_data_entry.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

A9 =Parts A-C!A9

	A	B	C	D	E	F	G	H	I
1	Question #		10	11a	11b	11c	11d	---	---
2	ID	Colour	Comments	Name	Address	Phone #	Town	Created by	Date Received
3									
4	Blue								
5	Green	Please enter in any comments they may have regarding water use and conservation efforts							
6	Grey								
7	Yellow								
8									
9	001	0							
10	002	0							
11	003	0							

Ready NUM