City of Guelph

Water Conservation and Efficiency Strategy Update

Public Information Centre

August 27th 2008

Guelph Holiday Inn
Oakwood Ballroom
601 ScottsdaleDrive
Guelph ON

Agenda

6:00 pm	Arrival – review of information display boards
6:30 pm	Presentation
	Background
	Scope of Project
	Results to Date
7:30 pm	Break
7:45 pm	Working Groups
8:30 pm	Review of Comments from Working Groups
8:50 pm	Next Steps
9:00 pm	Adjourn

WATER CONSERVATION & EFFICIENCY STRATEGY UPDATE

Background

In 2004, the City of Guelph initiated the Guelph Water Supply Master Plan to evaluate preferred supply alternatives to service and sustain future development and to meet water supply requirements for projected community growth. Through the development of the Water Supply Master Plan, three key facets were identified as the preferred short-term options to reclaim critical supply capacity in association with optimization and rehabilitation of current supply-based infrastructure:

- The employment of an enhanced water conservation and efficiency strategy,
- Mitigation of distribution-based water loss, and
- Education/policy/rate based reviews.

The City, contingent upon the success of aggressive water conservation and efficiency programs, identified the following overall targets in support of growth:

- Reduction of 10% (8,000 m3/day) total water consumption by 2010.
- Reduction of 15% (12,000 m3/day) total water consumption by 2015.
- Reduction of 20% (16,000 m3/day) total water consumption by 2025.

Current Initiatives

Royal Flush Toilet Rebate Program

- Since 2003, over 5,000 rebates have been issued with approximately 500 m3 per day of water savings.
- During 2008, the program has set a goal of 2,000 toilet replacements between residential, multi-residential and Industrial, Commercial and Institutional (ICI) based sectors.

Outdoor Water Use Program

- Program first introduced in 2001.
- Outside water restrictions based on watershed changes through the Ontario Low Water Response Procedure and local water supply thresholds.
- The City of Guelph currently has one of the lowest levels of seasonal water increases (peaking factors) in the Province of Ontario.

Landscape Assessment Pilot Program

- Guelph residents and area businesses are able to book a complimentary 30 minute consultation with a City Landscape Advisor to review their landscape and discuss alternatives to make their property more water efficient, naturally beautiful and pesticide free.
- On August 8, 2008 the program reached 500 visits, full subscription for the 2008 season.

Industrial, Commercial and Institutional (ICI) Water Capacity Buyback Program

- This program helps large area water users meet greater water efficiency practices through the 'buy-back' of water capacity reclaimed through the introduction of site-based retrofits.
- In 2007, a 312 m3 per day water saving retrofit was completed at University of Guelph that has now become a case study for the buy back program.
- In 2008, work at UG has continued and the City has began working with Cargill Meat Solutions, focusing on cooling and cleaning system retrofits.

City Facility Water Efficiency Retrofits

- In 2008, City staff continued efforts to further water conservation and efficiency within City Facilities. This year's retrofits include the Centennial and Exhibition Arenas.
- Each retrofit initiative also includes supportive educational materials.

Smart Wash Front-Loading Washing Machine Pilot Rebate Program

- The City's Environmental Services Department launched the pilot program on February 1st, 2008.
- Guelph residents who purchase an Energy Star approved front-loading washing machine are eligible for a rebate of $80 from the City and $20 from Guelph Hydro Electrical Systems, our program partner.
- In May of 2008 the pilot program was expanded by an additional 200 rebates in response to program popularity and community participation.
- On July 25, 2008 the program reached its goal of 500 rebates.
- Industry-based benchmarks suggest an expected savings of 68 litres per day for a family of three.

Public Education and Outreach

The City of Guelph leads and participates in many community outreach initiatives including:

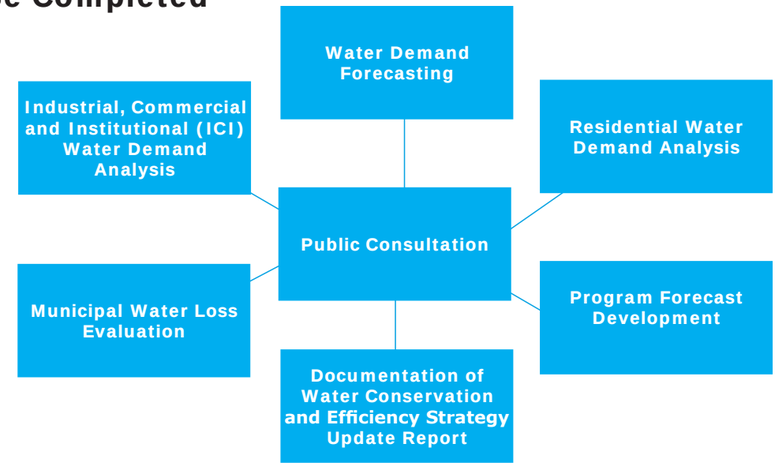
- GIRC Residential Outdoor Water Efficiency Workshops; Green Impact Guelph; Guelph Water Conservation Breakfast; Waterworks Open House; Guelph Spring Home Show; Guelph Water Efficiency Awards; Speed River Clean Up; Waterloo Wellington Children's Groundwater Festival; and in-store instant rebate events and promotions.

WATER CONSERVATION & EFFICIENCY STRATEGY UPDATE

Overview

The City of Guelph is currently undertaking an update to the City's 1999 Water Conservation and Efficiency Study. The 2008 Water Conservation and Efficiency Strategy Update will evaluate various water conservation programs, policies and resource alternatives and upon completion will form a comprehensive community based action strategy to best meet the water demand reduction targets of the City's 2006 Water Supply Master Plan.

Tasks To Be Completed



Public Consultation

This task includes the completion of a comprehensive public consultation program to collect and incorporate public and stakeholder input into the strategy. The public consultation program for the strategy update includes:

- Public Meetings
- Residential Market Research Studies – Telephone Surveys and Focus Groups
- Formation of a Conservation and Efficiency Public Advisory Committee (WCEPAC)

Municipal Water Loss Evaluation

This task includes the evaluation and verification of unaccounted and un-metered water volumes to identify the City's potential for water loss reduction with reference to industry based standards and best practices. This analysis includes:

- Evaluation and validation of water balance audits and associated water loss accounting techniques utilized by the City of Guelph Waterworks staff for 2006 and 2007.
- Development of confidence intervals for all data sets and the assessment of possible impacts in non-metered water usages.
- Identification of potential savings in distribution system-based water loss in comparison to industry standards and global municipal models.

Industrial, Commercial and Institutional (ICI) Water Demand Analysis

This task includes the analysis of current industrial, commercial and institutional sector water consumption and identification in potential water savings based on the nature of water consumption within these respective sectors. This analysis includes:

- Evaluation of water use by nature of business within the City's ICI sector.
- Analysis and disaggregation of process and domestic water use at large water users based on employment information.
- Evaluation of potential efficiencies based on ICI Water End Use Audits completed throughout North America.

Water Demand Forecasting

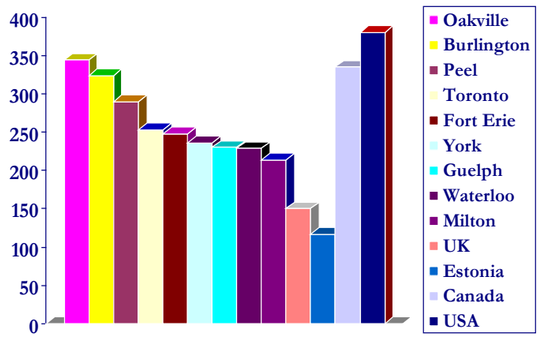
This task includes the update and modification of water supply demand forecasts completed through the City's 50 year Water Supply Master Plan through reference to population projections identified through the City's 2008 Local Growth Management Strategy.

WATER CONSERVATION & EFFICIENCY STRATEGY UPDATE

Residential Water Demand Analysis

This task includes the analysis of current residential water use and the identification of potential water use efficiencies for the City's housing stock. Important factors include how water is used in the home and what fixtures or appliances may be in place based on building standards at the time of home construction. This analysis includes:

- Detailed analysis of per capita and individual household residential water consumption for the period of 1997 to 2007.
- Evaluation of total household water usage versus construction period of homes for all City of Guelph residential properties.
- Evaluation of residential end-use and water efficiency based on amendments to new home water efficiency construction standards through the Ontario Building Code.
- Analysis of expected changes in residential water end-use based on industry trends and the expected natural replacement of home based appliances and fixtures.
- Identification of the City's current potential for residential water efficiency.



Residential Water Use Demand Analysis
(Litres Per Capita Per Day)

Program Forecast Development

This task includes the development of a detailed implementation plan identifying the sequencing and timing of preferred water conservation and efficiency programs and supporting resources required to meet the reduction targets of the 2006 Water Supply Master Plan.

The finalized implementation strategy will serve as the primary financial planning reference tool for the City of Guelph's Water Conservation and Efficiency Program and provide justification and support for the addition of future program alternatives and related resources.

Documentation of Water Conservation and Efficiency Strategy Update Report

The project will be documented in a Water Conservation and Efficiency Strategy Update report. This report will be accessible by the public following endorsement by Guelph City Council.

Timing

Many of the research components of the Water Conservation and Efficiency Strategy Update are currently underway. Following completion of the strategy update public consultation program, and development of a Guelph Water Conservation and Efficiency Strategy Update Final Report, it is anticipated that the final study and supporting water conservation program forecasts will be brought before Guelph City Council in December 2008 for endorsement.

Contact Us

If you are unable to attend the Public Information Centre and wish to comment on this project or receive information, please contact:

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WATER CONSERVATION & EFFICIENCY STRATEGY UPDATE

Public Information Centre

August 27, 2008

Guelph water
Ours to conserve. Ours to protect. Ours to enjoy.

WATER CONSERVATION AND EFFICIENCY STRATEGY UPDATE

PUBLIC INFORMATION CENTRE

Wednesday, August 27th 2008

RMSi Resource Management Strategies Inc.
Protecting resources for future generations

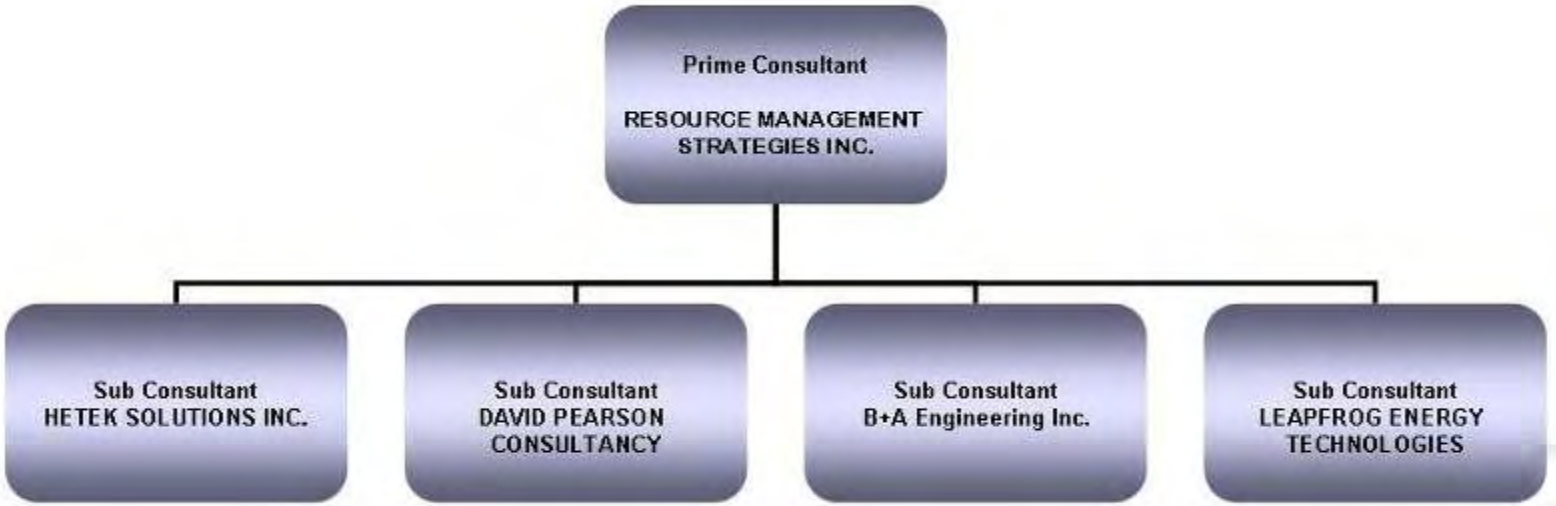
Michael Brooks

Welcome to Public Information Centre

Meeting Agenda

- 6:00 pm Arrival – Review of information display boards
- 6:30 pm Presentation
  - Background
  - Scope of Work
  - Results to Date
  - Water Conservation and Efficiency Alternatives
- 7:30 pm Break
- 7:45 pm Working Groups
- 8:30 pm Review of Comments from Working Groups
- 8:50 pm Moving Forward and Next Steps
- 9:00 pm Adjourn

Project Team Introductions



Project Scope

and

Planned Activities

Guelph has a rich environmental tradition…

Royal Flush TOILET REBATE PROGRAM

University of Guelph Guelph Turfgrass Institute & Environmental Research Centre

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Activities Undertaken since 1999 Plan

- Royal Flush Toilet Rebate Program
    - over 5,000 rebates issued since 2003
    - program goal of 2,000 rebates in 2008 for both Residential and ICI
- Smart Wash Clothes Washer Rebate Pilot Program
    - pilot program reached full subscription of 500 rebates in June 2008
- Industrial Commercial and Institutional Water Capacity Buyback Program
    - University of Guelph
    - Cargill Meat Solutions
    - TDL Canada Ltd.
- Landscape Assessment Pilot Program
    - launched in May 2008, goal of 500 landscape assessments reached for 2008 season

Activities Undertaken since 1999 Plan

- City Facility Water Efficiency Retrofits
  - Victoria Road Recreation Centre
  - City's Centennial and Exhibition Arenas
- Public Education and Outreach
  - Guelph International Resource Centre (GIRC), Outdoor Water Efficiency Workshops
  - Green Impact Guelph (GIG) Partner
  - Guelph Water Conservation Breakfast
  - Waterworks Open House
  - Guelph Spring Home Show
  - Guelph Water Efficiency Awards
  - Presence at numerous community events

Understanding the Assignment

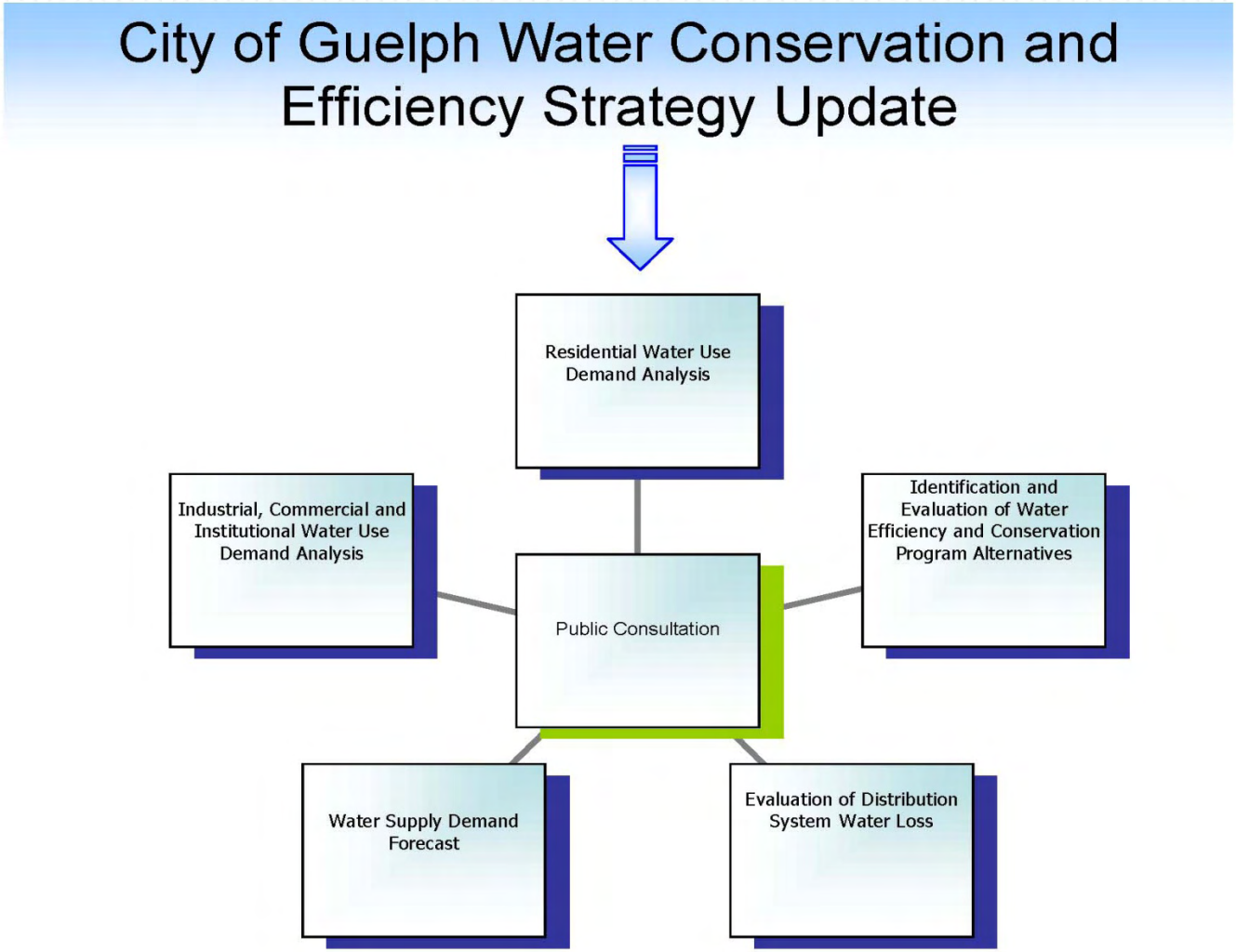
Develop a comprehensive community-based Water Conservation and Efficiency Strategy Update that will define preferred program alternatives, associated water savings, program implementation forecasts, and support staff and maintenance based on resources required to meet the water reduction goals identified in the Guelph Water Supply Master Plan within a 20 year planning horizon.

Critical Factors:

- Vulnerable groundwater source
- Projected future growth
- Assimilate capacity thresholds of watershed for wastewater discharges

City of Guelph Water Conservation and Efficiency Targets:

- Leader in conservation and resource protection/enhancement
- Use less energy and water per capita than any comparable Canadian City
- Average Day Water Use Reduction of 10% by 2010, 15% by 2015 and 20% by 2025


City of Guelph Water Conservation and Efficiency Strategy Update
Residential Water Use Demand Analysis
Industrial, Commercial and Institutional Water Use Demand Analysis
Identification and Evaluation of Water Efficiency and Conservation Program Alternatives
Public Consultation
Water Supply Demand Forecast
Evaluation of Distribution System Water Loss

Approach

Public and Stakeholder Consultation

Public input and feedback is key to success of the study and development of a Guelph specific strategy. The Public and Stakeholder Consultation Program includes:

- Public Information Centre (2)
- Residential Focus Groups (3)
- Residential Market Research Call Survey
- Water Conservation and Efficiency Public Advisory Committee

Approach

Residential Water Use Demand Analysis

- Disaggregation of water billing data from Guelph Hydro Utility
- Comparison of existing housing stock and water consumption to Ontario Building Code new construction based water efficiency building standards
- Merging and comparison of water billing database and Tax Assessment housing data base
- Evaluation of current water efficiency market saturation
- Evaluation profile of residential water use demand based on vintage of housing

Approach

Industrial, Commercial, Institutional Water Use Demand Analysis

- Disaggregation of water billing data from Guelph Hydro Utility
- Evaluation of top 100 water users
- High level assessment completed through analysis of water billing data and publicly available statistical and business registration information (NAICS)
- Apply end use data available from Guelph water billing information and RMSi database of over 165 ICI program participants in City of Toronto
- Estimate industrial sector potential for water efficiency potential opportunities and associated costs

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Protecting resources for future generations

Approach

Evaluation of Distribution System Water Loss

- Gathering data regarding distribution system and water delivery
- In-depth review of existing water accounting and historic water balance audit
- Develop models to summarize gathered data
- Run data through IWA software spreadsheets
- Determine confidence level of available data and outcomes
- Develop water loss management strategy based on City's objectives and economic feasibility

Approach

Water Supply Demand Forecasts

- Review the "success" of existing water demand forecast in the Water Supply Master Plan to actual demand and determine recommended changes in methodology
- Review planning documents including Official Plan, Local Growth Management Strategy and Places to Grow Act
- Water demand data will be reviewed for recent years to calculate unit consumption rates and peaking factors for each component of the forecast

Water Supply Demand Forecasts

- Demand forecast developed using updated population and land use projections as well as calibrated factors
- Forecast will include effects of conservation based on outcomes of the water efficiency plan

Approach

Identification and Evaluation of Water Efficiency/Conservation Program Alternatives

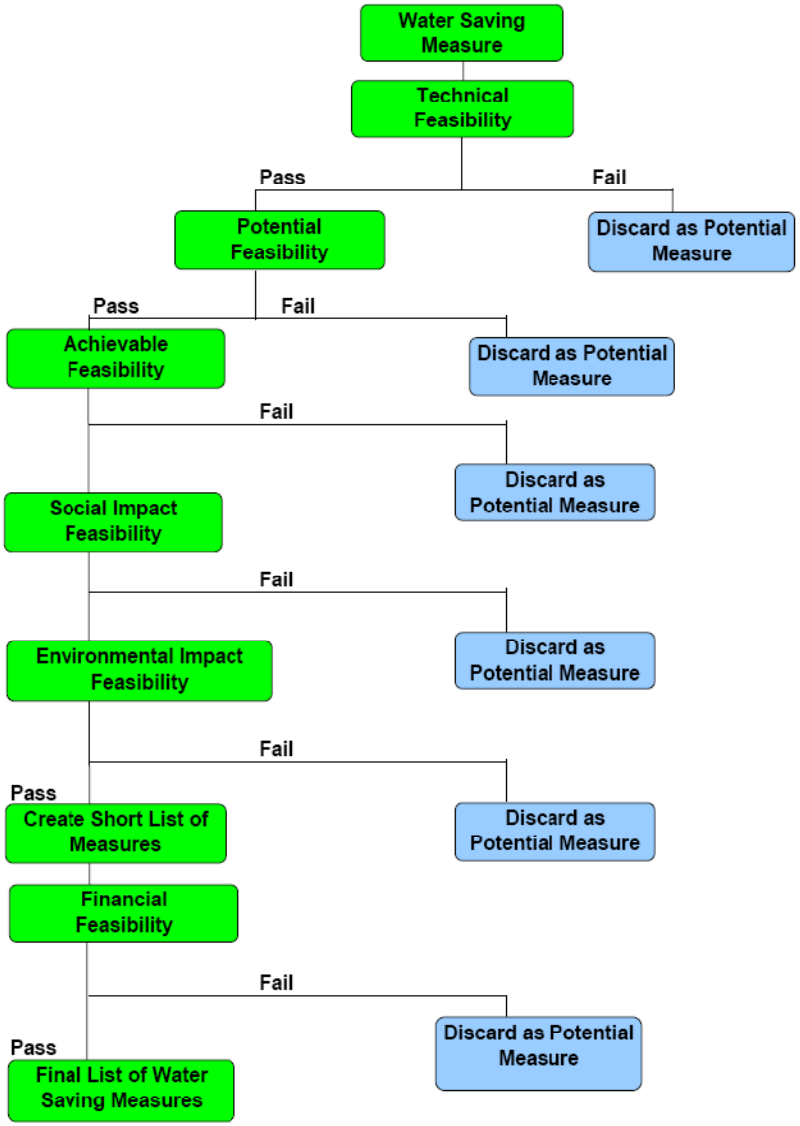
- Literature and internet search of existing potential measures
- All alternatives will be extensively reviewed, no measure will be discarded simply because it's not popular with other Ontario/North American municipalities
- Proper consideration of critical factors pertaining to Guelph's water supply, community and stakeholder feedback and the objectives of the City and City Council through the review of all measures
- Alternative evaluation will also provide focus on innovation

Identification and Evaluation of Water Efficiency/Conservation Program Alternatives

Screening of Each Measure

- Expanded "triple baseline analysis"

Water Efficiency Screening Process



Identification and Evaluation of Water Efficiency/Conservation Program Alternatives

Individual business cases for the preferred alternatives to be developed. Business cases to include:

- measure description
- measure cost
- measure life expectancy
- estimated water savings
- details, level and type of incentives
- estimated participation rate
- overall target water savings
- monitoring/evaluation costs
- maintenance costs
- additional City staff positions as required

Identification and Evaluation of Water Efficiency/Conservation Program Alternatives

- Extensive public consultation throughout the process

Approach

Strategy Implementation Plan

- Sequencing and timing of preferred water efficiency and conservations programs
- Supporting staff resources
- Identification of potential partnerships
- Financial planning reference tool
- Align with City's annual budget reporting format
- Timelines and reporting

Added Value Services

Water Loss Mitigation Strategy

- Review of current operational and maintenance practices

Residential Focus Groups

- Facilitated by market research firm
- Three (3) focus groups, approx. 90 minutes each
- To support the quantitative research

In Conclusion

- Complete understanding of the project and Guelph's unique situation and objectives
- Understand the need for comprehensive and thorough public consultation
- Our team members have been carefully chosen because of their expertise in areas important to Guelph
- Our team will implement the project with the highest standard and integrity, on time and on budget

Focus Groups – Qualitative research

- Held on April 22nd, 2008 at a professional focus group facility in Guelph. Randomly recruited to meet the following specifications:

  - Men and Women
  - 25 years and older
  - Home owners
  - Responsible for monitoring and paying the bills
  - Three groups – Mix of different home ages, homes less than 10 years old and homes 11+ years old

Key Insights from Focus Groups

1. Guelph residents are placing considerable emphasis on water efficiency and water conservation in their households
2. Water conservation has become more important over the past several years
3. Significant improvements in water efficiency involve modifying societal values and behaviours as much or more as the individual residents
4. Guelph residents are well along a path relating to becoming more water efficient, and seem ready to continue the trend

Telephone Surveys – Quantitative Research

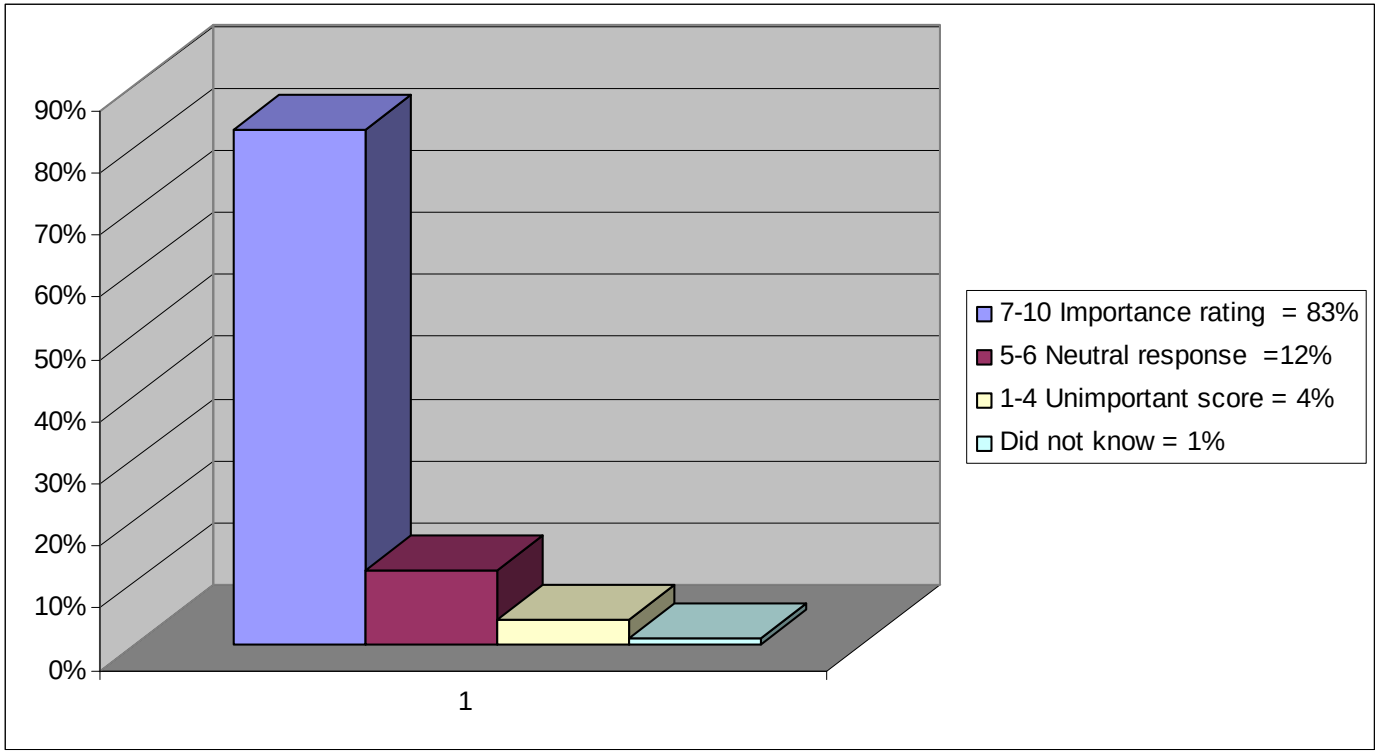
- 400 randomly selected Guelph households, with municipal water supply, were interviewed by telephone between June 23rd and June 30th, 2008
- Residents were asked a series of questions pertaining to water and conservation in their community
- Questions were a series of scaled, open ended and closed questions

A snapshot…

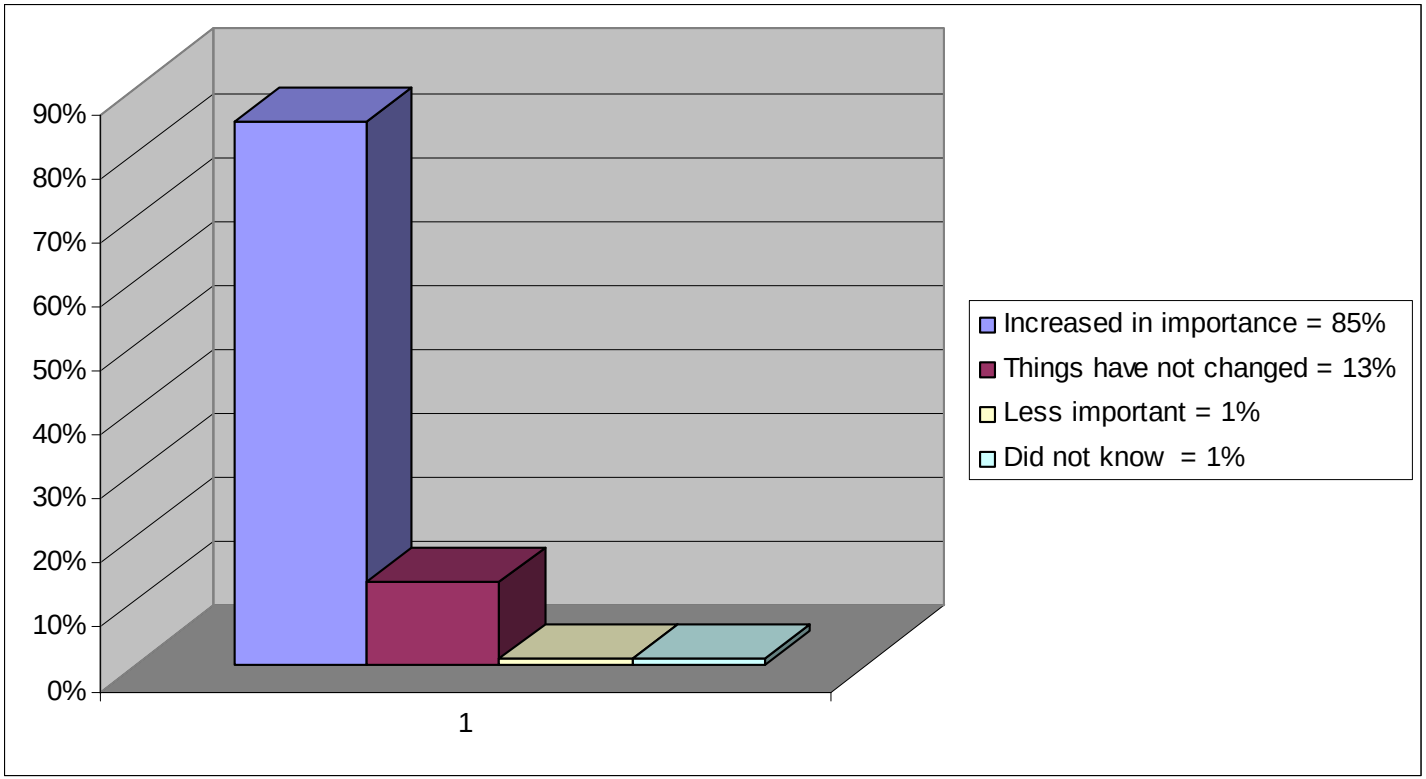
What comes to mind when you think about conservation or the environment in the City of Guelph?

- Water, water conservation or water restrictions were the most popular responses with 282 mentions
- Followed by waste management – 103 mentions, and energy efficiency/conservation with 51 mentions

Using a scale of 1-10, where 1 means "Not Important" and 10 means "Very Important", how important is water conservation to your household?



Compared to 5 years ago, do you think water conservation has become…..



The reasons most named for increased importance…

- Shortages, droughts, low water levels or a finite supply - 126 mentions
- Greater media awareness, attention or hype – 99 mentions
- Growth, development or sprawl – 62 mentions

Other information gathered includes:

- General demographic information
- Knowledge, participation and satisfaction in water efficiency programs offered by the City of Guelph
- Water use behaviour indoors and outdoors
- Willingness and desired/required incentives for implementing water saving mechanisms

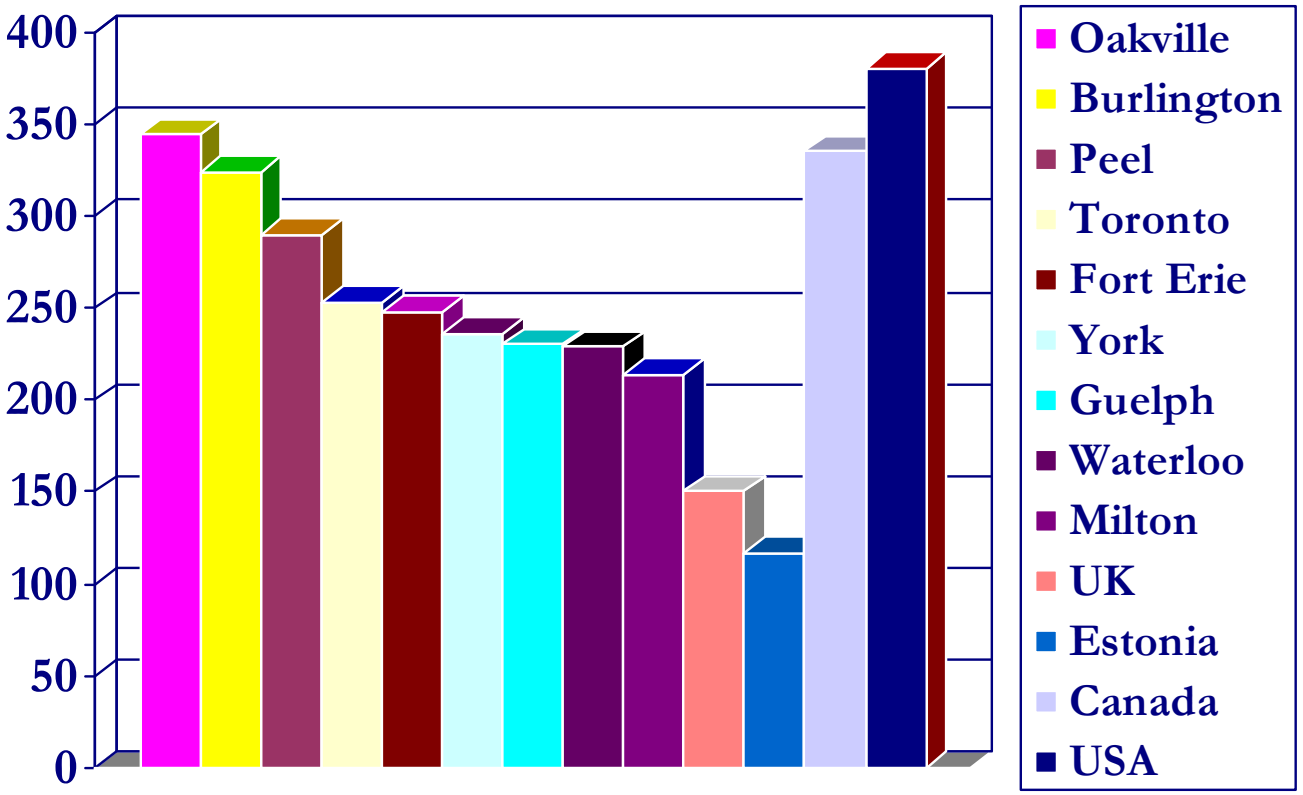
Water Use Demand Analysis

- Guelph Hydro Customer Billing Data (2001 to 2007)
- City of Guelph Housing Type Data
- Analysed 2007 in detail, 2001 to 2006 summary
- Segregated water use into:
  - Single Family Residential
  - Multi Family Residential
  - Industrial, Commercial, Institutional (ICI)

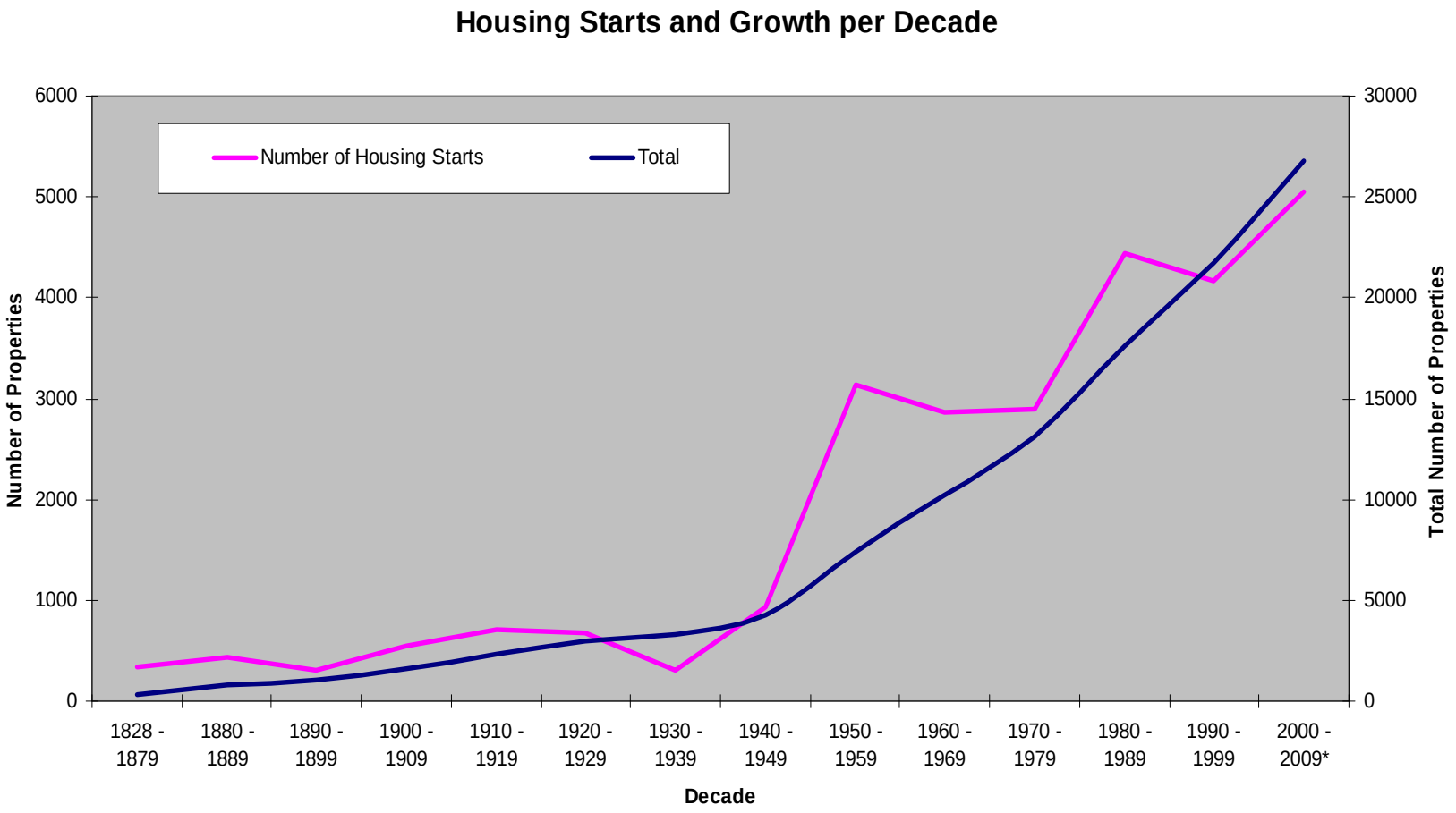
Water Use Demand Analysis Summary

Sector	2007 Billed(m^3)	% of Total Billed	Population	LCPD
Single Family	7,967,457	51%	94,745	230
Multi Family	1,135,560	7%	20,295	153
Total Residential	9,103,017			
Industrial, Commercial, Institutional (ICI)	6,660,534	42%		
Total 2007 Billed Consumption	15,763,551			

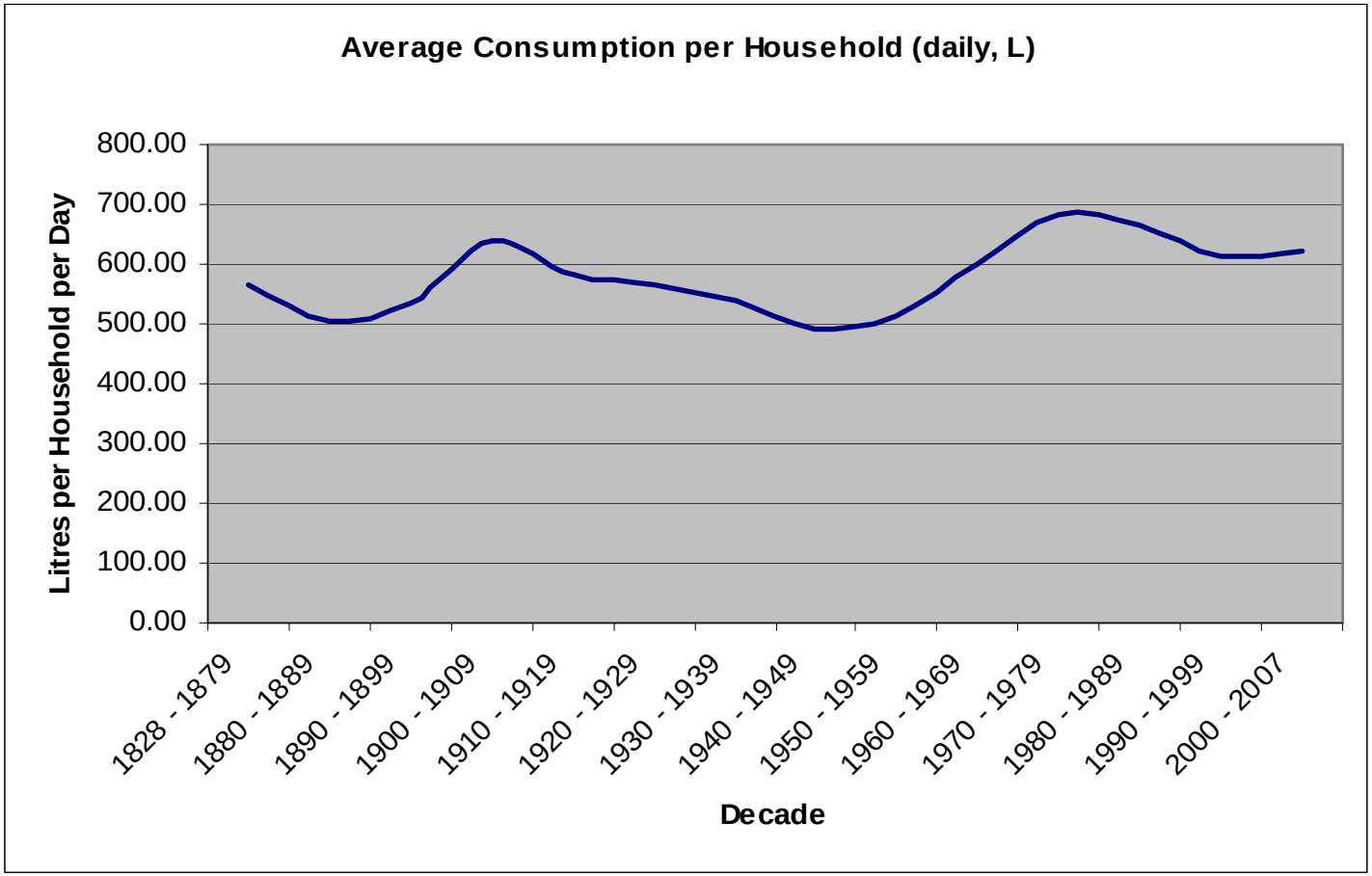
Residential Water Use Demand Analysis



Single Family Residential Analysis



Single Family Residential Analysis (2007)



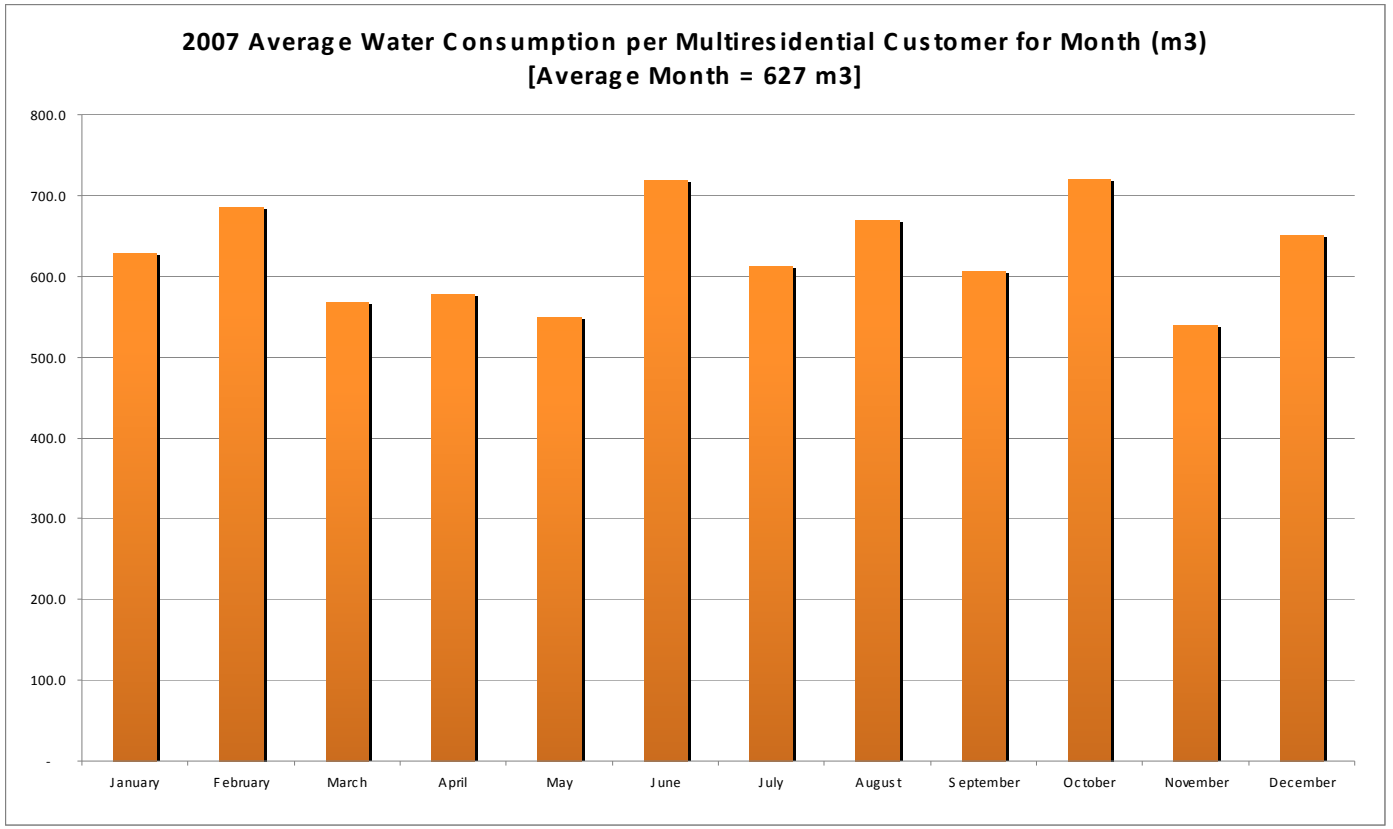
Single Family Residential Analysis

Period	Toilet Flush Volume	Number of Single Detached Properties	2007 Billed Volume (m^3)	Use Per Property Per Day (Litres)
Prior to Aug 1, 1993	No limits, so assume 20 litre	18,592	4,148,463	611
Aug 1, 1993 to Dec 31, 1995	13.25 litre	803	204,551	698
Jan 1, 1996 to Date	6.0 litre	5,899	1,270,640	590

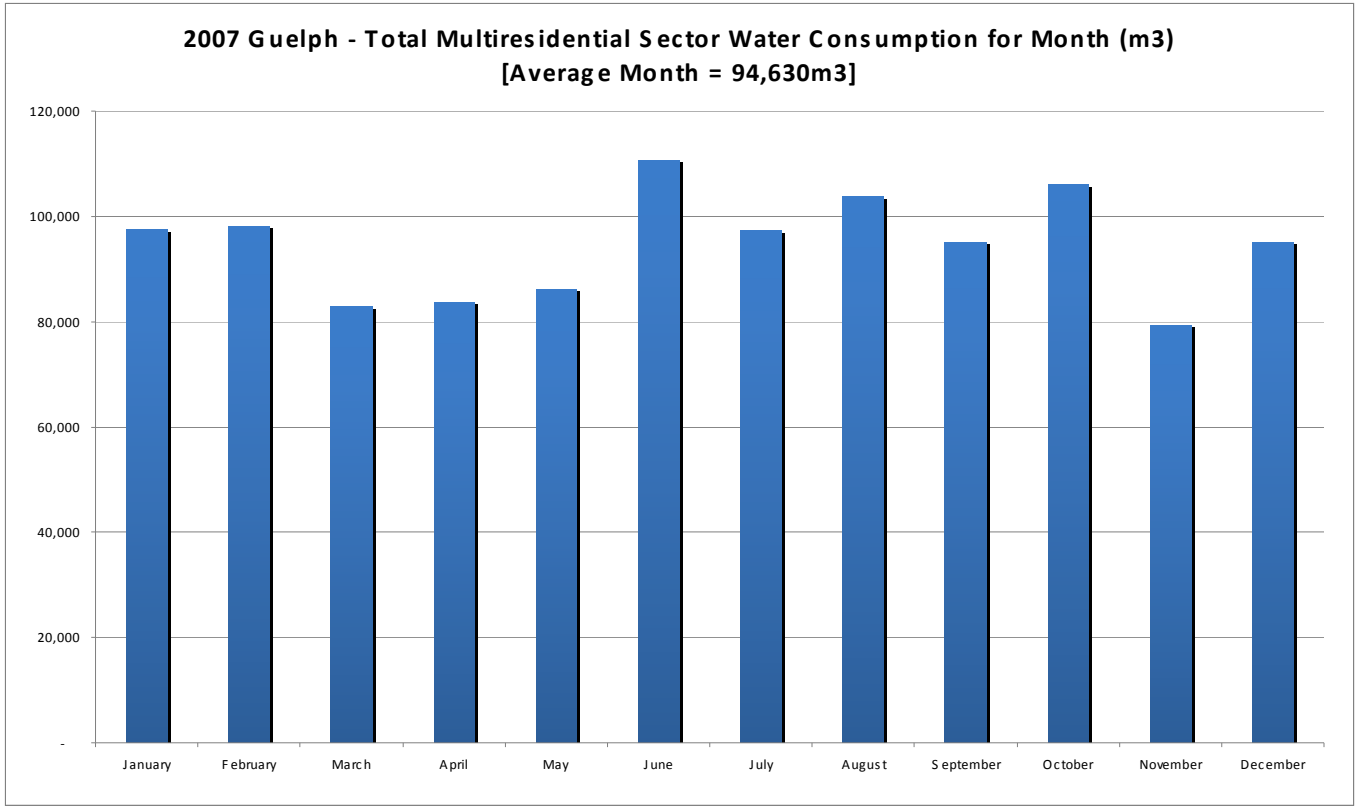
Multi Family Residential Analysis

	Number	Billed (m^3)
Average Customer Meter Reads	151	
Average Monthly Use Per Multi Res		627
Total 151 Multi Res Average Monthly Use		94,632
Yearly Total for 151 Multi Res		1,135,560

Multi Family Residential Analysis



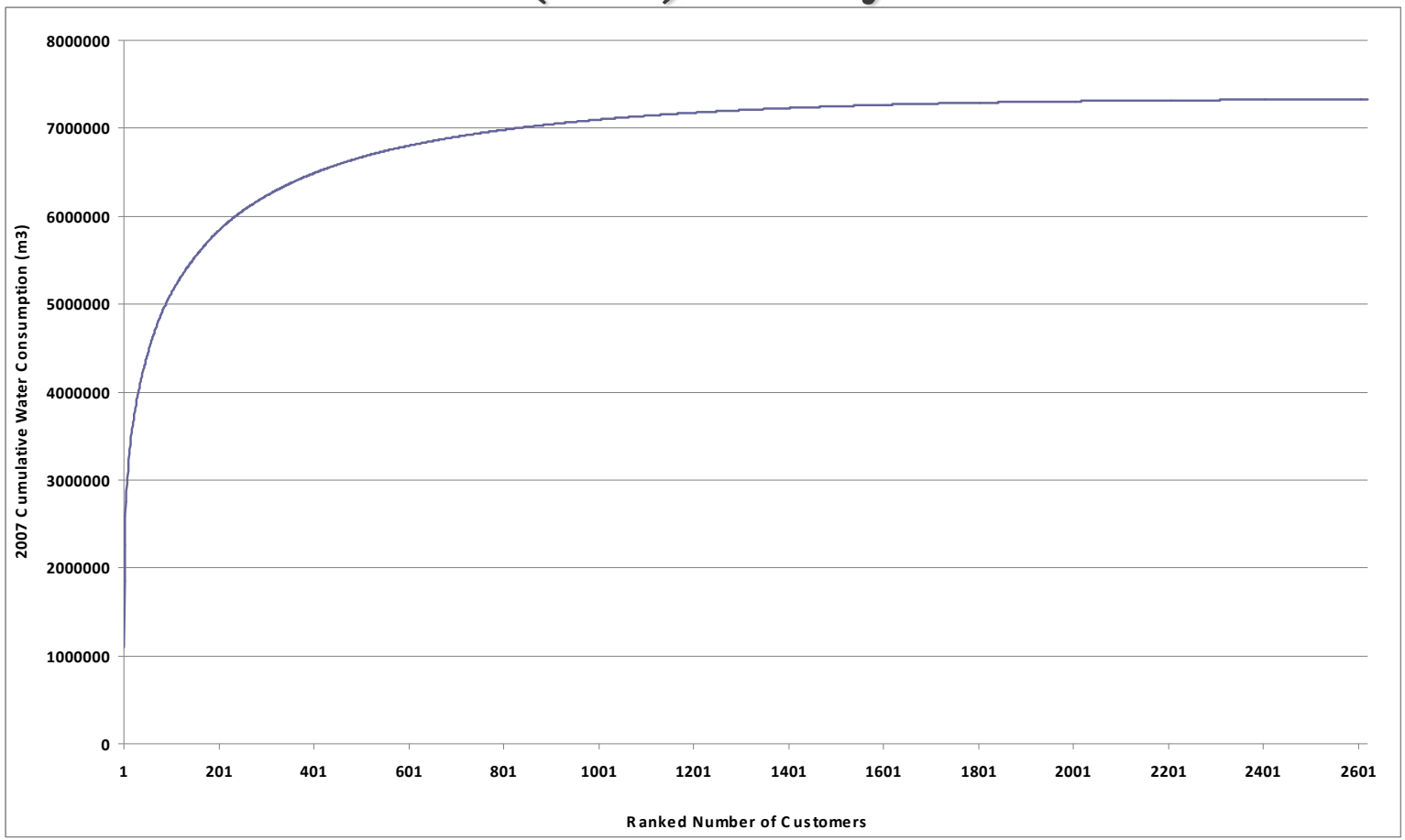
Multi Family Residential Analysis



Industrial, Commercial, Institutional (ICI) Analysis

- Based on previous experience 80:20 rule
- 80% water used by 20% ICI customers
- 204 customers (133 ICI, 71 Multi Res)
- Used North American Industry Classification System (NAICS)
- NAICS type of industry code and number of employees
- Developed spreadsheet to estimate domestic, process and product use

Industrial, Commercial, Institutional (ICI) Analysis



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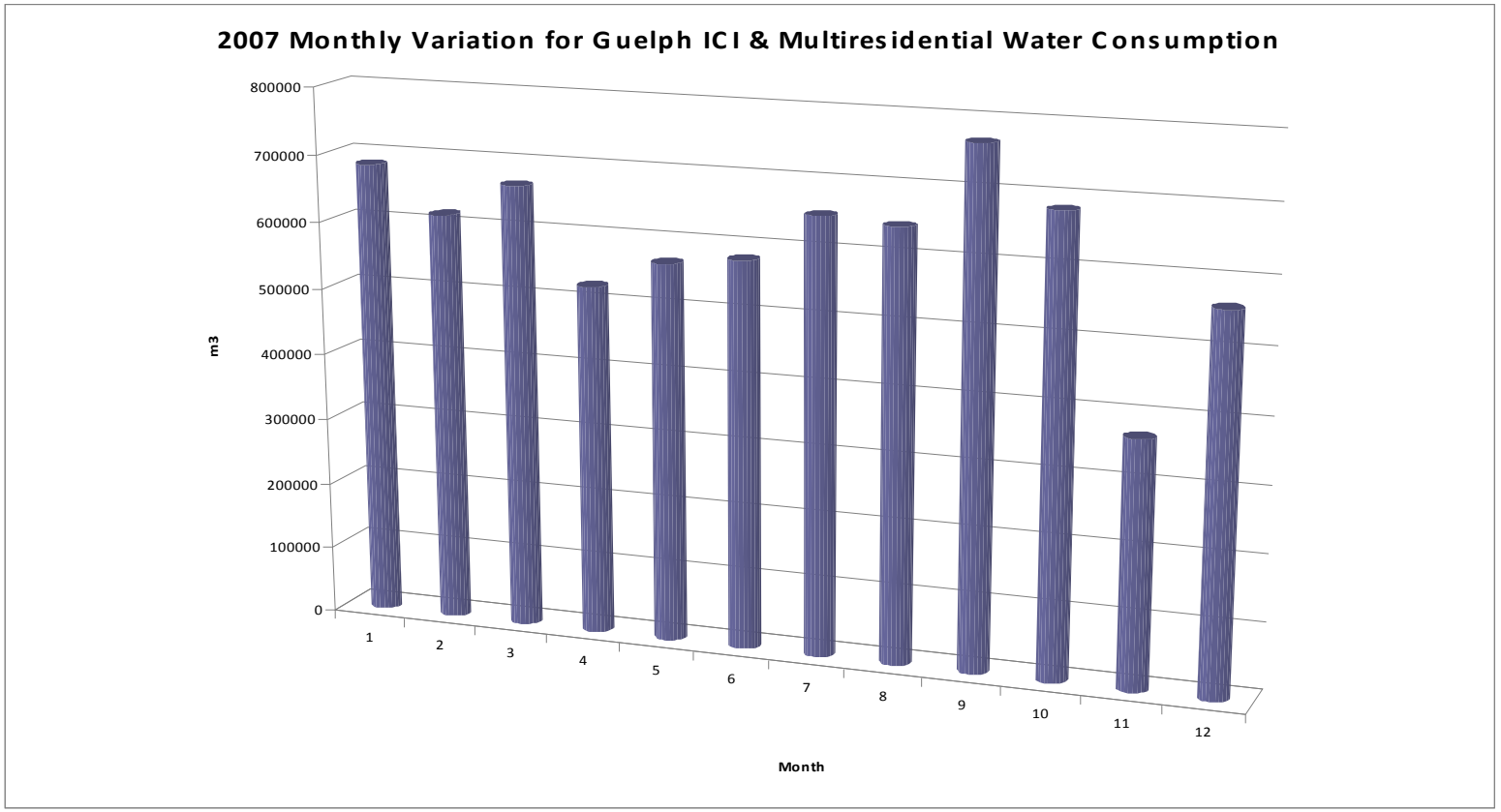
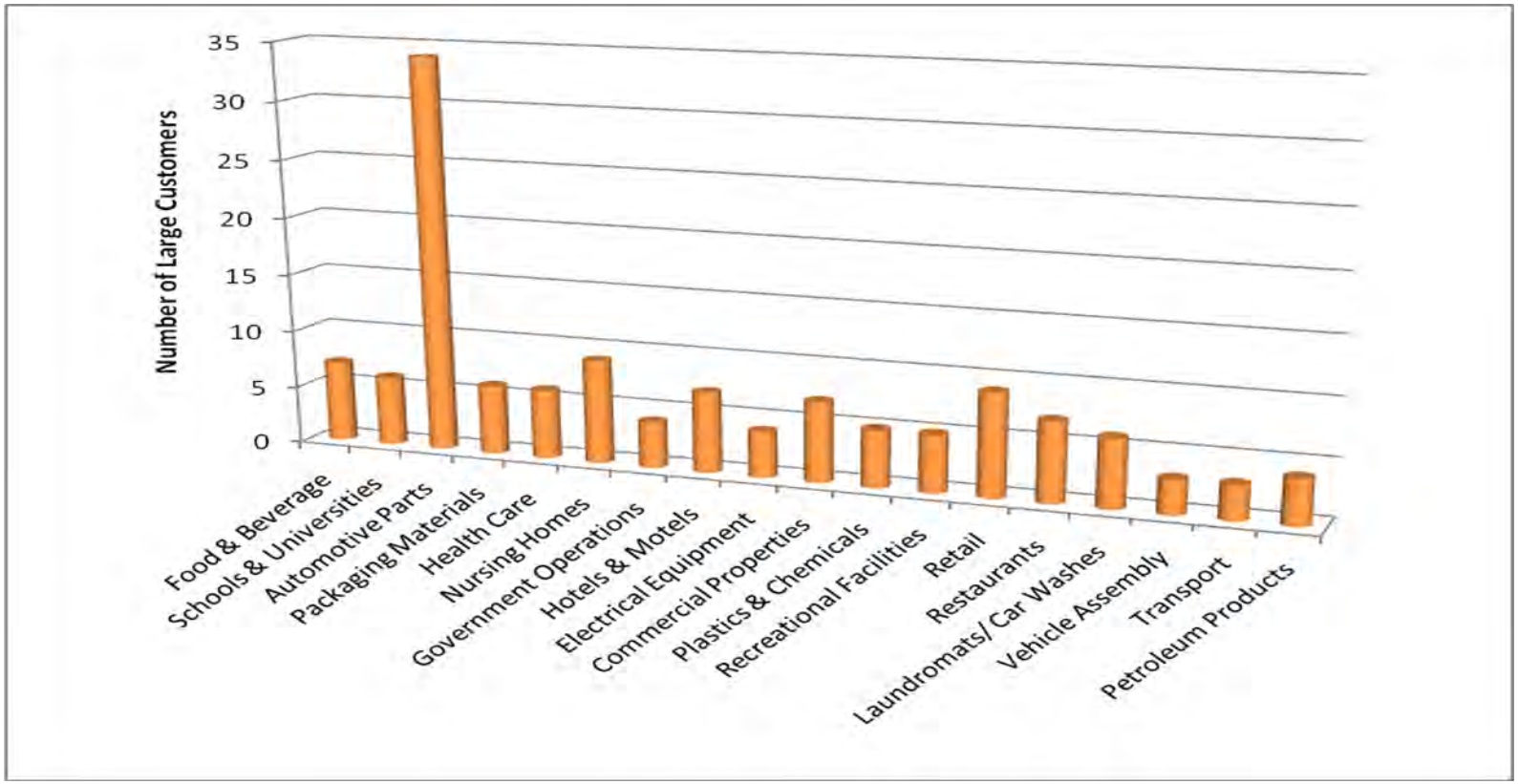


Industrial, Commercial, Institutional (ICI) Analysis



Industrial, Commercial, Institutional (ICI) Analysis

- Largest 133 ICI customers used 4,766,000 m^3 in 2007
- 29,000 people employed in these organizations
- Process water use estimate 4,198,000 m^3
- Domestic water use estimate 360,000 m^3
- Product water use estimate 208,000 m^3

Distribution System Water Loss

- Two sets of analysis:
  - International Water Association / American Water Works Association (IWA/AWWA) Water Audit and Water Balance
  - Water Loss Mitigation Strategy

AWWA / IWA Water Audit and Water Balance

- Focus on accounting for all revenue water, to identify non-revenue water
- Water loss to date referred to as "Unaccounted For Water (UFW)
- AWWA / IWA Audit – Best Management Practice (BMP)
- Part of new AWWA M36 Leak Detection Manual

AWWA / IWA Water Audit and Water Balance

<table>
<tr><td rowspan="4">System Input Volume</td><td rowspan="2">Authorized Consumption</td><td>Billed Authorized Consumption</td><td>Metered Consumption</td><td>Revenue Water</td></tr>
<tr><td>Unbilled Authorized Consumption</td><td>Unbilled Consumption</td><td rowspan="3">Non-Revenue Water</td></tr>
<tr><td rowspan="2">Water Loss</td><td rowspan="2">Apparent Losses</td><td>Unauthorized Consumption</td></tr>
<tr><td>Customer Metering Inaccuracies</td></tr>
<tr><td>Real Losses</td><td colspan="2">Leakage from Watermains and Service Pipes</td></tr>
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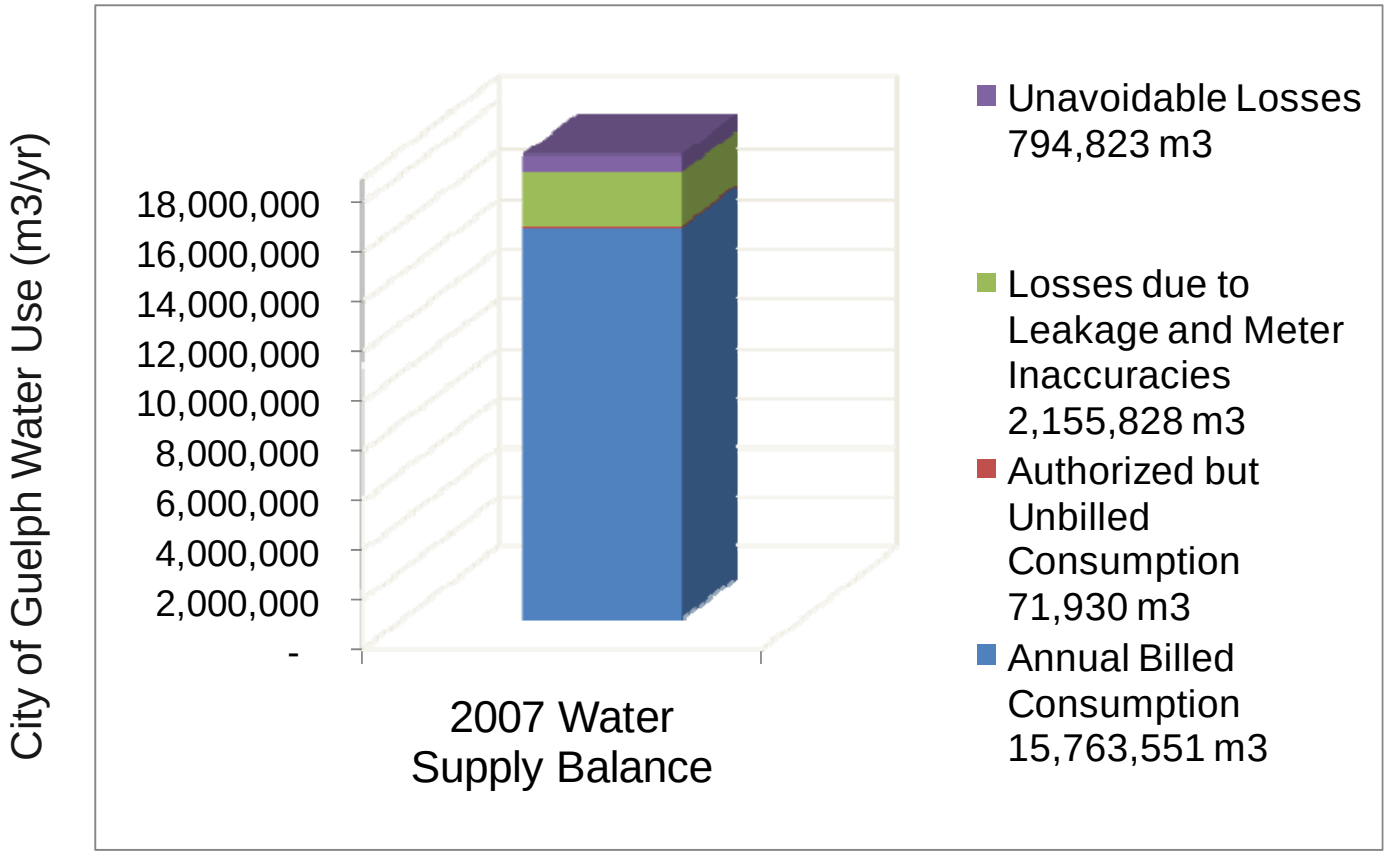
AWWA / IWA Water Audit and Water Balance



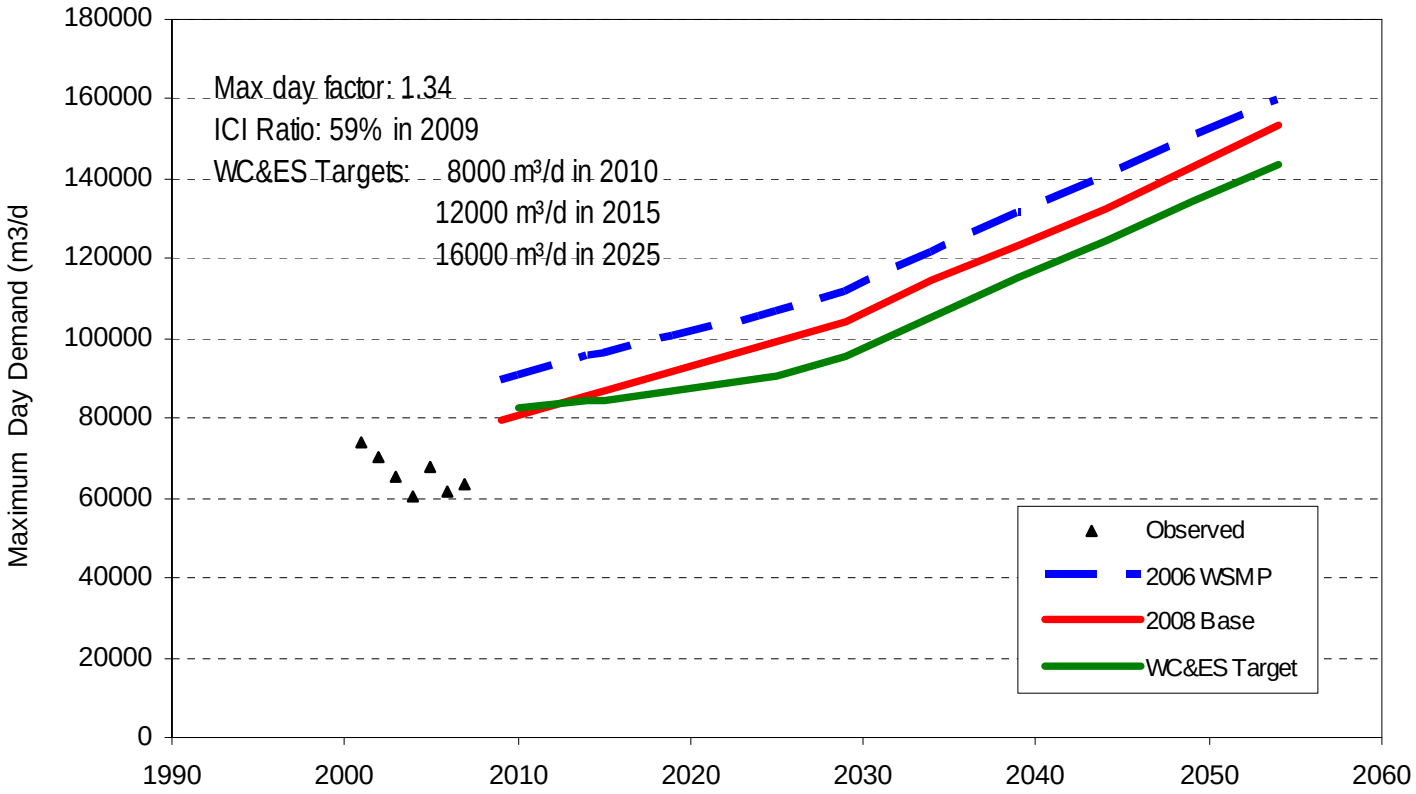
Water Loss Mitigation Strategy

- An in depth review of:
  - Water Source Meter Accuracy
  - Customer Water Meter Accuracy
  - Active Leak Detection Program

Water Supply Demand Forecast

- Demand forecasts from 1999 Water Conservation Study and 2006 Water Supply Master Plan
- Forecast Average Day, and Maximum Day demands
- Population growth projections, and used equivalent populations for ICI customers
- Average Day projections driven by population, Maximum Day by Peaking Factors

Water Supply Demand Forecast



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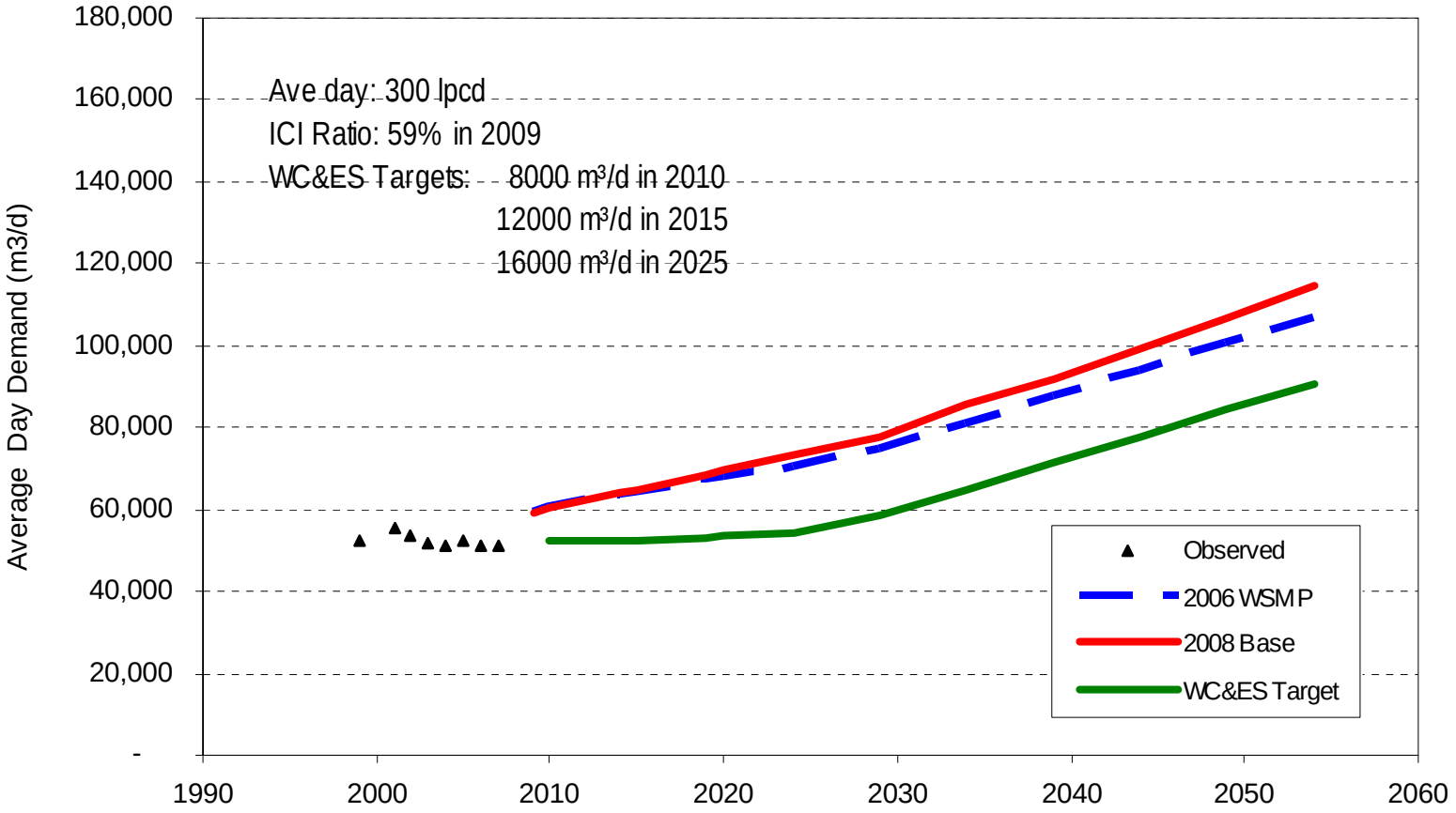
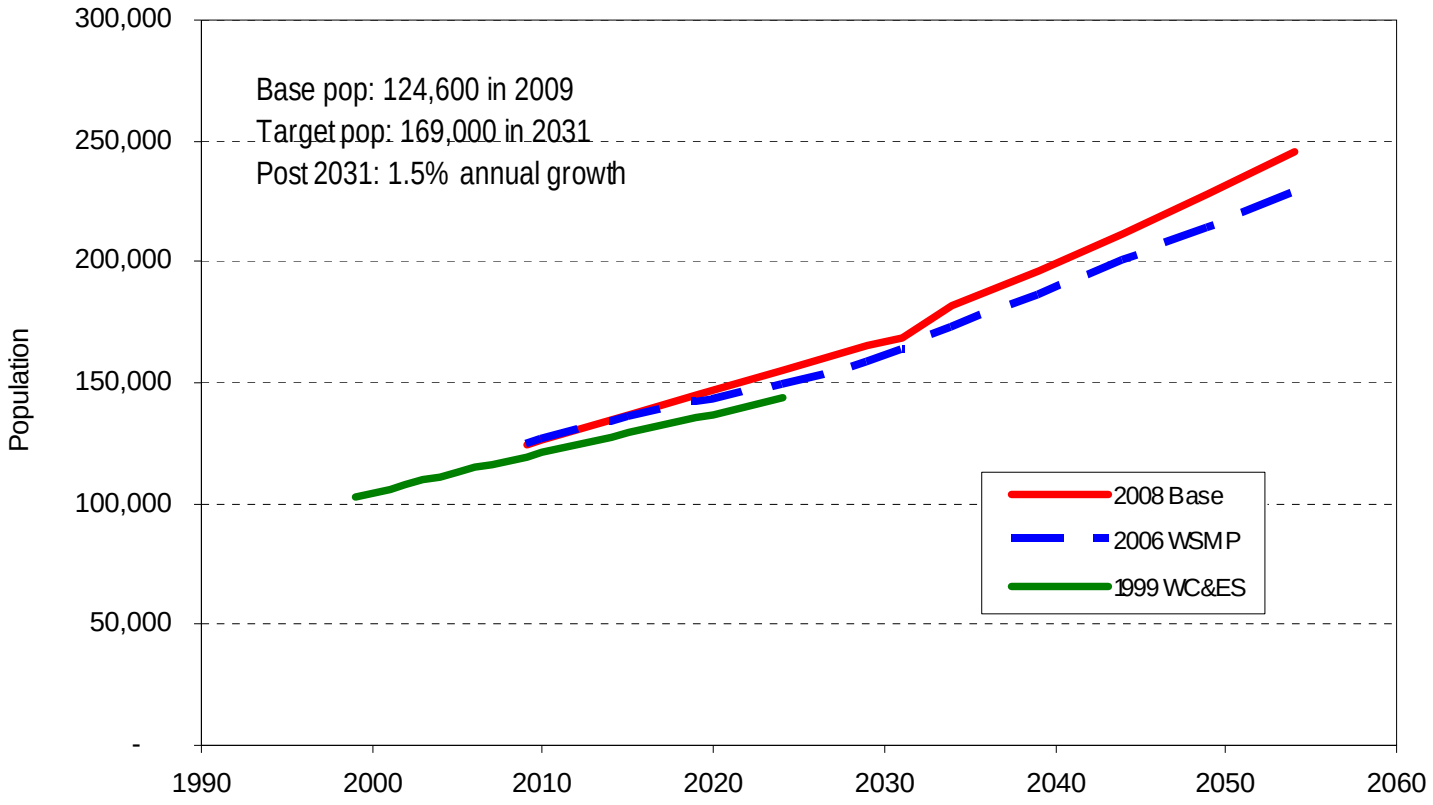
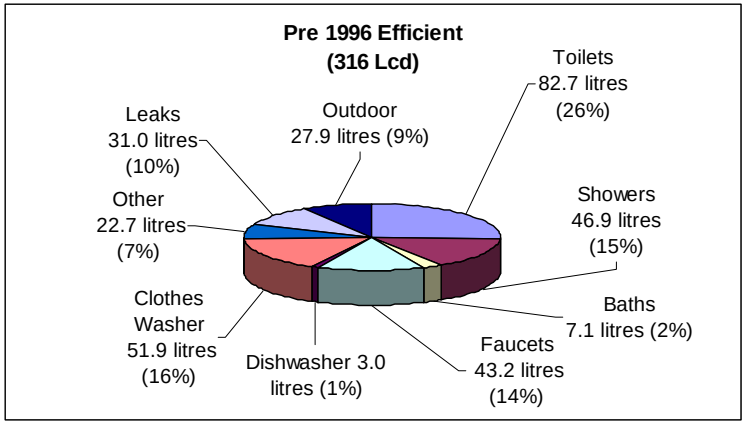
Water Supply Demand Forecast

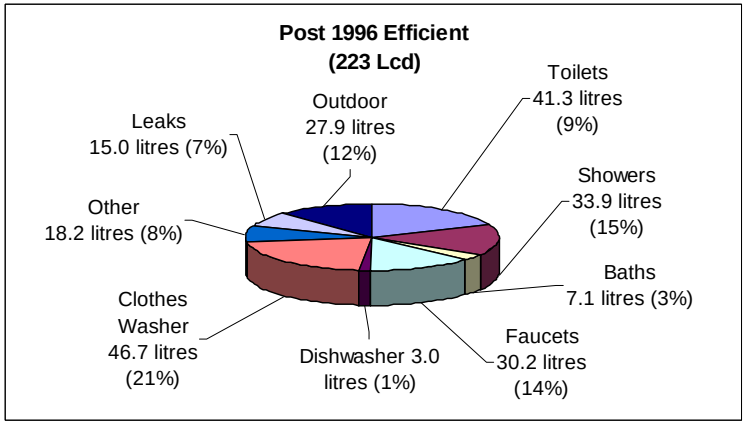


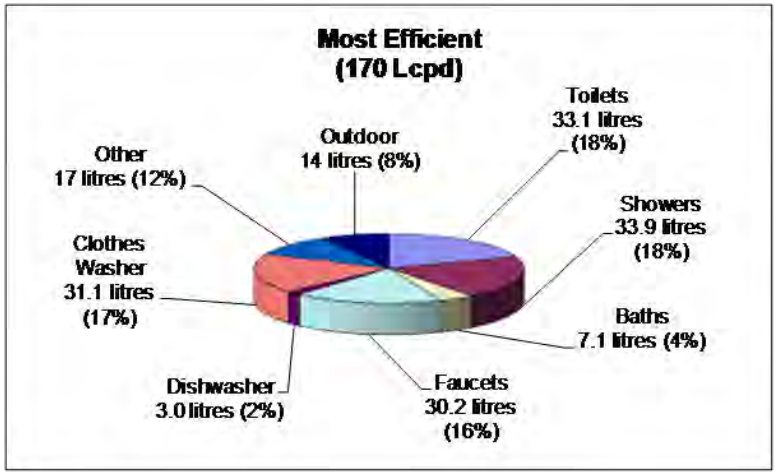
Water Supply Demand Forecast



Residential Water Use Demand Analysis







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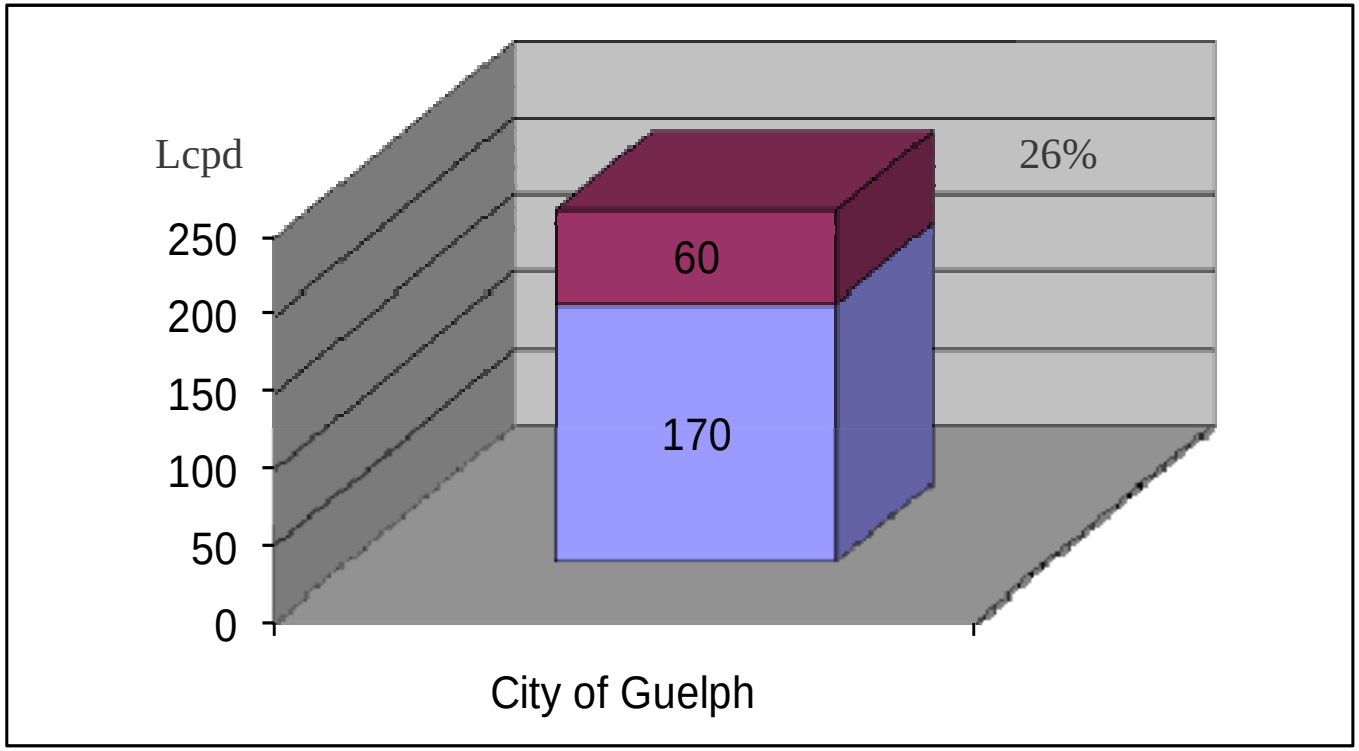
Residential Water Use Demand Analysis

Detached Single Family Residential Water Efficiency Potential



Overall Potential for Water Efficiency

Residential Single Family Detached	
Current Demand (2007) lcpd	230
Potential Demand (end use studies) lcpd	170
Potential Savings lcpd	60
2007 Population	94,745
Potential Single Family Savings	2,074,916 m3/year 5,685 m3/day

Industrial ,Commercial, and Institutional	
Current Demand (2007) m3	6,660,534
Estimated Savings 15% per Analysis	990,080
Potential ICI Savings	990,080 m3/year 2,737 m3/day

Distribution Leakage Reduction	
Active Leakage Reduction per Analysis	985,500 m3/year 2,700 m3/day
Background Leakage Reduction Per Analysis	109,500 m3/year 300 m3/day
Total Potential Leakage Savings	1,095,000 m3/year 3,000 m3/day

Residential Multi-family	
Current Demand (2007) lcpd	153
Estimated Savings 22% per Analysis	34
2007 Population	20,295
Potential Multi-family Savings	249,342 m3/year 683.1 m3/day

Total Potential Water Efficiency Savings	
Potential Single Family Savings	2,074,916 m3/year 5,685 m3/day
Potential Multi-family Savings	249,342 m3/year 683.1 m3/day
Potential ICI Savings	990,080 m3/year 2,737 m3/day
Total Potential Water Efficiency Savings	3,323,338 m3/year 9,105 m3/day
Total Potential Water Efficiency and Leakage Savings	**4,418,338 m3/year 12,105 m3/day**
Percentage Saving of 2007 Actual Demand	28% m3/year 28% m3/day

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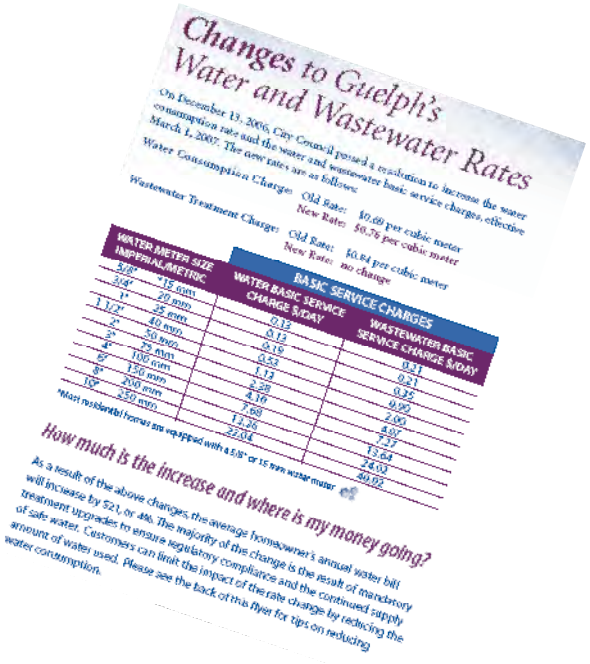
Popular Water Efficiency Measures

- Customer water meters
- Codes and regulations
- Conservation type water rates



Changes to Guelph's Water and Wastewater Rates

On December 13, 2006, City Council passed a resolution to increase the water consumption rate and the water and wastewater basic service charges, effective March 1, 2007. The new rates are as follows:

Water Consumption Charge: Old Rate: $0.68 per cubic meter
New Rate: $0.76 per cubic meter

Wastewater Treatment Charge: Old Rate: $0.84 per cubic meter
New Rate: no change

WATER METER SIZE IMPERIAL/METRIC	BASIC SERVICE CHARGES WATER BASIC SERVICE CHARGE $/DAY	WASTEWATER BASIC SERVICE CHARGE $/DAY
5/8" 15 mm	0.12	0.21
3/4" 15 mm	0.13	0.21
1" 20 mm	0.16	0.25
1 1/2" 25 mm	0.32	0.50
2" 40 mm	1.13	0.90
3" 50 mm	2.28	2.00
4" 75 mm	4.16	4.37
6" 100 mm	7.68	7.77
8" 150 mm	13.26	13.64
10" 200 mm	22.04	24.03
250 mm		40.03

*Most residential homes are equipped with a 5/8" or 15 mm water meter

How much is the increase and where is my money going?

As a result of the above changes, the average homeowner's annual water bill will increase by $21, or 4%. The majority of the change is the result of mandatory treatment upgrades to ensure regulatory compliance and the continued supply of safe water. Customers can limit the impact of the rate change by reducing the amount of water used. Please see the back of this flyer for tips on reducing water consumption.

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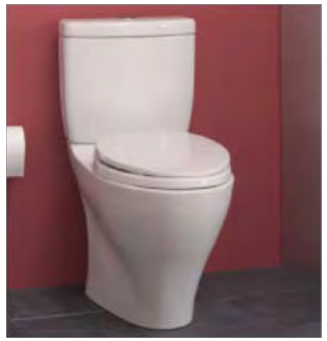
Popular Water Efficiency Measures



Residential Indoor - Rebates

- Ultra low flush toilets – 6 litres
- High efficiency toilets – 4.8 litres
- Dual flush toilets – 3/6 litres
- Water efficient clotheswashers
- Water efficient dishwashers
- Water efficient water softeners
- Water efficient humidifiers

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Popular Water Efficiency Measures

Residential Indoor - Install

- Toilet displacement devices
- Toilet early closing devices
- Toilet syphon break devices
- Dual flush toilet retrofit devices
- Low flow showerheads
- Kitchen and bathroom faucet aerators

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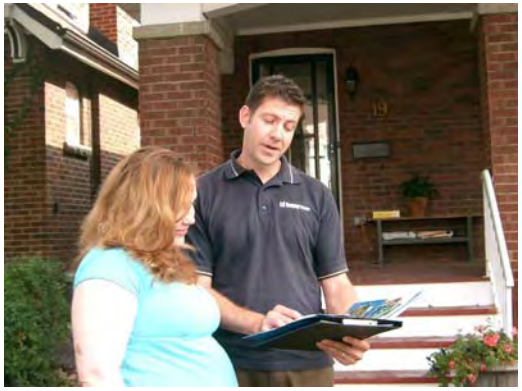
Popular Water Efficiency Measures

Residential Outdoor

- Water Efficient Landscape Visits
- Rebates for Irrigation controllers
- Rain barrels
- Water Use Restrictions and Outdoor Water Use Program



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Popular Water Efficiency Measures

Industrial, Commercial and Institutional

- Comprehensive process based water audit
- Water efficiency retrofits and upgrades
- Incentive based program commonly called Capacity Buy-back

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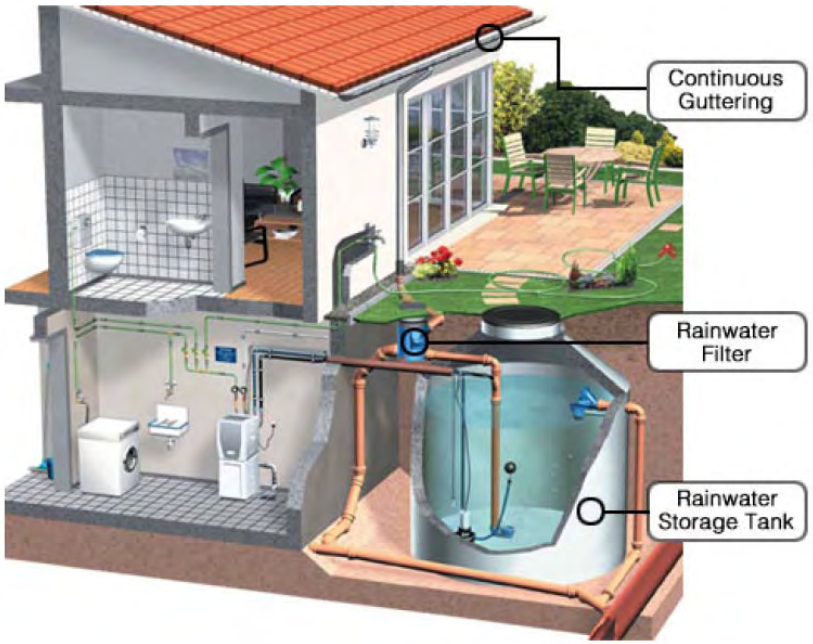
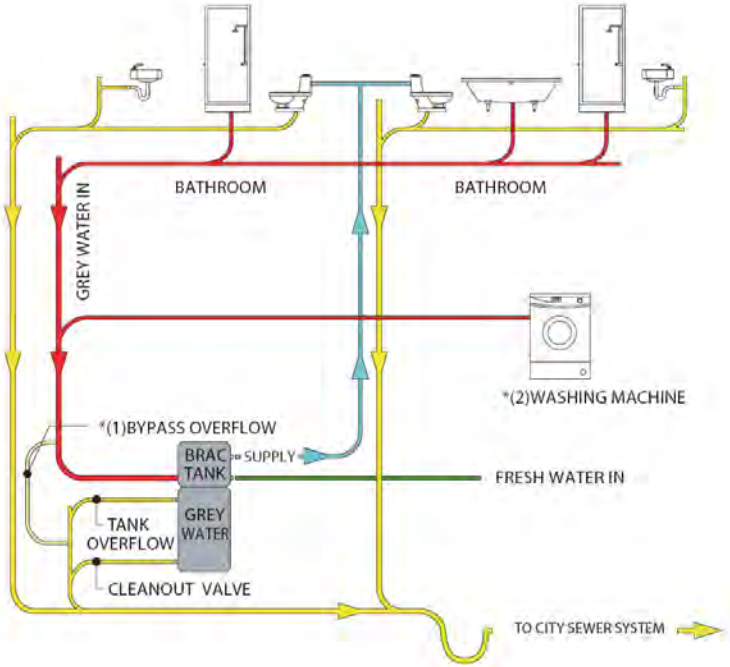
Popular Water Efficiency Measures

Emerging or "Re" – Emerging Technologies

- Grey water re-use
- Rain water harvesting





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Popular Water Efficiency Measures

Broadscale Education

Homeowner's Landscape Visit Package, 1,000 home visits completed per season

- Water bill inserts and bulletins
- Literature
- Public displays and speaking engagements
- Website

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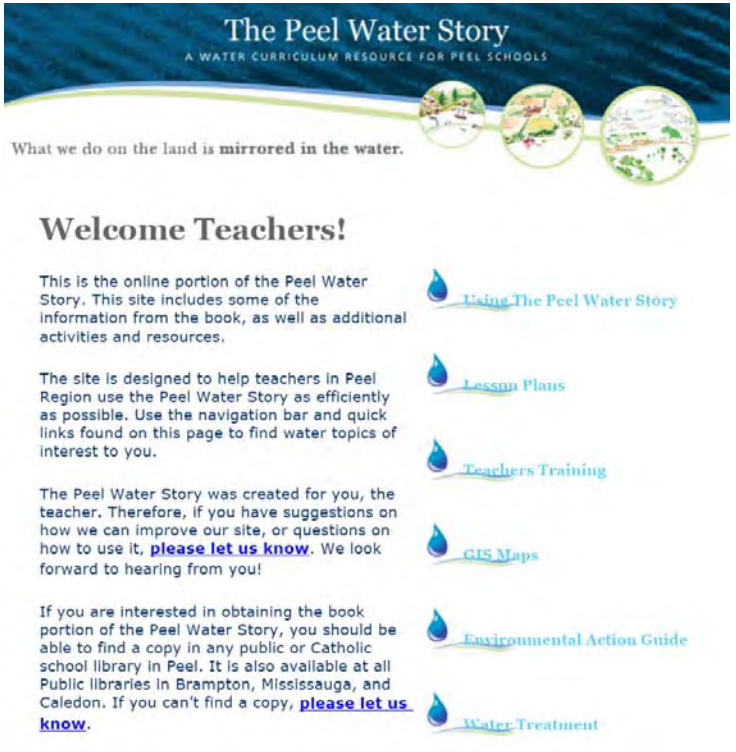
Popular Water Efficiency Measures

Youth Education

- In school programs



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Popular Water Efficiency Measures

Youth Education

- Children's Water Festivals

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Moving Forward and Next Steps

Strategy Development

- Screening of water saving measures
- Short list of water saving measures
- Determine achievable water savings
- Determine costs of water saving measures
- Develop delivery strategy
- Develop monitoring and evaluation strategy
- Develop maintenance plan
- Develop short term and long term plan

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Moving Forward and Next Steps

Public Consultation

- Public Advisory Committee Meeting in September
- 2nd Public Information Centre (PIC) in October

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City of Guelph

Water Conservation and Efficiency Strategy Update

Public Information Centre #1

August 27th 2008

Minutes

Discussion Period

Break out session questions

From the options this evening, what are your thoughts?

M: How are you feeling right now about all this, what are your thoughts about moving forward?

Couple things that struck me – comparison always between Europe and NA, mention meters really great and really good, and then say in spite of that – in England you say that they don't make a difference.

Two: Trying to catch children in school and bring into their minds – seems to me the really critical thing is north American belief that we have to change – so biggest challenge may be changing the way that North Americans perceive things like water, energy and all of that.

MB: metering is interesting. We would all say (in industry) that all should be metered because it is a valuable management tool. To not know exactly how much is being sold – we would not be able to do most of these analysis as here in the UK because of this.

In terms of retrofitting homes, I know more intensification in down town growth, more intensify one home – more water in that home – a few more units – will there be some program where retrofits/retrofitting can take place? And where is the money going to come from? Because demand will increase – where is that going to come from?

MB: Would you like to see retrofitting downtown?

Q: Right across province

MB: At what cost – great question

Q: Solution might be to remove GST/PST on these materials/appliances.

MB: Good point, doing that now on energy products, why not water?

Q: I'm thinking about moving into condo, leaving single family home – understand that they don't meter entire buildings, so what is incentive? Would like to see metering on every unit – also, school programs – I thought present education system was discouraging talking to young people because they got too depressed about it. What success are you having getting it back in?

MB: Let me answer this – what we have found is that, although focus/theme is water efficiency and water conservation, what you need is other elements for the teacher. Eg. In York, water based program with curriculum that covers math, geog, history, science art and language. All meet Ontario curriculum requirements.

MB: Metering of condos?

Q: Trend in newer condos is that they are metered individually. Older tend to be one meter. Anything in last five years has separate meters.

MB: I imagine hard to retrofit older?

Q: Almost impossible. Additional cost comes from the install and the reconfiguration.

MB: If we had all the political will and the money that would be a good measure.

Team: A function of how accessible the information is – children's groundwater festival is a great vehicle. As long as there are a lot of really creative ways, children really pick up that information. Very realistic setting that it is delivered in, and teachers really appreciate that there are alternative ways to reach expectations.

Q: When children grow up, must be conscientious. Teaching the youngest is very importance. Also, hydro bills paid by the users is important. Incentives go to (lower) users, it would be more effective. Seems like more practical to reward people.

Q: Is your committee or group aware that being efficient in saving water and energy are combined. Can't separate. My argument is that there is much hoo ha about low flush toilet. Because those using zero water to flush water have to subsidize those getting the benefits. If you have to order 500 new low flush toilets, think about the amount of energy used to actually make those toilets. Not getting ahead.

MB: I can say we are aware that water utilities are typically largest consumers of energy. So that when a city is having a smog day, or peaking day, on electricity, typically it is a peaking day for water. We know that for every cubic meter of water we can reduce, we can reduce one kilowatt hour of energy. So yes we are aware of connection.

Q: Was going to suggest that educational component with groundwater festival, now an incentive to add a new trick or new tool would be a geo-cash approach where they become more aware of their larger community to collect their own information and develop that skill to automatically link globally and expand their awareness. That's just kind of a tool to help engage people. Two , one thing I really

appreciated was that since 1999 and some odd 3,000 pages of work – in 1999 it was cited that one of the largest areas of weakness was that all systems infrastructure was incredibly weak. And it was just an indication that we have not consistently looked at refurbishing our system. To me its hard to see real deliverables, and I saw that coming up tonight and I saw that our forecaster was recognizing risk mitigation and loss strategies. We have technologies and tools in this day and age that can help. Concern was that with some charts I saw tonight was that they were all forecasts but I would like to see those forecasts against the actuals.

MB: Unfortunately those actuals can only be from the past.

Q: Its still good to see what we've done on old information. It should force us to update our technology to have more updated data.

MB: A lot of your points were reflected in our PAC meeting. And a counsellor echoed your concerns.

MB: What level of subsidies for individual measures do you think would be appropriate?

Q: Who is going to monitor the system quality? I'd like to tell people to do really simple things. Need to change attitude of people to do really simple things.

Q: PAC member. subsidies, I find it hard to answer without saying – compare to spending money on what? Is social marketing better than subsidies.

MB: So you would favour cost-effective first?

Q: So look at subsidized rain barrels, does anyone purchase rain barrels that are not subsidized? For me the royal flush program, I won't take advantage because its not that much money to save – I guess I'm not into the heavy subsidies. I think it really is the mobilization around it. It has to be value based.

Q: I'm thinking that there is still a segment of the population whose only way to reach them is with the dollar so if you want a large segment to buy in, you have to pay for it.

Q: About toilet rebate program – it's a valid point, and another woman mentioned earlier that she had made switch before the programs. So what I would say to Mr Willis is that as the municipality grows one of easiest ways to save water is within existing program. Either way you would also be paying for other services. We are all doing the same through taxes.

MB: A small community just on groundwater had a dramatic water issue. And they had to act fast, and a new plant or wells would have been too lengthy and labourous. Easiest way was low flush toilets and through that they essentially built a new treatment plant.

Q: We also were ahead of the rebates. DF toilets before increased. Front loading before you even thought of. I'm frustrated because there are six things you've done. I'd like to talk about other things

that are more. Number 1, grey water recycling and fixing leaks = number one. I think subsidy for front loading washers just is not enough.

MB: Would you subsidize grey water if you were mayor?

Q: I don't know technology or expenses, but at least it should be going into new housing.

Q: For some people these are moral decisions. But you can embed some of those standards by limiting alternatives (low flush toilets, etc). Morally, all of the ideas are great. For commercial, far fewer number to convince, and it's the bottom line for them, so likely easier to show how to cut down and save more water with fewer conversations with them. Other, it's a challenge but you have to drag out all of your change management skills. The man from the city linked it to – in the future we will need more water – I think it would be good to hear that. [ahead] … if were running out of water and a pipeline, we need both subsidies and messaging.

MB: 100 million for a pipeline, how much will you pay for water efficiency to supply the same amount of water. So if I was to say YOU ARE RUNNING OUT.

Q: I would say to pay the same or more for water efficiency.

Q: 4-5 years ago, city water running 78 pounds pressure through the mains. What happens if you cut it down to 40 psi. How much money will you save? Just put regulators in every house, cut them down to 40 psi. How much will that cost?

KB: we are looking at pressure reduction – we are bringing that to the forefront again.

Q: I want to know more, if a regulator in a house, drop pressure, whats the payback?

Q: You cut pressure to 40, now you don't have to pump as hard. Not leaking as fast, less pressure on mains. 40 psi is a fair bit too. You don't need that tap to blast out.

Q: City operates between 40 and 100 psi using a three tank system. To get it down to 40 everywhere would require prv in houses but also require the city to segment how they distribute water, may be infrastructure cost. Areas that barely get 40 and areas that get 100. So it would require infrastructure costs.

Q: Right now system is not balanced.

MB: We will be here longer to answer questions. Please ask after the closing slides.

WATER CONSERVATION AND EFFICIENCY STRATEGY UPDATE

Public Information Centre

Thursday, November 20th 2008

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Consultant Project Team

Understanding the Assignment

Develop a comprehensive community-based Water Conservation and Efficiency Strategy Update that will define preferred program alternatives, associated water savings, program implementation forecasts, and support staff and maintenance based on resources required to meet the water reduction goals identified in the Guelph Water Supply Master Plan within a 20 year planning horizon.

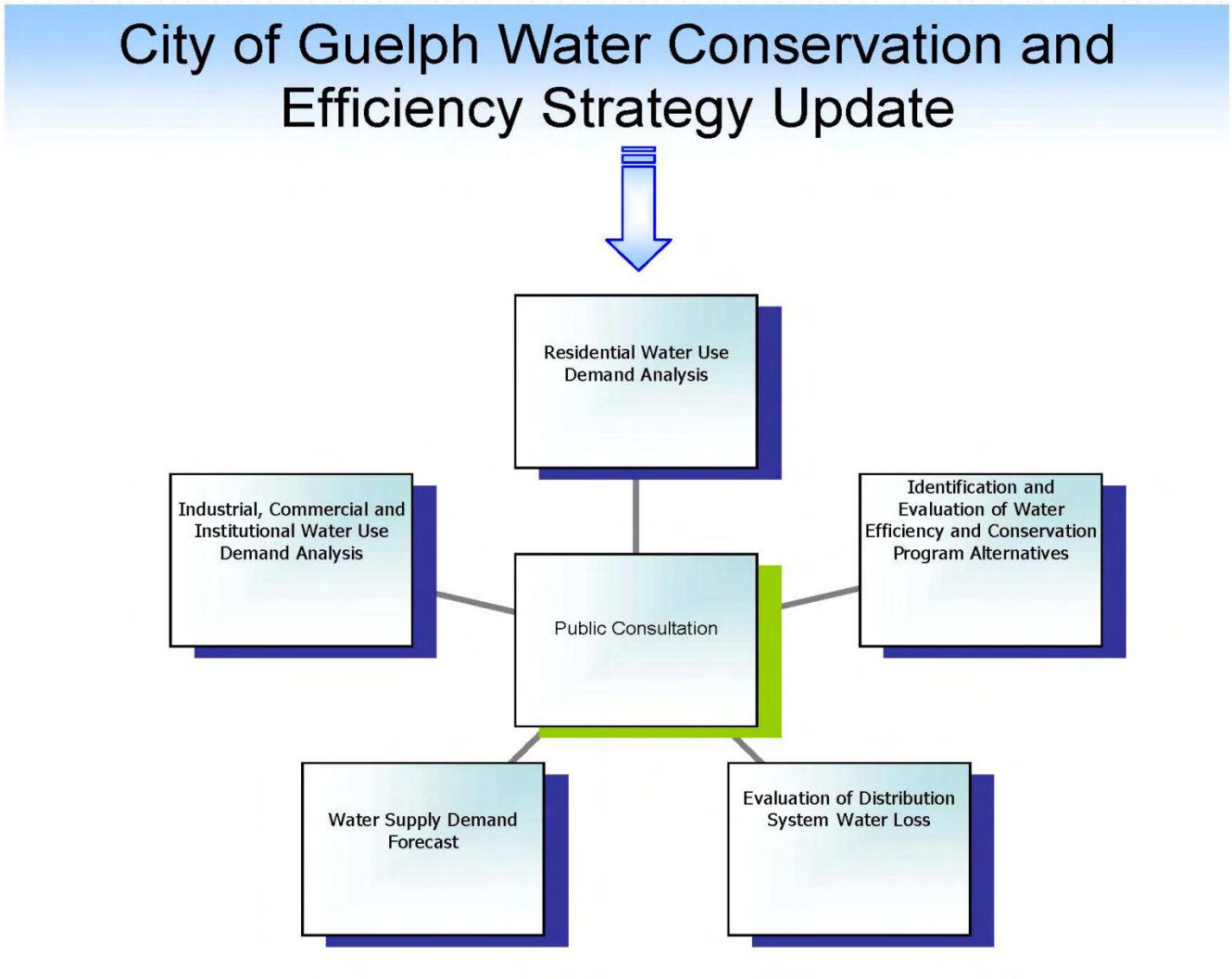
Critical Factors:

- Finite groundwater source
- Projected future growth
- Assimilate capacity thresholds of Speed River for wastewater discharges

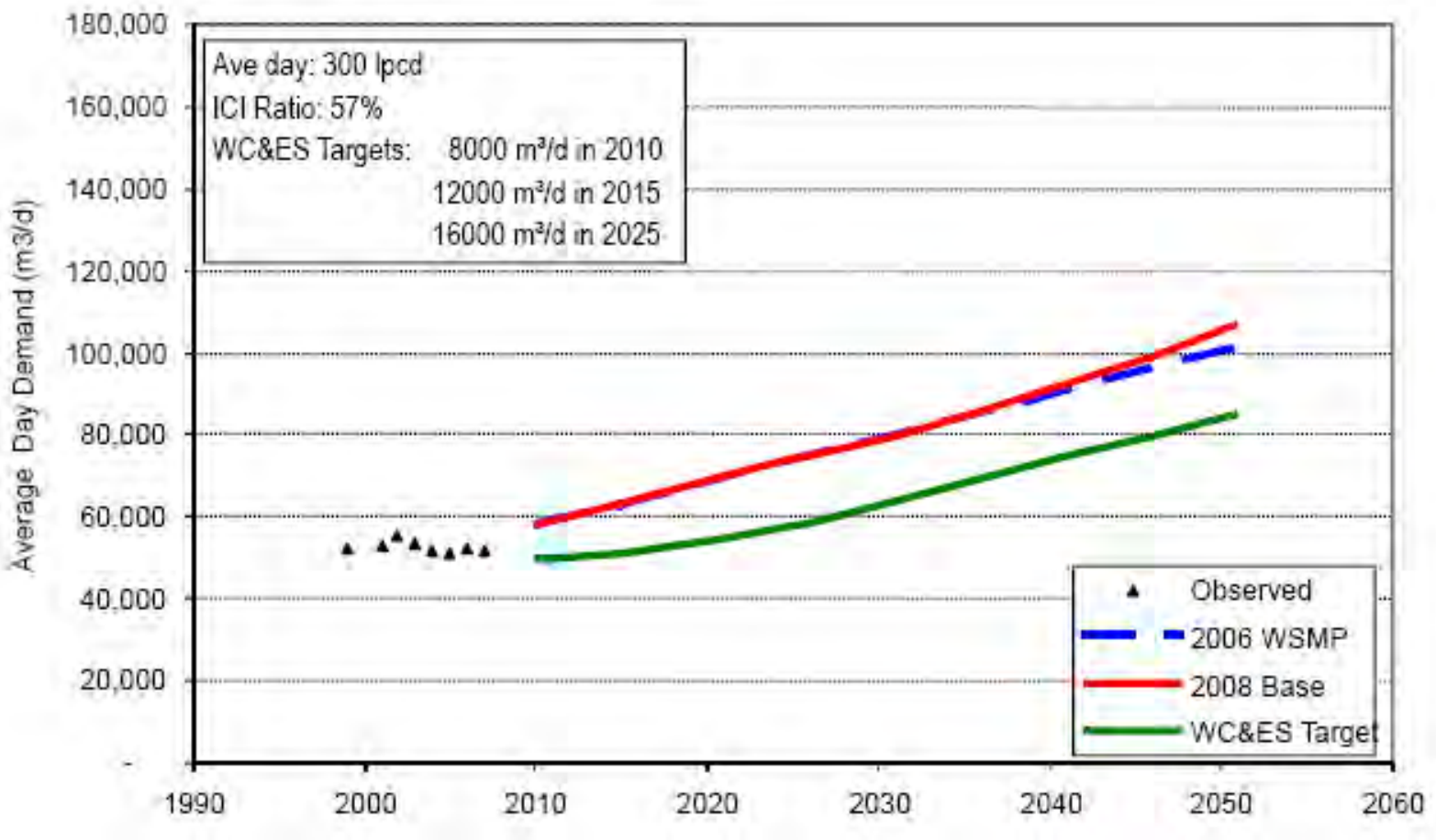
City of Guelph Water Conservation and Efficiency Targets:

- Leader in conservation and resource protection/enhancement
- Use less energy and water per capita than any comparable Canadian City
- Average Day Water Use Reduction of 10% by 2010, 15% by 2015 and 20% by 2025

...Water Conservation and Efficiency Strategy ...



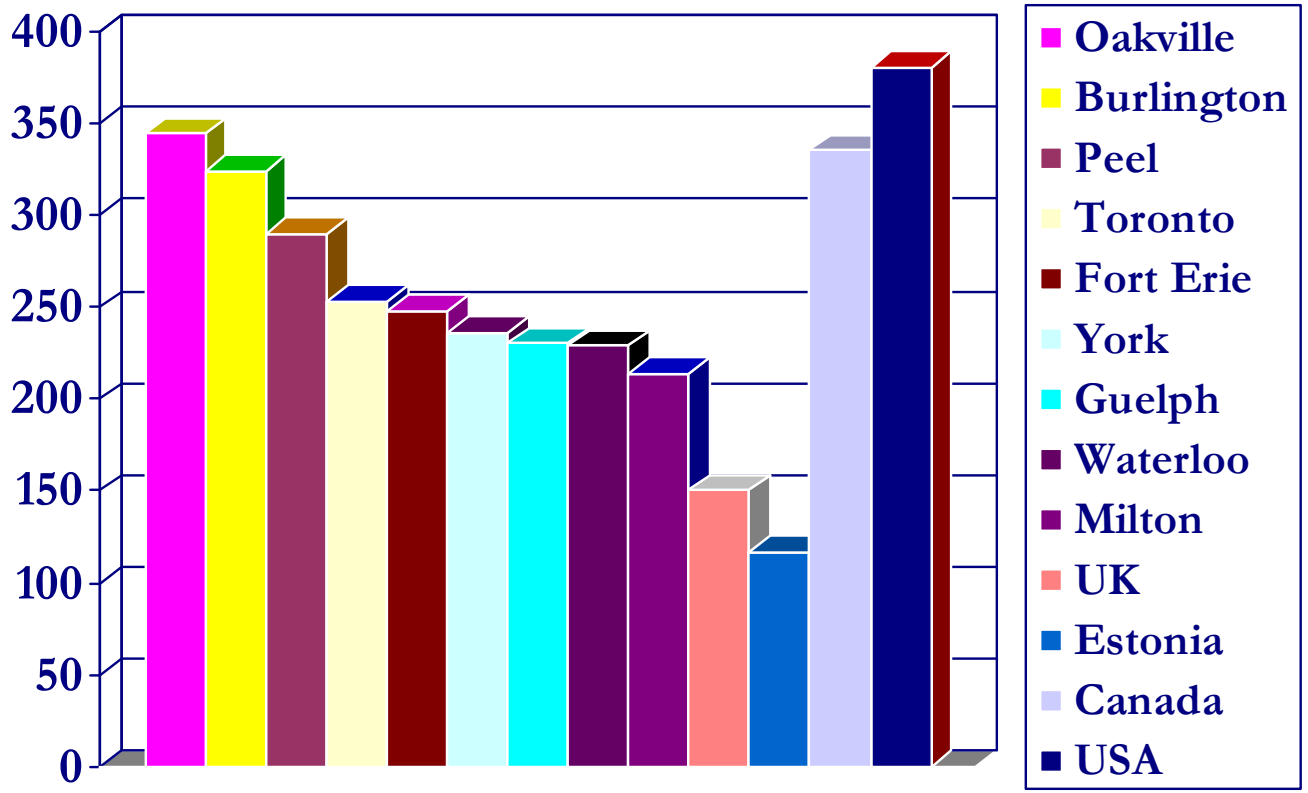
Average Day Demand



Water Use Demand Analysis Summary

Sector	2007 Billed(m^3)	% of Total Billed	Population	LCPD
Single Family	7,967,457	51%	94,745	230
Multi Family	1,135,560	7%	20,295	153
Total Residential	9,103,017			
Industrial, Commercial, Institutional (ICI)	6,660,534	42%		
Total 2007 Billed Consumption	15,763,551			

Residential Water Use Demand Analysis



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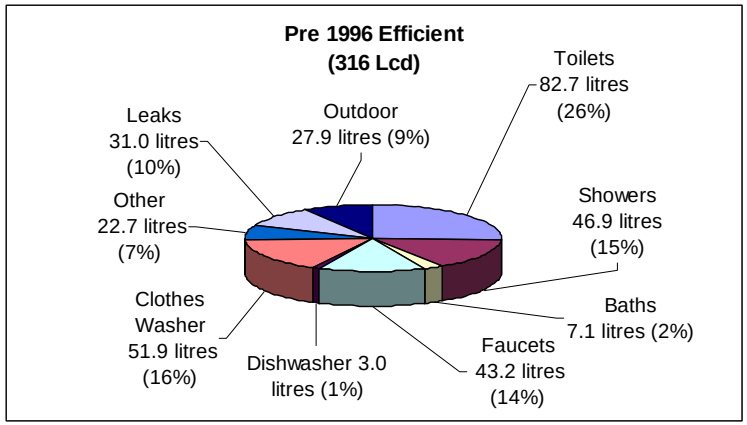
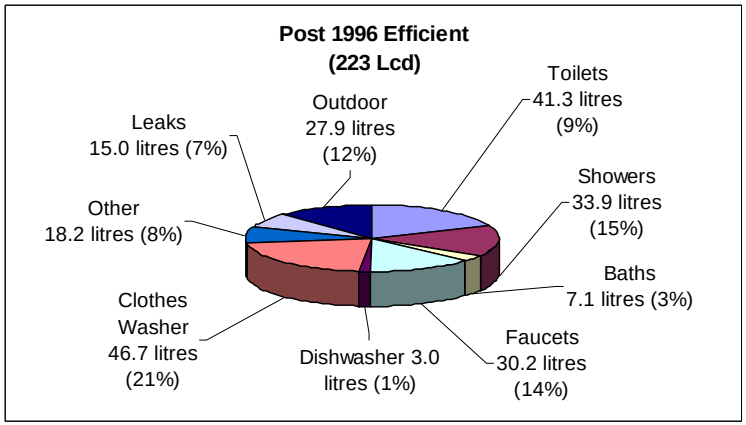
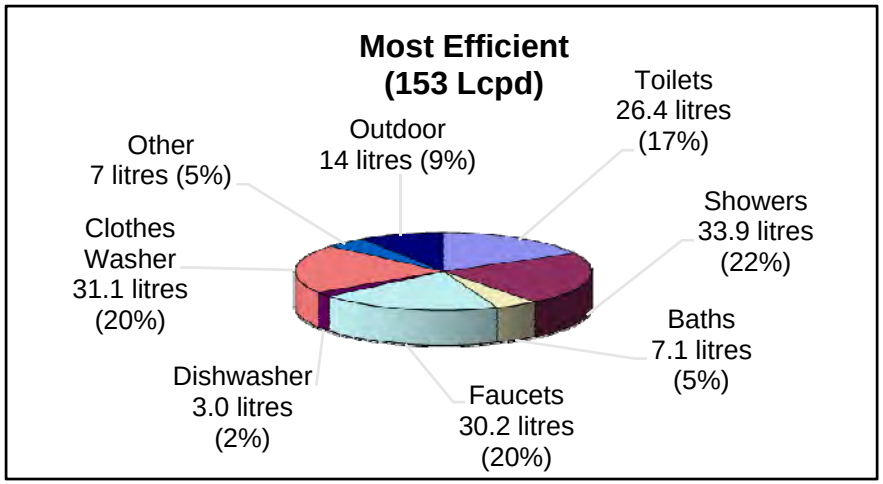
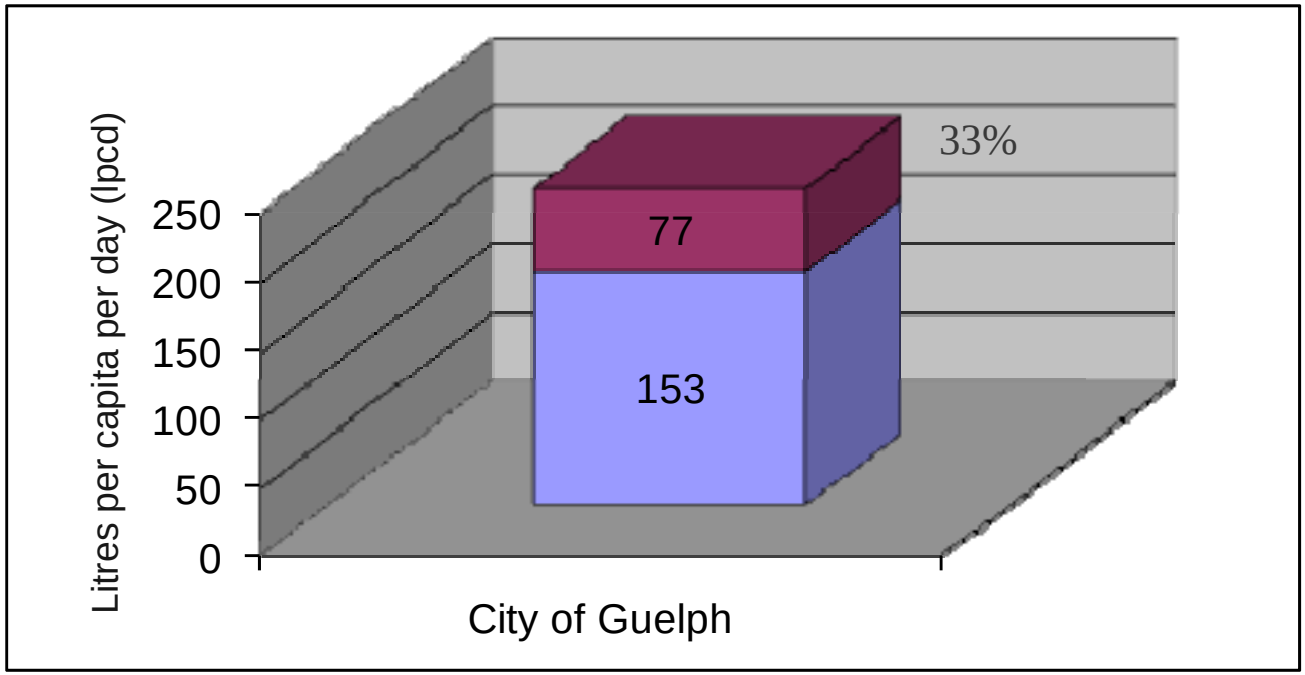






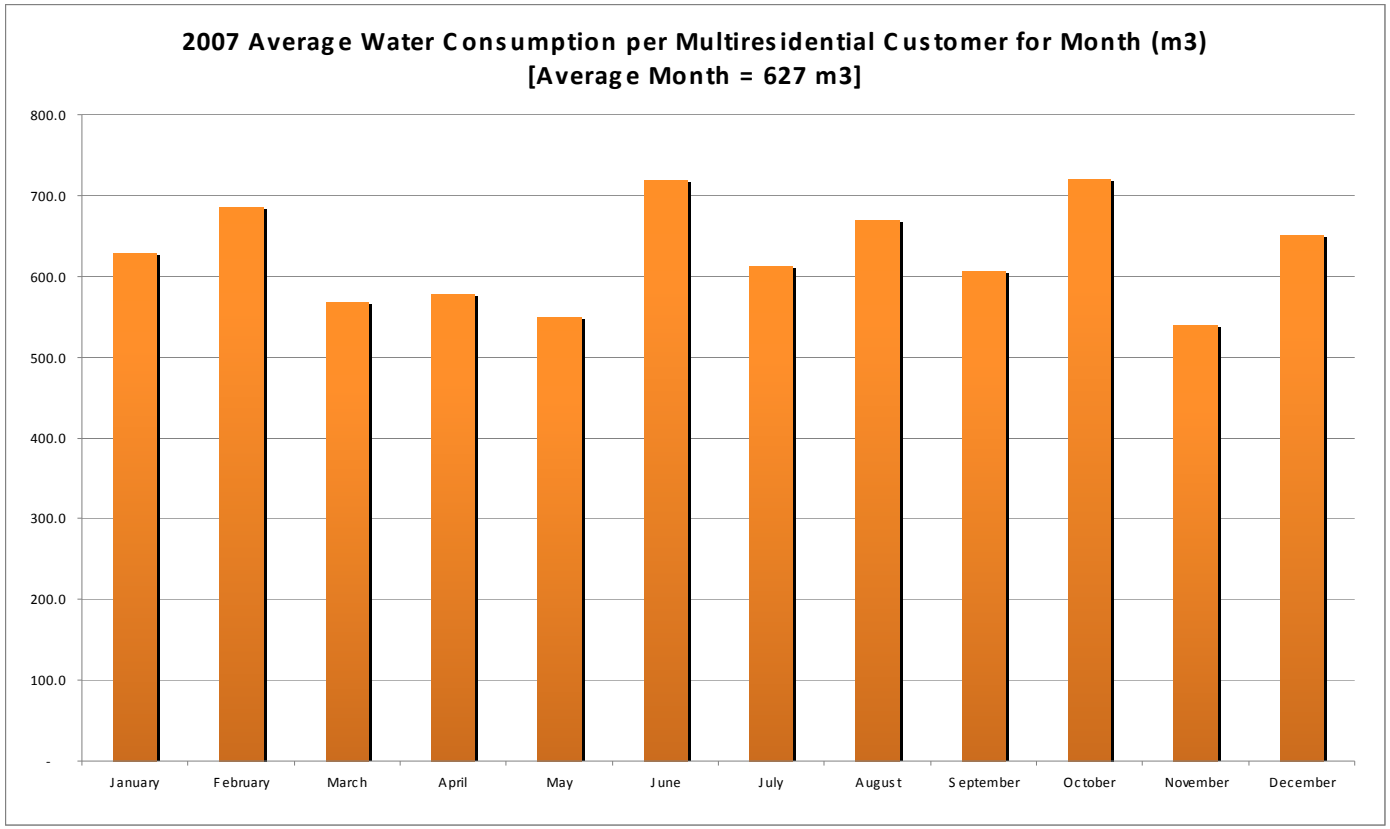
Residential Water Use Demand Analysis

Detached Single Family Residential Water Efficiency Potential

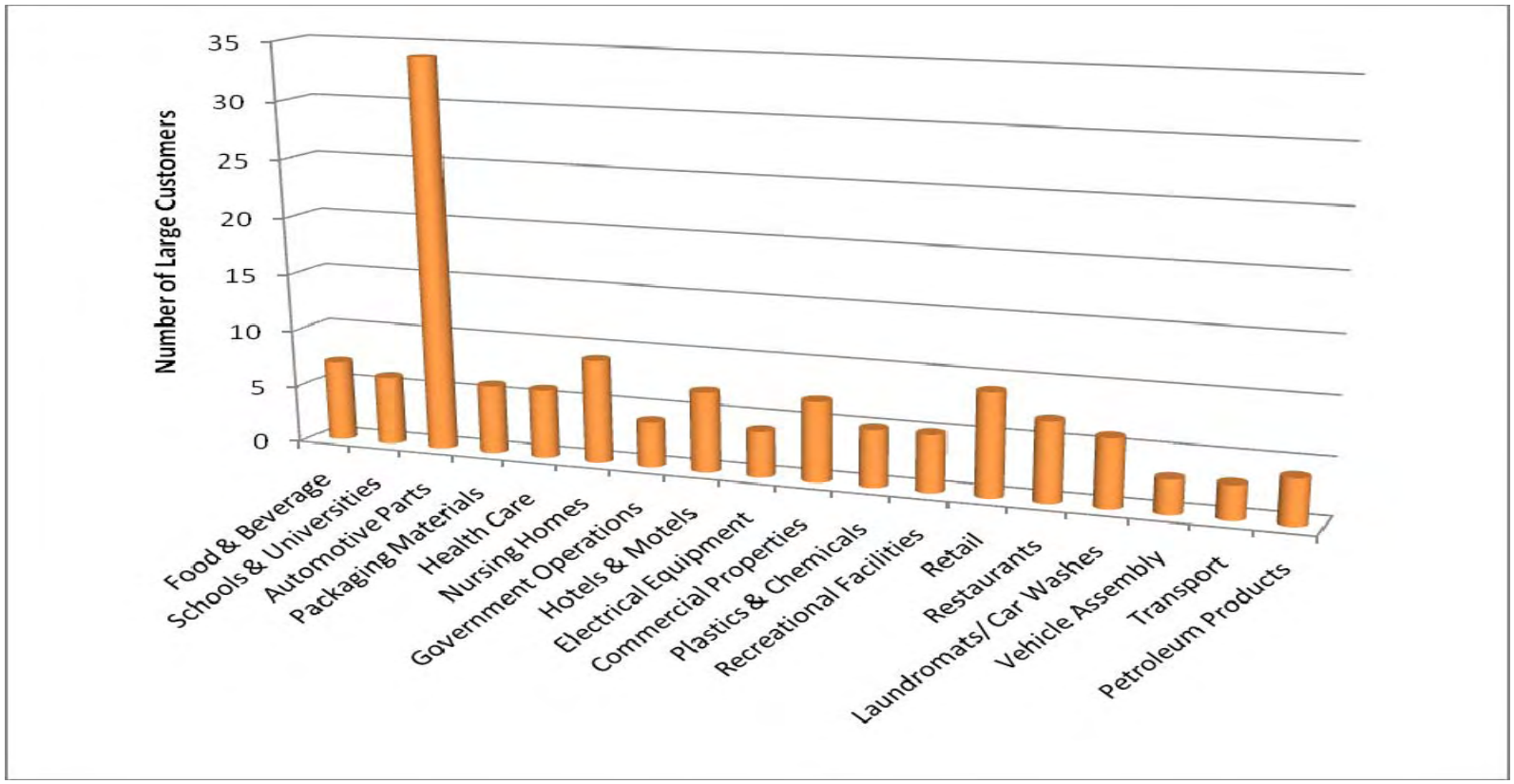


City of Guelph Single Family Residential Avg Water Use: 230 lpcd
Most Efficient Model Single Family Residential Avg Water Use: 153 lpcd

Multi Family Residential Analysis



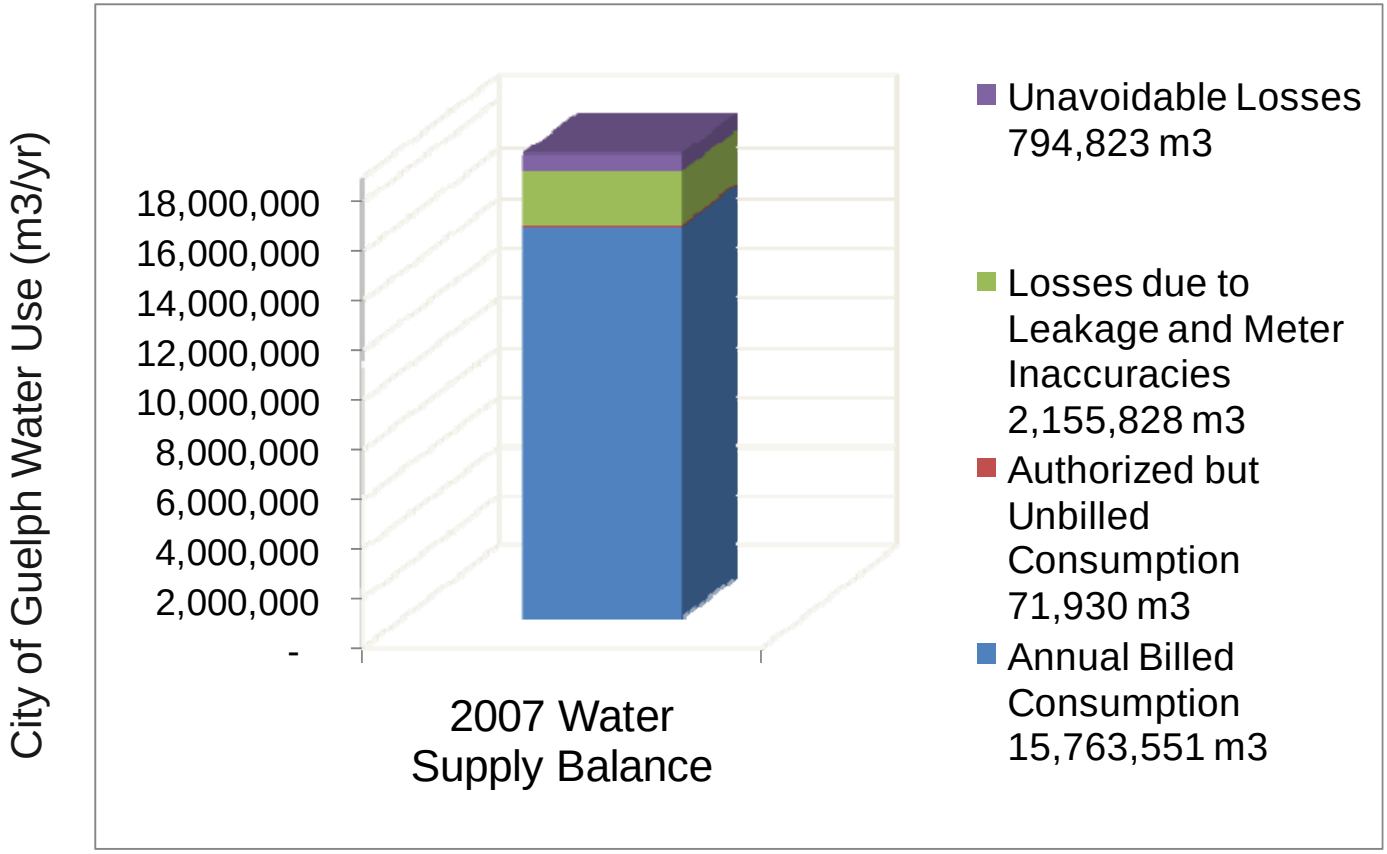
Industrial, Commercial, Institutional (ICI) Analysis



Industrial, Commercial, Institutional (ICI) Analysis

- Largest 133 ICI customers used 4,766,000 m^3 in 2007
- 29,000 people employed in these organizations
- Process water use estimate 4,198,000 m^3
- Domestic water use estimate 360,000 m^3 (approximately 34 lcpd)
- Product water use estimate 208,000 m^3

AWWA / IWA Water Audit and Water Balance Results



Overall Potential for Water Efficiency

Residential Single Family Detached	
Current Demand (2007) lcpd	230
Potential Demand (end use studies) lcpd	153
Potential Savings lcpd	77
2007 Population	94,745
Potential Single Family Savings	2,662,808 m3/year 7,295 m3/day

Industrial ,Commercial, and Institutional	
Current Demand (2007) m3	6,660,534
Estimated Savings 15% per Analysis	990,080
Potential ICI Savings	990,080 m3/year 2,737 m3/day

Distribution Leakage Reduction	
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Potential Multi-family Savings	249,342 m3/year 683.1 m3/day
Potential ICI Savings	990,080 m3/year 2,737 m3/day
Total Potential Water Efficiency Savings	3,911,231 m3/year 10,716 m3/day
Total Potential Water Efficiency and Leakage Savings	**5,006,231 m3/year 13,716 m3/day**
Percentage Saving of 2006 Actual Demand	27% m3/year 27% m3/day

Comparison to Targets in Water Supply Master Plan

Targets from Water Supply Master Plan - 2006

10% reduction of average day demand by 2010
15% reduction of average day demand by 2017
20% reduction of average day demand by 2025

Overall Potential for Water Efficiency

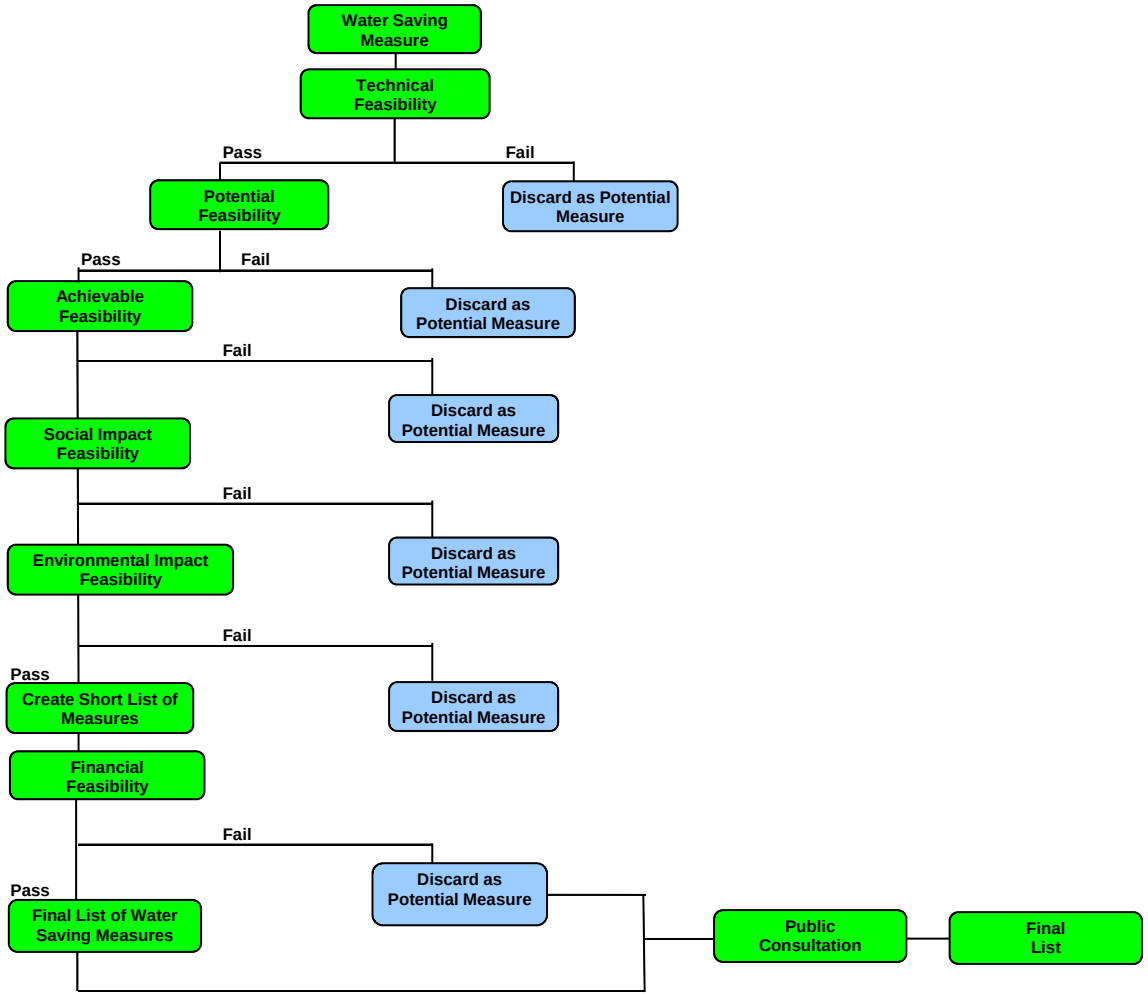
27% reduction of 2006 average day demand

Overall potential for water efficiency assumes a 100% participation rate in both existing and new single family housing, multi-family buildings, ICI and distribution leakage recovery.

Water Conservation and Efficiency Program and Policy Alternatives

Toilet flapper valve replacement	Faucet aerator installation	Grey water reuse	Rainwater harvesting
Toilet variable flush device	Faucet flow restrictor installation	Floor drain primer water	Water efficient landscaping
Toilet tank displacement devices	Automatic motion sensor faucet	Metering and sub-metering	Lawn water gauges and timers
6L toilet installation	Automatic push and touch faucet	Household indoor/outdoor audits	Automatic rain gauges for irrigation systems
High efficiency (HET) toilet installation	Faucet in-line regulator	Commercial food rinse nozzle	ET technology for irrigation systems
Dual flush toilet installation	Leakage repair	Process water reuse	Irrigation head replacement
Showerhead replacement	Garburator restrictions	Eliminate once through cooling	Irrigation distribution leakage reduction
Showerhead flow restrictors	Hot water recirculation	Cooling tower optimization	Green roof technology
Showerheads in-line regulator	Water efficient water softener	Car wash rinse water reuse	Swimming pool management
Water efficient clothes washer	Humidifier controller	ICI indoor/outdoor audits	Decorative ponds and water gardens
Water efficient dish washer	Air conditioning condensate recovery	Public and Youth Education	Rain barrels

Screening of Measures

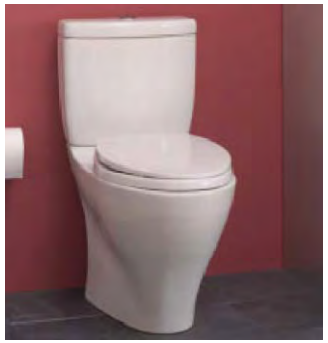


Screening of Measures

Residential Single Family	Technical	Potential	Achievable	Social	Environmental
Toilet flapper valve replacement	√	√	x	x	x
Toilet variable flush device	√	√	x	x	x
Toilet tank displacement devices	√	√	x	x	x
6L toilet installation	√	√	√	√	√
High efficiency (HET) toilet installation	√	√	√	√	√
Dual flush toilet installation	√	√	√	√	√
Showerhead replacement	√	√	√	√	√
Showerhead flow restrictors	√	√	x	x	x
Showerheads in-line regulator	√	√	x	x	x
Water efficient clothes washer	√	√	√	√	√
Water efficient dish washer	√	√	√	√	√
Faucet aerator installation	√	√	√	√	√
Faucet flow restrictor installation	√	√	x	x	x
Automatic motion sensor faucet	√	√	x	x	x
Automatic push and touch faucet	√	√	x	x	x
Faucet in-line regulator	√	√	x	x	x
Leakage repair	√	√	√	√	√
Garburator restrictions	√	√	x	x	x
Hot water recirculation	x	x	x	x	x
Water efficient water softener	√	√	√	√	√
Humidifier controller	√	√	√	√	√
Air conditioning condensate recovery	√	√	x	x	x
Grey water reuse	√	√	√	√	√
Floor drain primer water	√	√	√	√	√
Metering and submetering	√	x	x	x	x
Rainwater harvesting	√	√	√	√	√
Water efficient landscaping	√	√	√	√	√
Lawn water gauges and timers	√	√	√	√	√
Automatic rain gauges for irrigation systems	√	x	x	x	x
ET technology for irrigation systems	√	x	x	x	x
Irrigation head replacement	√	x	x	x	x
Irrigation distribution leakage reduction	√	x	x	x	x
Green roof technology	x	x	x	x	x
Swimming pool management	√	√	√	√	√
Rain barrels	√	√	√	√	√

Water Efficiency Measures Short-listed

Residential Indoor - Rebates



- Ultra low flush toilets – 6 litres
- High efficiency toilets – 4.8 litres
- Dual flush toilets – 3/6 litres

- Water efficient clotheswashers
- Water efficient dishwashers
- Water efficient water softeners
- Water efficient humidifiers
- Grey water reuse

Water Efficiency Measures Shortlisted

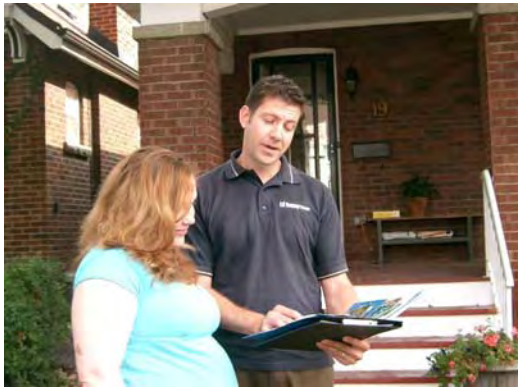
Residential Indoor – Install

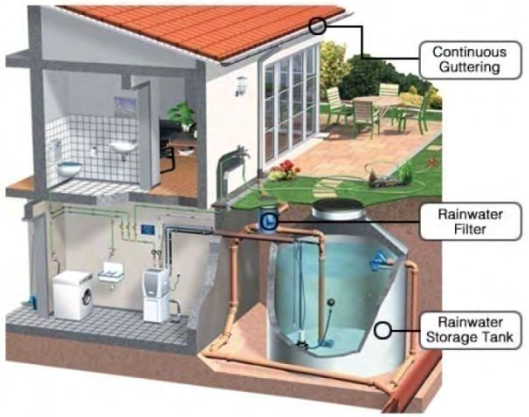
- Low flow showerheads
- Kitchen and bathroom faucet aerators
- Indoor leakage repair

Water Efficiency Measures Shortlisted

Residential Outdoor

- Water efficient landscaping
- Lawn water gauges and timers
- Rain barrels
- Swimming Pool Management
- Rain water harvesting

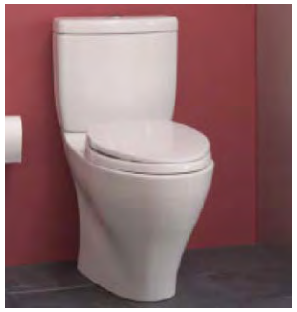




Sectors Considered for Programming Development

- Residential Single Family including Detached, Semi-detached, Townhouse
- Residential Multi-family including Apartments and Condominiums
- Residential new development
- Industrial, Commercial and Institutional
- Distribution Leakage Reduction and Pressure Management

Financial Screening for Measures



Cost of New Water Supply vs. **Cost of Reclaimed Supply**

Cost of construction of new water supply and wastewater treatment infrastructure:
$3.00 to $8.00 /litre capacity/ day
(Southern Ontario range)

Cost of Water and Wastewater capacity reclaimed through water conservation and efficiency program resources:
<$4.00 /litre capacity/day

Financial Screening of Measures

Single Family Indoor		Cost per Participant	Savings per Participant (Lcd)	Cost per litre
Rebates	ULF 6 Litre Flush ($60)	$ 261.00	120	$ 2.18
Rebates	HET Toilets ($75)	$ 290.00	138	$ 2.10
Rebates	Dual Flush Toilets ($75)	$ 290.00	156	$ 1.86
Rebates	Clothes Washer ($80)	$ 150.00	77	$ 1.95
Rebates	Humidifier ($75)	$ 105.00	51	$ 2.06
Rebates	Floor Drain ($60)	$ 90.00	43	$ 2.09
Rebates	Grey Water ($1,000)	$ 5,000.00	90	$ 55.56
Rebates	Rain Water ($2,000)	$ 6,000.00	171	$ 35.09
Rebates	Dish Washers ($60)	$ 88.00	2	$ 44.00
Rebates	Water Softener ($100)	$ 160.00	23	$ 6.96
Installation	Low Flow Showerheads	$ 111.00	110	$ 1.01
Installation	Kitchen Faucets	$ 62.00	29	$ 2.14
Installation	Leakage Repair	$ 216.00	108	$ 2.00
Single Family Outdoor				
Rebates	Watering Timers ($20)	$ 49.00	24	$ 2.04
Rebates	Swimming Pool ($50)	$ 210.00	26	$ 8.08
Other	W.E. Landscape Visits	$ 127.00	74	$ 1.72
Other	Rain Barrels	$ 58.00	3	$ 19.33
Multi- Family Highrise				
Rebates	ULF 6 Litre Flush ($60)	$ 175.00	60	$ 2.92
Rebates	HET Toilets ($75)	$ 198.00	69	$ 2.87
Rebates	Dual Flush Toilets ($75)	$ 198.00	78	$ 2.54
Rebates	Clothes Washer ($200)	$ 2,200.00	1,120	$ 1.96
Rebates	Dish Washer ($60)	$ 78.00	2	$ 39.00
Installation	Low Flow Showerheads	$ 70.00	55	$ 1.27
Installation	Kitchen Faucets	$ 54.00	29	$ 1.86
Installation	Leakage Repair	$ 216.00	108	$ 2.00

Financial Screening of Measures

Single Family Indoor		Cost per Participant	Savings per Participant (Lcd)	Cost per litre
Residential New Development - Indoor				
Rebates	HET Toilets ($10)	$ 60.00	18	$ 3.33
Rebates	Dual Flush Toilets ($10)	$ 60.00	36	$ 1.67
Rebates	Clothes Washer ($80)	$ 108.00	33	$ 3.27
Rebates	Humidifier ($75)	$ 125.00	51	$ 2.45
Rebates	Floor Drain ($60)	$ 105.00	43	$ 2.44
Rebates	Grey Water ($1,000)	$ 3,500.00	90	$ 38.89
Rebates	Rain Water ($2,000)	$ 5,500.00	171	$ 32.16
Rebates	Low Flow Showerheads ($10)	$ 35.00	16	$ 2.19
Rebates	Kitchen Faucets ($5)	$ 18.00	8	$ 2.25
Rebates	Dish Washer ($60)	$ 88.00	2	$ 44.00
Rebates	Water Softener ($100)	$ 150.00	23	$ 6.52
Residential New Development - Outdoor				
Rebates	W.E. Landscaping ($200)	$ 285.00	74	$ 3.85
Rebates	Watering Timers ($20)	$ 57.00	24	$ 2.38
Industrial/Commercial/Institutional				
Rebates	ULF 6 Litre Flush ($60)	$ 1,280.00	590	$ 2.17
Rebates	HET Toilets ($75)	$ 1,400.00	710	$ 1.97
Rebates	Dual Flush Toilets ($75)	$ 1,550.00	830	$ 1.87
Rebates	Clothes Washer ($200)	$ 10,000.00	4,095	$ 2.44
Installation	Pre-Rinse Spray Valves	$ 1,158.00	368	$ 3.15
Other	ICI Audit and Capacity Buyback	$ 54,000.00	40,000	$ 1.35
Distribution Leakage Reduction				
Other	DMAs (5)	$ 15,900.00	115,000	$ 0.14

Financial Screening of Shortlisted Measures

Toilet Replacement (6 litre ULF)				
Single Family	Per Participant	Water Savings (lpd)	Cost per litre/day	
Potential Number of Particpants	20,074			
Number of Participants	360	120		
Number of Toilets/Participant	2.3			
Rebate ($60 per toilet)	$ 138.00			$ 49,680.00
Marketing	$ 38.00			$ 13,680.00
Program Management	$ 60.00			$ 21,600.00
Project Management	$ 25.00			$ 9,000.00
Total per Participant	$ 261.00			
Total for Program	$ 93,960.00	43,200	$ 2.18	$ 93,960.00

Assumptions

- 24,300 single family homes are pre 1996
- 17% of those home have installed ULF toilets
- 24,300 less 17% leaves a potential of 20,074 homes or participants
- there are 2.3 toilets per household
- there are 20,074 x 2.3 = 46,170 potential toilets
- current rate of 2,000 toilet replacements per year
- since 2,000 replacements per year / 2.3 toilets per house = 900 participants per year
- base on recent toilet events, we know that 40% of the purchases are ULF
- therefore, 40% of 900 total participants leaves 360 ULF participants
- (14 litres/flush existing – 6 litre/flush new) x 5.0 flushes/person x 3 pph = 120 lpd

Financial Screening of Shortlisted Measures

Water Efficient Dish Washing				
Single Family	Per Participant	Water Savings (lpd)	Cost per litre/day	
Potential Number of Participants	18,472			
Number of Participants	1,679	2		
Rebate ($60 per washer)	$ 60.00			$ 100,755.27
Marketing	$ 8.00			$ 13,434.04
Program Management	$ 10.00			$ 16,792.55
Project Management	$ 10.00			$ 16,792.55
Total per Participant	$ 88.00			
Total for Program	$ 147,774.40	3,123	$ 47.31	$ 147,774.40

Assumptions

- 24,300 single family homes are pre 1996
- 13% of those home do not have dishwashers and 15% of homes have Energy Star
- 24,300 less 13% and then 15% leaves potential of 17,970 homes or participants
- current average life per 09/2006 Appliance Magazine is 11 years
- current rate of 1,600 replacements per year
- (23.7 litres/cycle existing – 17.5 litre/cycle new) x 0.1 cycles/person/day
  x 3 person/household = 2 lpd savings

Policy Recommendations
Public Advisory Committee Input

Policy Recommendations:

- Heightened public educational and awareness program
- Increased water billing water use benchmark information
- Evaluate feasibility of increasing billing frequency
- Evaluate sub-meter practices for bulk read multi residential settings
- Water softener research required (Magnetic, Conductivity, Resin models)
- New construction based water efficiency standards

Forthcoming Input:

- Water conservation based rate structures

Moving Forward and Next Steps

Water Conservation and Efficiency Strategy Development

- Determine achievable water savings
- Develop delivery strategy
- Develop monitoring and evaluation strategy
- Develop maintenance plan
- Develop short term and long term plan
- Public Consultation of Study Recommendations

Moving Forward and Next Steps

Public Consultation Program

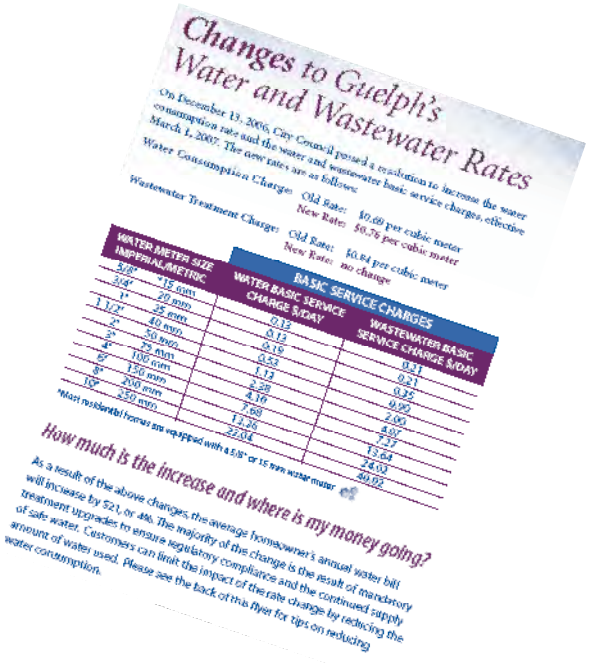
- Incorporate feedback received from PIC #2 into continued development of strategy
- Public Advisory Committee (PAC) #3 – November 26, 2008
- Public Advisory Committee (PAC) #4 – January 2009
- Public Information Centre #3 – late Jan 2009

Anticipated Project Timelines

- Development of draft strategy – Dec 2008
- Water Conservation and Efficiency Strategy Update Guelph City Council Workshop – February 25, 2009
- Presentation of Final Report to City Council – March 2009

Popular Water Efficiency Measures

- Customer water meters
- Codes and regulations
- Conservation type water rates



Changes to Guelph's Water and Wastewater Rates

On December 13, 2006, City Council passed a resolution to increase the water consumption rate and the water and wastewater basic service charges, effective March 1, 2007. The new rates are as follows:

Water Consumption Charge: Old Rate: $0.68 per cubic meter
New Rate: $0.76 per cubic meter

Wastewater Treatment Charge: Old Rate: $0.84 per cubic meter
New Rate: no change

WATER METER SIZE IMPERIAL/METRIC	BASIC SERVICE CHARGES: WATER BASIC SERVICE CHARGE $/DAY	BASIC SERVICE CHARGES: WASTEWATER BASIC SERVICE CHARGE $/DAY
5/8" 15 mm	0.13	0.21
3/4" 20 mm	0.13	0.21
1" 25 mm	0.16	0.25
1 1/2" 40 mm	0.33	0.99
2" 50 mm	1.13	2.00
3" 75 mm	2.28	4.02
4" 100 mm	4.16	7.37
6" 150 mm	7.68	13.64
8" 200 mm	13.26	24.03
10" 250 mm	22.04	40.03

*Most residential homes are equipped with a 5/8" or 15 mm water meter

How much is the increase and where is my money going?

As a result of the above changes, the average homeowner's annual water bill will increase by $21, or 4%. The majority of the change is the result of mandatory treatment upgrades to ensure regulatory compliance and the continued supply of safe water. Customers can limit the impact of the rate change by reducing the amount of water used. Please see the back of this flyer for tips on reducing water consumption.

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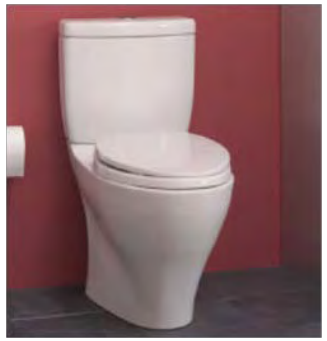
Popular Water Efficiency Measures

Residential Indoor - Rebates



- Ultra low flush toilets – 6 litres
- High efficiency toilets – 4.8 litres
- Dual flush toilets – 3/6 litres
- Water efficient clotheswashers
- Water efficient dishwashers
- Water efficient water softeners
- Water efficient humidifiers

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Popular Water Efficiency Measures

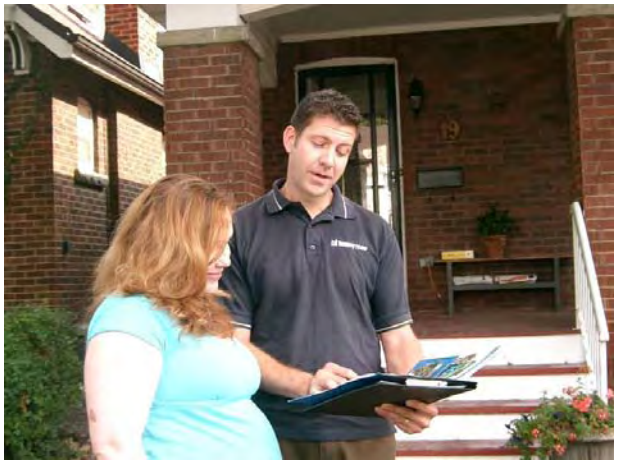
Residential Indoor - Install

- Toilet displacement devices
- Toilet early closing devices
- Toilet syphon break devices
- Dual flush toilet retrofit devices
- Low flow showerheads
- Kitchen and bathroom faucet aerators

Popular Water Efficiency Measures

Residential Outdoor

- Water Efficient Landscape Visits
- Rebates for Irrigation controllers
- Rain barrels



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Popular Water Efficiency Measures

Industrial, Commercial and Institutional

- Comprehensive water audit
- Capacity Buy-back

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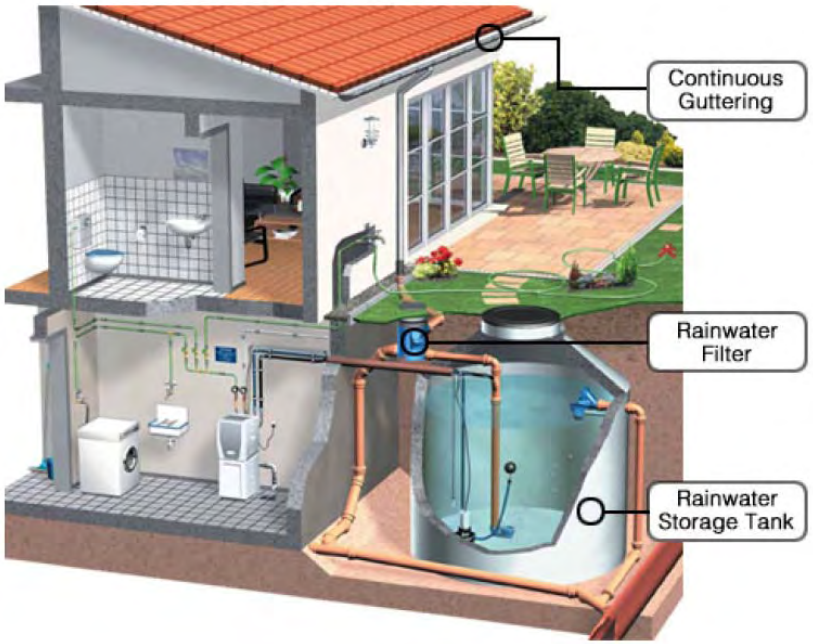
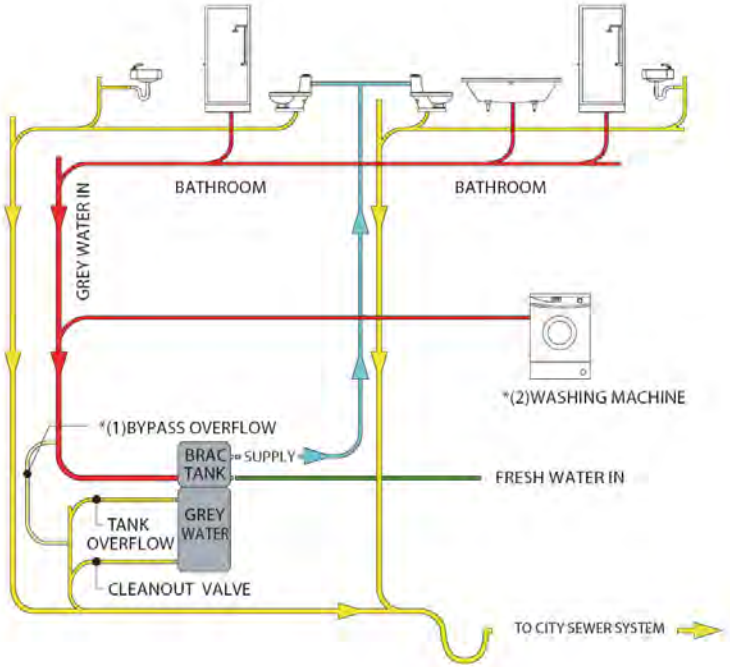
Popular Water Efficiency Measures

Emerging or "Re" – Emerging Technologies

- Grey water re-use
- Rain water harvesting





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Popular Water Efficiency Measures

Broadscale Education

Homeowner's Landscape Visit Package, 1,000 home visits completed per season

- Water bill inserts and bulletins
- Literature
- Public displays and speaking engagements
- Website

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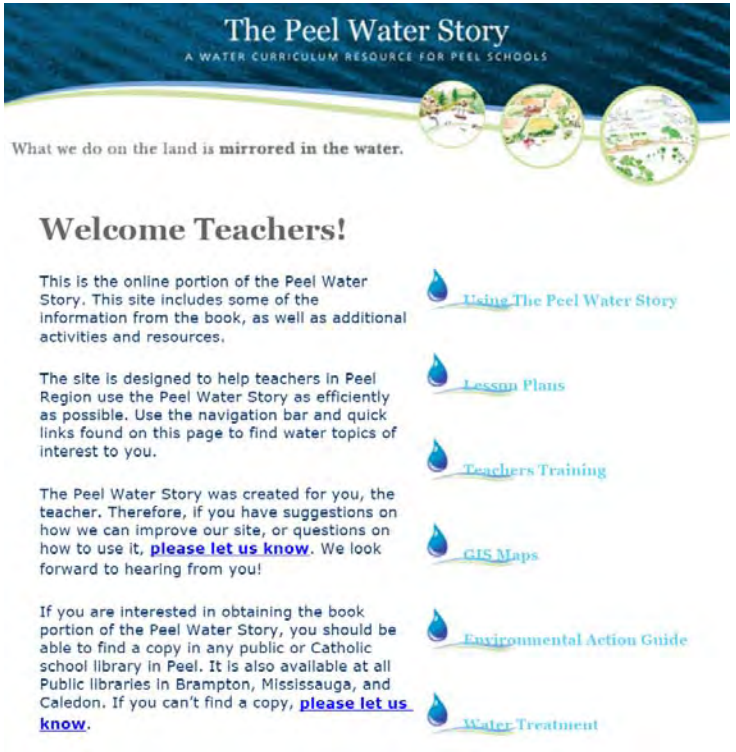
Popular Water Efficiency Measures

Youth Education

- In school programs



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Popular Water Efficiency Measures

Youth Education

- Children's Water Festivals

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Moving Forward and Next Steps

Strategy Development

- Screening of water saving measures
- Short list of water saving measures
- Determine achievable water savings
- Determine costs of water saving measures
- Develop delivery strategy
- Develop monitoring and evaluation strategy
- Develop maintenance plan
- Develop short term and long term plan

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Moving Forward and Next Steps

Public Consultation

- Public Information Centre (PIC)
    - August 27, 2008, 6:30 p.m.
    - Holiday Inn Guelph, Oakwood Ballroom
    - Information flyer in development
- Next Public Advisory Committee Meeting
    - September 2008
- Final Public Information Centre
    - October 2008

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City Of Guelph Water Conservation and Efficiency Strategy Update
Public Information Centre #2
November 20, 2008

Event Comment and Question Sheet

In review of the suite of water efficiency or conservation policies/measures identified through the study do you feel there are any potential conservation policies/measures that have been missed?

_____
_____
_____

Some water efficiency measures may not be cost-effective. In other words, the water efficiency measure may be more expensive than the cost of building new water supply infrastructure. In the absence of this cost evaluation, would you see any benefits in including some of these water efficiency measures and how would you suggest that these measures be included as part of a program?

_____
_____
_____

If you were to design a Water Conservation and Efficiency Strategy for the City of Guelph, what key programs/policies would your strategy include?

_____
_____
_____

In your opinion do you feel that water conservation and efficiency can solely provide the necessary water supply to support future community growth?

_____Yes _____ No

Do you think that the City of Guelph's Water Conservation and Efficiency Strategy Update should include a goal of maintaining current annual water taking levels in spite of future population growth?

_____Yes _____ No

In your opinion, what barriers exist that would limit the City's success in achieving its water reduction targets?

_____
_____
_____

Additional comments and feedback:

_____
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Thank you comments!

Completed comment sheets may be submitted to Water Conservation and Efficiency Strategy Update Project Team members at the Public Information Centre. Alternately comments may also be received by fax at: 519-822-8837 following completion of the event.

Guelph water
Ours to conserve. Ours to protect. Ours to enjoy.

Water Conservation and Efficiency Strategy Update
Guelph Public Information Centre
Thursday November 20th, 2008
6pm – 9pm
Oakwood Ballroom, Holiday Inn, 601 Scottsdale Drive

Wayne Gallagher welcomed everyone and thanked everyone for coming.

Michael provided an update of the Water Conservation and Efficiency Strategy Update – Presentation is available online at http://guelph.ca/living.cfm?subCatID=2007&smocid=2581

Question: Why are there no leaks in the ideal home, is that possible?

Answer: It is possible when the plumbing and fixtures are new, but as they age, leaks will develop. That is why an ongoing maintenance program is important.

Question: Does the screening assume only one rain barrel per household?

Answer: Yes, it does, so the storage capacity is limited. As you add more rain barrels you add more capacity.

Question: These technologies discussed here come from all over the world, where did rain barrels come from?

Answer: Rain barrels can be found all over the world but are very popular in Australia, the UK and Europe. Here in Canada, the Region of Waterloo is probably the most successful example of a municipality distributing rain barrels. They may not generate a lot of water savings, but they are great icon for water conservation.

Question: Where did you get these water saving ideas from?

Answer: Studies were looked at from all over the world. RMSi works for utilities in the UK, Trinidad and Tobago, as well as Ontario. Another good source has been the AWWA, OWWA, and CWWA.

Question: What do they do in the UK that we don't do here to be so efficient?

Answer: This is a common question and the simple answer is that we don't know for sure. They have been doing lots of work on distribution leakage, but little in efficiency. Unfortunately they have not completed any extensive end use studies like we have in North America.

Question: What is the average cost of water in the UK?

Answer: The cost is two to three times more than in Ontario. This definitely affects usage.

Question: Why is conservation pricing not in this study?

Answer: Guelph views the question of conservation pricing very seriously and as such has initiated a separate study on the matter. A variety of rates scenarios are being compiled and will be brought to the Public Advisory Committee for feedback.

Question: Are the rebates listed here going to the developers for water efficient technologies?

Answer: Currently, that is the concept. Please remember that this is a work in progress and that nothing is written in stone. The concept would be that a "package" of water saving measures be offered to the builder in order to enhance the new home's water efficiency.

Question: What is the capacity of the rain water barrels?

Answer: Approximately 200 litres capacity.

Question: Are any of the measures that passed all the screening applicable to the ICI sector?

Answer: ICI sector is very different as compared to the residential. In the residential sector every home will have at least four similar water fixtures or appliance. This is not the case for the ICI sector where every facility could be different. What is generally offered to the ICI sector is an audit program with an incentive mechanism to encourage implementation of the recommendations from the audit.

Question: Why are we not looking at sub metering in multi residential?

Answer: It was screened but did not pass the screening. There is just not enough information on the potential savings for sub metering apartments. It would be very difficult to install sub meters in existing high rise buildings but could be bult into newly constructed buildings. This may be an option to consider. The other consideration is that this market sector is quite low already at 153 lcpd and we see that coming down significantly with toilet and clothes washer programs.

Question: Have we considered alternatives to water softeners such as dishwashers with built-in water softeners?

Answer: We were not aware of product, but it is a good lead and we will look into it. There is a new study being done with water softeners that may provide us with more details that could change the screening results.

Question: What do you mean by the term “Toilet Events”?

Answer: It refers to week-end sales events with retailers offering instant rebates provided by the municipality.

Question: Were seasonal uses calculated annually?

Answer: Yes, the seasonal use (i.e. summer) is annualized over the year. This can also be used as a peak demand program under a separate analysis.

Question: Is the cost for water supply looked at from a peak day perspective?

Answer: We are only looking at the cost of new water and wastewater supply infrastructure costs. Marginal costs or operating costs are not being considered at this point.

Question: What about the cost of the pipeline to meet just the demands of the peak day demand?

Answer: Systems are designed and built to meet peak demands so the additional cost is built into the cost for new supply infrastructure.

Question: The electrical utilities have introduced smart metering with one objective of improving efficiency. This is to help consumers manage their electrical use. Are there any examples of this happening with water?

Answer: Yes, in Moncton they do daily readings utilizing an automatic meter reading (AMR) system. High water use is flagged and a call is placed to the customer to alert them. Also in California they are piloting a beacon type alert system for high water use with an indoor lamp that changes colours according to water use. AMR technology will also provide more details for daily water use and provide more detail for supply and customers. North Bay – just finished a study in AMR technology, it was very cost effective.

Question: For the non-feasible ones that were related to peak days, can we do a peak day only analysis on those that failed to re-evaluate as an over reductions on the system demand.

Answer: Yes, this may be possible and the results will be reported at the next meeting.

Question: Instant hot water supplies, is this feasible and will it save water. Are we looking at this?

Answer: A study on instantaneous water heaters was provided at a recent conference. The study indicated that there were no water savings associated with these devices. The results were not supportive of water savings, just energy savings.

Question: Did we look at other cities and how they manage their green canopy to slow up the rains and slow heavy rains for more consistent river flows?

Answer: Council strategic plan does address a robust urban canopy of trees. This is for better storm water management. On the Grand River Conservation Authority website, you can look at the water levels of the Speed River; there is not a lot of variance in the levels after storms. Rain water harvesting also helps to mitigate storm flows.
(http://www.grandriver.ca/index/document.cfm?Sec=2&Sub1=6&Sub2=9_)

Group Discussion:

What barriers exist that would limit the City's objective of achieving water savings as a result of implementing a Water Conservation and Efficiency Strategy?

- Aesthetics - low flush toilets have less water in the bowl that results in the bowl still being dirty after a flush. There are also comments about the aesthetics of rain barrels and xeriscaping.
- The 6 litre toilets still have a stigma attached with them from the original models that did not have an effective flush.
- Water rates are not high enough to act as an incentive. It will be difficult to convince Council to create aggressive rates that would encourage conservation.
- Basic service charge is also a barrier. There is no incentive to save as you pay the same monthly charge. We need a rate system that charges more as you use more water. Less if you use less water.

Are there any other water efficiency or conservation measures that the consultant's team has missed?

- Removing water softeners from homes where water softening appliances are installed.
- New technologies in water softeners i.e. magnetic/resin based.
- A new study by the city of Guelph and Waterloo Region will provide more data on water softeners that will assist with the screening of these products.

- Does a water softener improve toilet performance? No, just keeps the toilet cleaner.
- There seems to be a reluctance by the City to introduce water conservation rates.
- The program for industry is a good program. F&M Brewery is very inspired by that prospect.
- Multiple rain barrels – there are several properties with these. There maybe better water savings with the larger capacity cisterns. Would that be a better approach than the current single rain barrels approach?
- Grey water and rain water systems would be included in new construction and retrofit programs. New homes could be pre-piped so that they are "grey water ready".
- Are there by laws that exist to inhibit/prohibit cisterns? Older homes did have cisterns. The building code does have some restrictions, but not specifically for grey and rain water harvesting, but the restrictions make it difficult. The code is designed to protect health and provide safety.

Do you think that the City of Guelph's Water Conservation and Efficiency Strategy Update should include a goal of maintaining current annual water taking levels in spite of future population growth?

- Yes, this can be accomplished.
- We have to. We don't have a choice.
- We do have a choice, but it depends on how much money you want to spend.
- If you spend enough money, you can make it happen.
- Need education to get the maximum participation.
- If you want to achieve ambitious goals, we need to fix the infrastructure today.
- There are a lot of people who care about conservation and not having a pipeline. With education, people can make the connection.
- People may not connect water conservation to the pipeline.

When this plan was started, it was acknowledge that Guelph is a very environmentally aware community. The PIC process is usually not very well attended. We were told that we could expect a large turn out. Where is everyone?

- Maybe some are at other meetings. There is a lot going on in the community.
- Can you track on the web for those who couldn't make it but are interested? Yes the City can track that type information.
- Focus groups and surveys were completed to capture the community's thoughts. These are both available online.

Comments from feedback sheets:

In review of the suite of water efficiency or conservation policies/measures identified through the study do you feel there are any potential conservations policies/measures that have been missed?

“It is critically important that Guelph’s DC contain different charges for buildings that meet a high standard of energy and water use efficiency”

“Incentives for developers to be industry leaders including public and media profiling”

“Grey water for outside use – passive irrigation”

“Please add soil conservation by-laws for new builds. It will make water use more efficient in these areas in the future”

“Require landlords to bill water usage separate from the base rent fee. There are many rental units in this university town! I’ve recently moved to an apartment in which my water use is wrapped up in a lump-sum fee. I find that even as a conserve conscious person I am less careful with my water use.”

“Replace existing water softeners with major appliances that have built in softeners like dishwashers”

“Conservation pricing”

Some water efficiency measures may not be cost-effective. In other words, they are more expensive than building new water supply infrastructure. Do you see any benefits in including some of these measures and how would you suggest we include them in a program?

“It is unlikely that non cost efficient measures will be necessary – Go as high as $8/litre supply saved”

“Lawn watering should be permanently banned. Only high efficiency water softeners allowed”

“Start with cost effective measures. Build in rain water harvesting even if not (the) most cost effective. Help people become more aware and self reliant.”

“Find and promote the most efficient aspects of these programs”

If you were to design a Water Conservation and Efficiency Strategy for the City of Guelph what key programs/policies would your strategy include?

“There should be timely monitoring of water taking amounts to check that total taking is not increasing and remedial actions (more intense reduction programmes) if a trend of increase is observed”

“Communications – what do we use, where are we headed to. Get people pulling together you will need to be clear about why this is important. Look at community-based social marketing approaches.”

“Training for contractors and renovators and retailers so that they become vanguard of conservation initiatives and retrofitting”

“A combinations of carrot and stick rebates and water price increases”

In your opinion do you feel that water conservation and efficiency can solely provide the necessary water supply to support future growth?

“Yes” (x 2)

“Don’t know if this is realistic, but it would be great if it could”

“Yes, we must absolutely not abandon the quest!”

Do you think that the City of Guelph’s Water Conservation and Efficiency Strategy Update should include a goal of maintaining current annual water taking levels in spite of future population growth?

“Yes” (x4)

“Great idea!”

“Note how important this change in policy is both for driving the water efficiency/conservation activity and for setting an example that applies to energy use and other resources use.”

In your opinion, what barriers exist that would limit the City’s success in achieving its water reductions targets?

“Not properly educating, challenging and motivating the whole community to implement the necessary challenges”

“Reluctance to use pricing of water aggressively enough to decrease consumption”

“Community knowledge of current situation. Community participation i.e. apathy”

“Lack of education (education at the primary/grade school level is so important) and also a simple lack of care (bad attitude) toward these measures”

Other comments:

“Like to see this plan put in context of big picture supply questions for City of Guelph. Context is important, although outside the scope of consultant’s work. Make your decision making criteria clear for public that can’t understand your decisions”

“To expand on the D/C charge issue. It is very damaging, counterproductive and stupid to have undifferentiated D/C. The water and wastewater portion of D/C should be $0 for high efficiency dwelling units and for all other high efficiency units.“

“On water charges, Tunisia and Morocco have instituted a strongly differentiated charge. Household using no more than daily amount pay a very low charge. Once the use rises above that amount the household pays marginal cost of water for all the water taken., not just on the amount above the minimum amount”

“Check data for City of Santa Clara California which has banned all water softeners and is completing a removal program for existing softeners.”

CITY OF GUELPH

WATER CONSERVATION AND EFFICIENCY STRATEGY UPDATE

Draft Executive Summary

February 4, 2009

RMSi Resource Management Strategies Inc.

Protecting resources for future generations

Executive Summary

The City of Guelph has a history of environmental stewardship and leadership. This attitude and action can be observed in the area of water conservation. As one of the largest cities in Canada dependent solely on a groundwater source of water supply, Guelph has been providing water conservation and efficiency education for a number of years and more recently technical programming such as toilet and water efficient clothes washer rebates as well as Industrial, Commercial and Institutional audits and incentive programs.

In June, 1998, the City of Guelph initiated a Water Conservation and Efficiency Study (WC&E) to develop a comprehensive water conservation and efficiency plan for the City's residential, industrial, commercial and institutional sectors. The study established an integrated relationship between the environmental, technical, regulatory and social acceptance of numerous water efficiency alternatives and upon completion in 1999 the Water Conservation and Efficiency study identified the following set of recommendations:

- That City staff accept the Water Conservation & Efficiency Steering Committee's recommended Water Conservation & Efficiency Plan and prepare regular reports on the status of the City's water supply and wastewater treatment capacity.
- That Alternative Day Lawn Watering remain mandatory.
- That a permanent ban on lawn watering not be implement, however, the ability to temporarily eliminate lawn watering in the event of an emergency be retained.
- That city Staff be directed to require individual metering, where feasible, in all new multi-residential housing.
- That the City continue to track and assess innovations in water conservation and efficiency technology and pursue changes in applicable legislation. Opportunities for inclusion of new or improved technologies should be evaluated on a regular basis.
- That a water rate study, in order to reassess peak period and conservation pricing, be completed by January 1, 2002.
- That the City of Guelph undertake a water audit of City facilities beginning in 1999, and commence installation of required water conservation and efficiency fixtures in order to lead by example.
- That the City continue to pursue opportunities to use the water bill as an educational tool.
- That staff be directed to review processes to regulate automatic lawn water sprinkler installation and maintenance.
- That staff be directed to encourage owners of private distribution system to minimize their unaccounted for water (UFW).
- That staff consider implementing an environmental management system, such as ISO 14000, for the Waterworks and Wastewater Services, and promote similar environmental management systems in the private sector.
- That the City continues its policy of charging full water and wastewater rates for all water used.
- That various funding methods be investigated for the financing of water conservation and efficiency methods.
- That the City establish and Implementation committee to oversee development of the Water Conservation & Efficiency Plan.

To meet future water supply requirements to service and sustain projected community growth, the City initiated the Guelph Water Supply Master Plan in 2004. Through the development of the Water Supply Master Plan, the employment of an enhanced water conservation and efficiency strategy, mitigation of distribution-based water loss, and education/policy/rate based reviews, were identified as the preferred short-term options to reclaim critical supply capacity in concert with optimization and rehabilitation of current supply based infrastructure. With a finite groundwater source, and uncertainty regarding the availability of further groundwater sources or impact of additional water taking from current sources, the finalized 2006 Water Supply Master Plan identified sustainable growth potential in the City contingent upon the success of aggressive water conservation and efficiency programs. As part of the 50 year Master Plan water conservation was recognized as a preferred short term source of water supply and recognized the following time based water reduction targets:

- 10% reduction in 2006 total average day water use by 2010
- 15% reduction in 2006 total average day water use by 2017
- 20% reduction in 2006 total average day water use by 2025

Upon Council's approval of the Water Supply Master Plan, full implementation of the 1999 Water Conservation and Efficiency Study was undertaken with enhanced annual financial support granted to the City's Water Conservation and Efficiency Program in support of pursuing the above targets in the time required to undertake an update to the City's Conservation and Efficiency Strategy.

In 2007, the City Council endorsed the Community Energy Plan which noted the per capita water and energy goal of *Using less energy and water per capita than any Comparable Canadian City.* Later that year, the goal was reiterated and identified through Goal 6 of the City of Guelph 2007 Strategic Plan, noted below:

Natural Environment - A leader in conservation and resource protection/enhancement:

Strategic Objective 6.5 – Use less energy and water per capita than any Comparable Canadian City.

With the emergence of regulatory and technology advancements since the completion of the City's original 1999 Conservation and Efficiency Study, City staff began development of the Water Conservation and Efficiency Strategy Update in February of 2008. For assistance in the development of the strategy, City staff retained project consultant Resource Management Strategies Inc. (RMSi) through a request fro proposal process. Included in RMSi's extended consulting team was Leapfrog Energy Technologies, David Pearson Consultancy, Hetek Solutions and B+T Engineering.

The goal of the Water Conservation and Efficiency Strategy Update was to identify preferred program, policy and resource alternatives to best meet the water reduction goals identified in the Guelph Water Supply Master Plan, Community Energy Plan and Council Strategic Plan. In addition, the Water Conservation and Efficiency Strategy Update was to identify preferred program implementation forecasts, and program support staff and maintenance based resources required to meet and sustain the water reduction goals over the planning period.

With the importance of ongoing public consultation throughout the development of the Water Conservation and Efficiency Strategy Update, the formation of a Water Conservation and Efficiency Strategy Public Advisory Committee (PAC) was endorsed by Council. Following Council approval the PAC was formed to work with the staff and project consultant team. A total of 14 members were selected from a variety of stakeholders groups including:

- City Council (1)
- Industry (2)
- Home Builders/Development (1)
- Environmental Interest (3)
- Plumbing (1)
- Academia -University of Guelph (2)
- Grand River Conservation Authority (1)
- Public at Large (3)
- Chamber of Commerce (1)

The PAC met four times throughout the development of the strategy and provided new ideas, direction and initiatives for the consultant team to consider while providing feedback to key findings and progress provided.

To solicit feedback from further members of the public, a series of Public Information Centres (PICs) were held through the Strategy Update process. Through these events, residents and area stakeholders were introduced to the project scope and planned activities, and provided with results to date including: public consultation, market research, residential water use demand analysis, Industrial, Commercial and Institutional water use demand analysis, evaluation of distribution system water loss and water supply demand forecast. As part of each event, a round table discussion was held to obtain input towards the direction of the strategy and to solicit programming ideas.

As a first step to the study, focus groups were held to capture community input to the process through qualitative market research. The data captured does not provide statistically relevant information. However, information gained from the focus groups was used to develop context around water conservation and efficiency, understand issues and local concerns, and explore the appropriate means of communications to achieve success in project development and delivery. In total, three (3) focus groups were conducted on April 22nd, 2008 at a professional focus group facility in Guelph, moderated by a professional market researcher. Each group consisted of 5-7 participants, and lasted approximately 90 minutes. Participants in this research were randomly recruited residents of the City of Guelph.

Finally, a customer survey was completed to capture community input in a quantitative manner, providing statistically significant data that could be extrapolated to the entire community. To accomplish this, 400 randomly selected Guelph residents on municipal water supply were contacted by telephone between June 23rd and June 30th, 2008. Residents were asked a series of questions pertaining to water and water conservation in their community. Through this process, there was a series of scaled (i.e. choose 1- 10), and both open (i.e. how do you feel about…) and closed ended questions (i.e. yes or no).

Information gathered provided data on demographic information, general public knowledge, participation and satisfaction in water efficiency programs offered by the City of Guelph, water use behaviour indoors and outdoors, willingness and desired/required incentives for implementing water saving mechanisms.

The promotion of water conservation and efficiency is not new in the City of Guelph. Since the development of the Water Conservation and Efficiency Study (WC&ES) in 1999 the City has been actively completing a whole range of water efficiency measures including:

- Royal Flush Toilet Program, a rebate program introduced in 2003
- Smart Wash Clothes Washer Rebate Pilot Program, a rebate program launched February 2008
- Industrial, Commercial and Institutional (ICI) Water Capacity Buyback Program, introduced in 2007
- Outside Water Use Program, out water use restrictions introduced in 2001
- Landscape Assessment Pilot Program, launched in May, 2008
- City of Guelph Facility Water Efficiency Retrofits, a program to lead by example
- Public Education and Outreach including
    - Waterloo / Wellington Children's Water Festival
    - Guelph International Resource Centre (GIRC) Water Efficiency Workshop Series (2007/2008)
    - 2008 City of Guelph Water Conservation Breakfast Workshop
    - Green Impact Guelph (GIG) Partner
    - Annual Waterworks Open House
    - Guelph Water Conservation and Efficiency Awards
    - Participation in numerous Community Events and Festivals

These above activities have contributed to significant water savings since 2003 as indicated in the following Table 1.

Table 1: Water Efficiency Results since 2003

Water Conservation Savings by Year 2003 to 2008				
Year	Program	Savings (m3/day)	Savings (m3/yr)	Total Annual Savings (m3/yr)
2003	Royal Flush	80.0	29,200.0	29,200.0
2004	Royal Flush	80.0	29,200.0	29,200.0
2005	Royal Flush	80.0	29,200.0	29,200.0
2006	Royal Flush	80.0	29,200.0	29,200.0
2007	Royal Flush	81.9	29,893.5	
2007	ICI Capacity Buyback - U of G	312.0	113,880.0	143,773.5
2008	Royal Flush	189.1	69,021.5	
2008	ICI Capacity Buyback - Cargill	190.0	69,350.0	
2008	Smart Wash Program	30.0	10,950.0	149,321.5
Total Savings		**1,123.0**		**409,895.0**

In order to develop the strategy, significant investigation and analysis of previous plans and strategies, water system, infrastructure, capital plans, demand forecasts, population projections and housing trends. The key findings are as follows:

- Gross water demand (total billed water supplied divided by population) has declined 17% from 444 litres per capital per day (Lcpd) in 1999 to 370 Lcpd in 2007,
- The City's population increased 14.6% from 101,857 residents in 1999 to 116,766 in 2007;
- The Residential Single Family water demand (total billed residential single family water supply divided by single family population) of 230 Lcpd in 2007 is significantly lower that the Canadian national average of 335 Lcpd and lower than most Ontario communities;
- The Residential Multi Family water demand (total billed residential multi family water supply divided by multi family population) was 153 Lcpd in 2007;
- 5% or 133 Industrial, Commercial and Institutional customers consume 80% of the overall water demand in that sector;
- Based on 2007 data, the City of Guelph has a Infrastructure Leakage Index (ILI) of 2.94 placing it in the Performance Category B with the potential for some improvement;
- The City is currently saving 1,123 m3 per average day of water as a result of its water conservation and efficiency efforts since 2003.

The research, technical analysis and public consultation completed as part of the Water Conservation and Efficiency Strategy Update has resulted in the following program recommendations.

Recommended Water Conservation and Efficiency Strategy Components

Single Family Detached Residential Indoor Measures

- Provide rebates to residents who replace inefficient 13L toilets and install ultra low flow toilets, high efficiency toilets or dual flush toilets.
- Provide rebates to residents who purchase and install water efficient clothes washers, water efficient central humidifiers and floor drain covers.
- Provide rebates to residents who install a grey water reuse system.
- Provide rebates to residents who install a rain water harvesting system.
- Visit homes and install free of charge low flow showerheads, low flow kitchen aerators and repair any water leaks while there.

Single Family Detached Residential Summer Demand Measures

- Provide rebates to residents who purchase and install watering timers.
- Visit homes and educate residents on how to maintain their lawns and water less and how to convert their properties to water efficient landscapes.
- Provide rebates or subsidized pricing for residents who purchase a rain barrel or larger water storage unit.

Multi Family Residential Indoor Measures

- Provide rebates to building owners who purchase and install ultra low flow toilets, high efficiency toilets or dual flush toilets.
- Provide rebates to building owners who purchase and install a water efficient clothes washer in their laundry rooms.
- Visit apartments and install free of charge low flow showerheads, low flow kitchen aerators and repair any water leaks while there.

Residential New Development Indoor Measures

- Provide rebates to builders who purchase and install high efficiency toilets or dual flush toilets, low flow showerheads and low flow kitchen faucets.
- Provide rebates to builders who purchase and install water efficient clothes washers, water efficient central humidifiers and floor drain covers.
- Provide rebates to builders who install a grey water reuse system.
- Provide rebates to builders who install a rain water harvesting system.

Residential New Development Summer Demand Measures

- Provide rebates to builders who install watering timers.
- Provide rebates to builders who offer and provide water efficient landscapes.

Industrial/Commercial/Institutional Measures

- Provide rebates to facilities who replace inefficient 13L toilets with ultra low flow toilets, high efficiency toilets or dual flush toilets.
- Provide rebates to local businesses who purchase and install a water efficient clothes washer in their operations.
- Visit commercial kitchens and install free of charge low flow pre-rinse spray valves.
- Complete ten comprehensive water audits per year and offer a capacity buy-back rebate to any facility that implements all or some of the water saving recommendations.

Municipal Measures

- Design and implement five (5) district meter areas per year for three years. Locate, quantify and repair the leakage within the water distribution system.
- Complete Property Water Use Audits of existing municipal buildings and implement water efficiency retrofits and public demonstration projects.

Public Education

- Distribution of booklets, leaflets, and fact sheets at home shows and community and environmental events.
- Distribution of a water efficiency bulletin in the water bills.
- Displays at home shows, fairs and community events.
- Newspaper articles and advertisements.
- Develop and maintain a website to educate the public on water efficiency.
- Provide workshops and seminars to the public on water saving techniques both inside and outside the home.
- Provide water efficient demonstration gardens for the public to visit and learn.

Youth Education

- Develop and deliver a water efficiency education program based on the Ontario curriculum requirements.
- Continue annual participation in the Waterloo Wellington Children's Groundwater Festival.

Policy Based Recommendations (requiring Council approval)

- That the time based average day water reduction goals of the City's Water Supply Master Plan be formally endorsed as;

    - 10% reduction (5,300 m3/day) by 2010, based on 2006 average day water use;
    - 15% reduction (7,950 m3/day) by 2017, based on 2006 average day water use, and;
    - 20% reduction (10,600 m3/day) by 2025, based on 2006 average day water use;

- That the City adopt a water reduction philosophy of maintaining average day water production below the 2006 value (53,000 m3/day) for a 5 year period (2014).
- That the City of Guelph continue operation of the City's Outside Water Use Program in efforts to reduce impacts of Peak Seasonal Demands.
- That the City form a long standing Water Conservation and Efficiency Advisory Committee for purpose of ongoing public consultation throughout the implementation of the 2009 Water Conservation and Efficiency Strategy Update.
- that the City in partnership with the Region of Waterloo continue performance testing research of home water softener technologies and promote through a public educational program technology performance results and related environmental benefits of preferred technologies.
- That the City's Wastewater Effluent Re-use "Purple Pipe" Project and Class Environmental Assessment, as approved by Council through the 2008 Guelph Water/Wastewater Master Servicing Plan, evaluate the further potential for a communal wastewater effluent reuse system and design practices for customer serving of the effluent reuse source.
- That the City undertake a feasibility study to evaluate the best practices for multi-unit residential water metering and private servicing condition assessment requirements for current bulk metered multi-unit residential customers.
- That the City's Strategic Urban Forest Management Plan and the Natural Heritage Strategy define the appropriate means for protection and preservation of the City's urban forest in recognition of water conservation and storm water management benefits provided by the urban canopy.
- That staff undertake the immediate development of an enhanced public education water conservation program in 2009 subject to the availability of program funding.
- That staff initiate water loss mitigation activities in 2009 as outlined in the City's Water Loss Mitigation Strategy and investigate the potential for improved water pressure management in distribution system.
- That the City's Waterworks Department undertake a pilot study as part of the City's 2009 Water Loss Mitigation Strategy to evaluate the local implementation of Automated Metering Infrastructure (AMI) for customer water metering.
- That the City's Water/Wastewater Rate Review define customer billing policies for properties possessing Rain Water Harvesting Systems.
- That staff pursue external funding sources, and key partnerships, throughout implementation of the Water Conservation and Efficiency Strategy Update program recommendations.

The capital budget necessary to implement the ten year strategy is shown in the following Table 2.

Table 2: Ten Year Capital Budget

Ten Year Capital Plan	Total Cost	Total Accumlative Savings (Ml/day)	Cost per Litre
Single Family Detached Residential - Indoor Demand Measures	$ 7,579,870	3,448,980	$ 2.20
Single Family Detached Residential - Summer Demand Measures	$ 2,385,000	996,500	$ 2.39
Multi Family Residential	$ 1,413,316	589,770	$ 2.40
New Development Residential - Indoor Demand Measures	$ 2,272,500	583,650	$ 3.89
New Development Residential - Summer Demand Measures	$ 1,026,000	294,000	$ 3.49
Industrial/Commerical/Institutional	$ 1,987,900	1,135,700	$ 1.75
Distribution Leakage Reduction	$ 238,500	1,725,000	$ 0.14
Public Education	$ 1,420,000		
Youth Education	$ 1,030,000		
Other Municipal Initiatives	$ 940,000		
Total	$ 20,293,086	8,773,600	$ 2.31

Funding Allocation	Total
Approved DC Forecast	$ 2,759,958
Current Water Conservation Funding (Rate Base)	$ 5,835,115
Additional Funding (Rate Base)	$ 11,698,013
Total	$ 20,293,086

The $11,698,013 of additional required funding represents a 4.3% water rate increase in 2010.

The cost-effectiveness of a water efficiency strategy is evaluated by determining the cost per litre for the water saved. The cost per litre for water saved is then compared to the cost per litre to construct new water supply and wastewater infrastructure. If the cost per litre of saved water is less than the cost to construct new capacity, then the water efficiency strategy is deemed cost effective. It is important to note that the calculated cost relating to construction of an additional litre of water and wastewater capacity does not include the cost of debt financing of construction projects. It is also important to note, that this figure does not include the cost of additional infrastructure required for the distribution and conveyance of water and wastewater to and from newly serviced areas such as water/wastewater mains, pumping stations or system reservoirs.

In southern Ontario, the combined water and wastewater cost per litre per average day of additional capacity ranges from approximately $2.00 to $8.10. For the purpose of this financial analysis the combined water and wastewater cost of $4.00 per litre per average day of additional capacity was utilized.

Water savings generated from the efficiency strategy should be viewed in the same manner as constructing a new water treatment facility. If the City were to design and build a new facility to deliver 8.7 Ml/d, a budget for a maintenance program would be included to ensure that the facility continues to deliver 8.7 Ml d in the future. Water saved from a water efficiency strategy should be viewed similarly.

The strategy has been developed to save a specific amount of water and maintenance will continue to sustain the savings into the foreseeable future. The recommended maintenance budget is included in Table 3.

Table 3: Ten Year Maintenance Budget

Ten Year Maintenance Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Costs	Costs	Costs	Costs	Costs	Costs
Single Family Detached Residential - Indoor	$ 16,213	$ 16,426	$ 17,277	$ 17,916	$ 18,554	$ 19,193
Single Family Detached Residential - Summer Demand	$ -	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000
Multi Family Residential	$ 16,112	$ 16,223	$ 16,670	$ 17,005	$ 17,340	$ 17,674
Industrial/Commercial/Institutional	$ 12,061	$ 12,122	$ 22,867	$ 23,051	$ 28,104	$ 31,881
Distribution Leakage Reduction				$ 47,700	$ 47,700	$ 47,700
Total	$ 44,386	$ 62,771	$ 74,814	$ 123,671	$ 129,698	$ 134,448

Ten Year Maintenance Plan	Year 7	Year 8	Year 9	Year 10	Total
	Costs	Costs	Costs	Costs	
Single Family Detached Residential - Indoor	$ 19,831	$ 20,470	$ 21,108	$ 21,747	$ 188,733
Single Family Detached Residential - Summer Demand	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 162,000
Multi Family Residential	$ 18,009	$ 18,344	$ 18,679	$ 19,014	$ 175,070
Industrial/Commercial/Institutional	$ 31,907	$ 31,933	$ 31,959	$ 73,985	$ 299,870
Distribution Leakage Reduction	$ 47,700	$ 47,700	$ 47,700	$ 47,700	$ 333,900
Total	$ 135,447	$ 136,447	$ 137,446	$ 180,446	$ 1,159,573

It is important to have a monitoring and evaluation program to ensure that the water savings are achieved initially, and that those savings are sustained over time.

Table 4 below provides the monitoring and evaluation by year for the ten year strategy.

Table 4: Ten Year Monitoring and Evaluation Budget

Ten Year Monitoring and Evaluation Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Costs	Costs	Costs	Costs	Costs	Costs
Single Family Residential - Indoor	$ 345,000				$ 180,000	
Single Family Residential - Summer Demand	$ 45,000	$ 24,000	$ 24,000	$ 24,000	$ 98,460	
Multi Family Residential	$ 315,000				$ 120,000	
Industrial, Commercial and Institutional	$ 297,000				$ 37,700	
Total	$ 1,002,000	$ 24,000	$ 24,000	$ 24,000	$ 436,160	$ -

Ten Year Monitoring and Evaluation Plan	Year 7	Year 8	Year 9	Year 10	Total
	Costs	Costs	Costs	Costs	Costs
Single Family Residential - Indoor				$ 180,000	$ 705,000
Single Family Residential - Summer Demand				$ 98,460	$ 313,920
Multi Family Residential				$ 120,000	$ 555,000
Industrial, Commercial and Institutional				$ 37,700	$ 372,400
Total	$ -	$ -	$ -	$ 436,160	$ 1,946,320

The reduction of water-use through an efficiency program and the associated energy savings provides significant greenhouse gas reductions. With climate-change in mind, most municipalities have set their own greenhouse gas reduction targets.

Water efficiency can be a positive contributor to meeting those targets. The full implementation of the Water Conservation and Efficiency Strategy Update recommendations provides energy savings and greenhouse gas emissions reduction as indicated in Table 5 below.

Table 5: Estimated Energy Savings and Associated Greenhouse Gas Emission Reductions

	Water Savings per Year (m3/year)	Energy Savings per Year	CO2 Reductions per Year (tonnes/yr)
Overall Water Savings	3,202,364	2,348,934 KWh Electricity	728 tonnes
Low Flow Showerheads and Faucets	Included in above	684,216 m3 Natural Gas	1,294 tonnes
Pre-Rinse Spray Valves	Included in above	206,325 m3 Natural Gas	390 tonnes
Overall CO2 Reductions			2,412 tonnes

Electric savings 2,348,934 KWh for the City of Guelph represents a savings of $140,936 on its electric bill per year

The reduction of 2,412 tonnes in CO2 represents the equivalent of 438 cars removed from the road each year

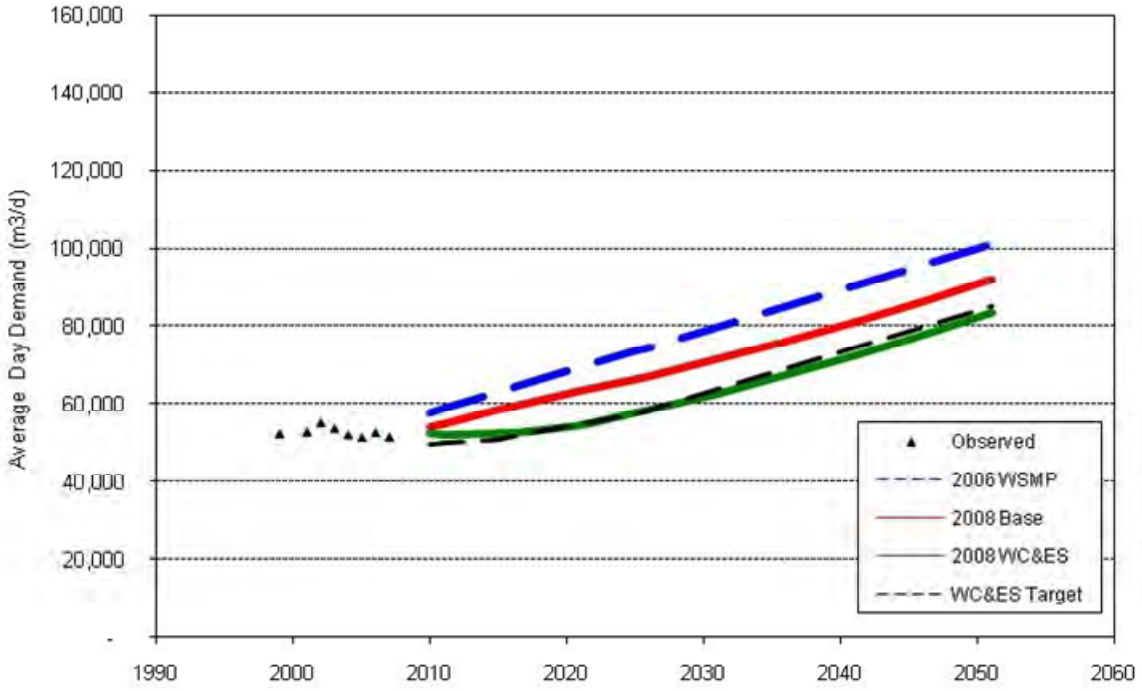
The final 2006 Water Supply Master Plan identified sustainable growth potential in the City contingent upon the success of aggressive water conservation and efficiency programs and identified the following overall targets in support of growth:

- 10% reduction in 2006 total average day water use by 2010
- 15% reduction in 2006 total average day water use by 2017
- 20% reduction in 2006 total average day water use by 2025

A major objective of this study was to determine if the above targets were achievable. It was determined in this study that the existing potential for water efficiency in Guelph is 13,661 m3/average day. This assumes a 100% participation rate and would require extensive funding. The potential analysis assumed decreasing residential single family demand from the current 230 Lcpd to 153 Lcpd.

Since 2006, the City has reported achieving 883 m3 per average day in water savings. The recommended ten year strategy contained in this report will provide an additional 8,774 m3 per average day by 2019. The combined savings represents a total of 9,657 m3 per average day water savings, significantly lower than the targets set in the 2006 Water Supply Master Plan. Not included in this estimate is the savings attributed to public and youth education. All would agree that education contributes to water conservation and efficiency but as discussed in the report, the exact savings are not possible to estimate or quantify.

Figure 1: City of Guelph Average Day Demand Projections



The recommended ten year strategy has been developed to take full advantage of the available market potential. Not all, but most of the inefficient toilets, clothes washers, showers and faucets will have been replaced by the end of the ten year period. Additional savings will be more difficult to generate with traditional water saving technologies and more emphasis will be placed on emerging technologies such as grey water reuse and rain water harvesting.

A summary of water efficiency programs being implemented by municipalities in Ontario can be found in Appendix A. City of Guelph's water conservation and efficiency strategy was developed with these neighbouring municipalities programs in mind, aligning the programming to leveraged known successes.

In addition to the recommended programs, it is anticipated that the City will pursue partnering with other municipalities and government agencies in the pursuit of research and development of new and emerging water efficiency technologies and practices.

Advancements to regulations, codes and standards could go a long way in ensuring water efficient housing and businesses in the future. Currently, the Ontario Building Code requires water efficient fixtures in all new construction; however the retrofit market can still install inefficient toilets. Associations such as the Ontario Water Works Association and the Canadian Water and Wastewater Association, in conjunction with Canadian municipalities are lobbying for the adoption of a regulation that would ban inefficient toilets from all applications. This would assist the municipalities in their pursuit of water efficiency and could reduce or eliminate the need for rebates.

As noted above, water efficiency generates a number of co-benefits including energy savings and reductions in greenhouse gas emissions. Electric and natural gas utilities, with the encouragement of regulators and governments, have been enthusiastic in their promotion of energy efficiency. These agencies are ideal partners for water efficiency programs. By pursuing these types of partnerships the cost of programs can be shared as well as the benefits.

The implementation of this strategy by the City of Guelph will ensure financially and environmentally sustainable water resources for today and future generations.

WATER CONSERVATION AND EFFICIENCY STRATEGY UPDATE

Public Information Centre #3

Wednesday, February 4th 2009

RMSi Resource Management Strategies Inc.
Protecting resources for future generations

Assignment

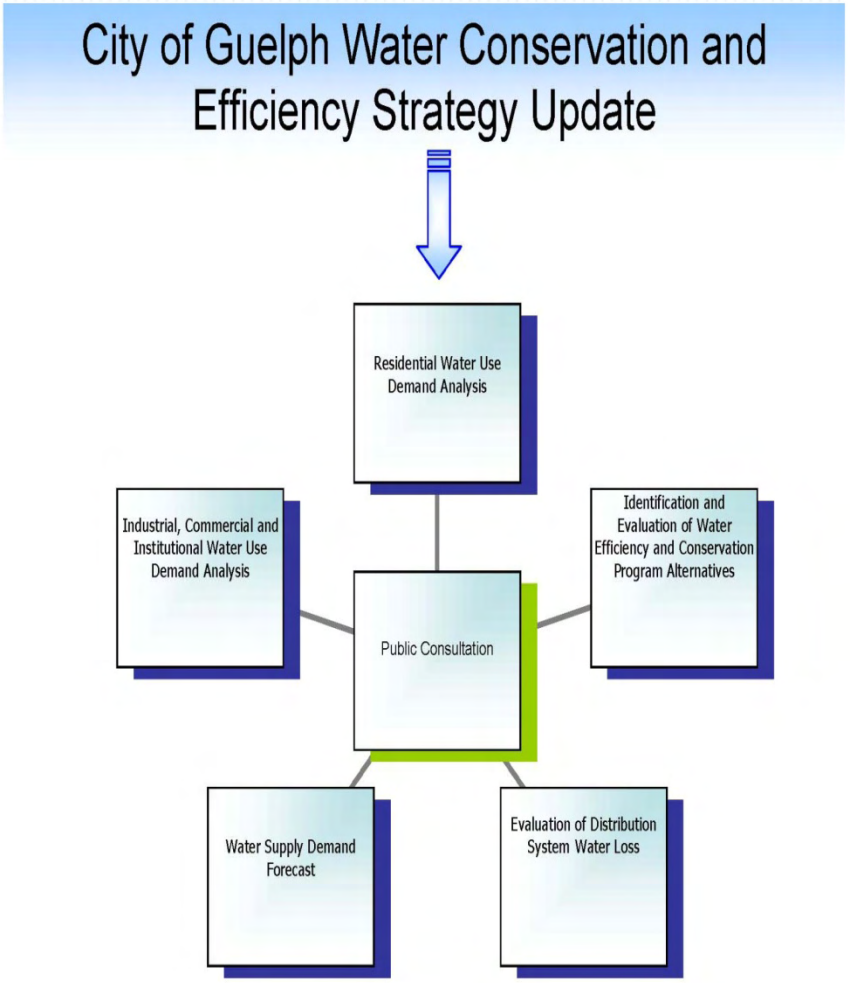
Develop a comprehensive community-based Water Conservation and Efficiency Strategy to best meet the time based water reduction goals of the Guelph Water Supply Master Plan within a 20 year planning horizon. Strategy to identify preferred program alternatives, associated water savings, program implementation forecasts, and associated resources required to implement program recommendations and sustain water savings.

Assignment Tasks:

1. Public Consultation
2. Res/ICI Water Demand Analysis
3. Water Loss Analysis
4. Water Loss Mitigation Strategy
5. Update of Water Demand Forecasts
6. Identification/Evaluation of Water Conservation Program Alternatives
7. Strategy Implementation Plan
8. Document in Water Conservation and Efficiency Strategy Report

Public Consultation

- Public Consultation key to project success. Consultation featured:
  - Establishment of Public Advisory Committee
  - Completion of Phone Surveys and Focus Groups
  - Public Information Centres (3)



City of Guelph Conservation Goals

Local Conservation Drivers

- Finite groundwater source
- Projected future growth (increase of 51,000 persons by 2031)
- Assimilate capacity thresholds of Speed River for wastewater discharges

City of Guelph Water Conservation and Efficiency Targets:

Strategic Plan Goal 6 - Leader in conservation and resource protection/enhancement:

6.5 - Use less energy and water per capita than any comparable Canadian City

2006 Water Supply Master Plan Total Average Day Water Use Reduction Targets:

- 10% reduction in 2006 average day water use by 2010
- 15% reduction in 2006 average day water use by 2017
- 20% reduction in 2006 average day water use by 2025

Water Conservation Program Savings Overview

Conservation Program - Average Day Savings:

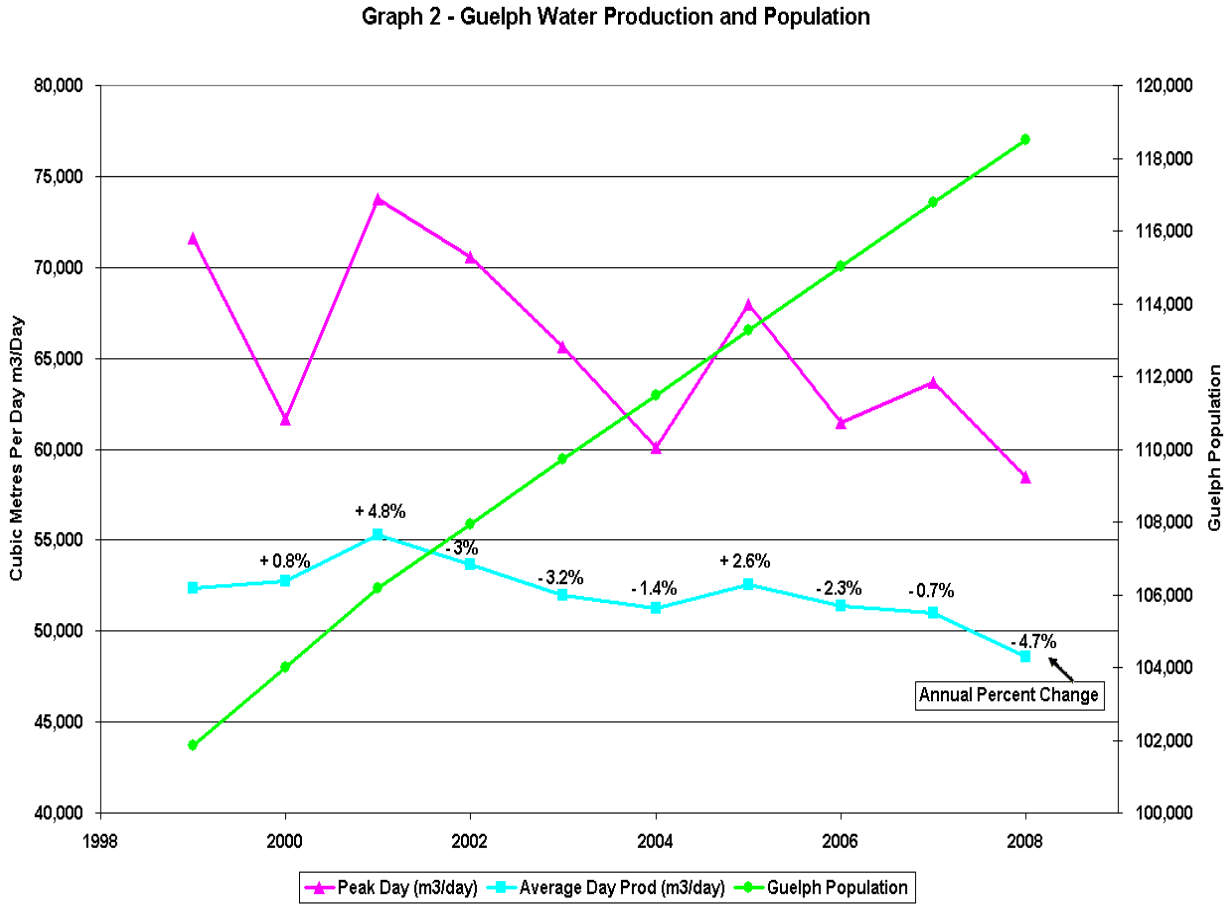
Water Conservation Savings by Year 2003 to 2008				
Year	Program	Savings (m3/day)	Savings (m3/yr)	Total Annual Savings (m3/yr)
2003	Royal Flush	80.0	29,200.0	29,200.0
2004	Royal Flush	80.0	29,200.0	29,200.0
2005	Royal Flush	80.0	29,200.0	29,200.0
2006	Royal Flush	80.0	29,200.0	29,200.0
2007	Royal Flush	81.9	29,893.5	
2007	ICI Capacity Buyback - U of G	312.0	113,880.0	143,773.5
2008	Royal Flush	189.1	69,021.5	
2008	ICI Capacity Buyback - Cargill	190.0	69,350.0	
2008	Smart Wash Program	30.0	10,950.0	149,321.5
Total Savings		**1,123.0**		**409,895.0**

Peak Day/Season Savings – Outside Water Use Program:

-Utility peak day reduced by 13,000m3/day since 1999

-Peak Season Average Daily pumpage reduced by 3,800 m3/day since 2000

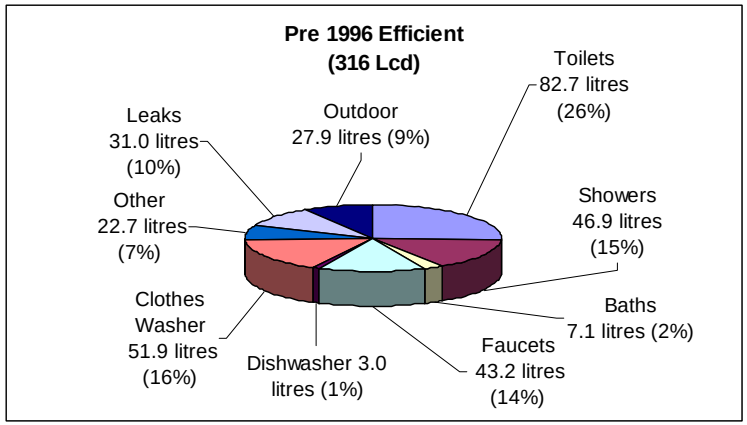
City of Guelph Annual Water Production vs. Population Growth

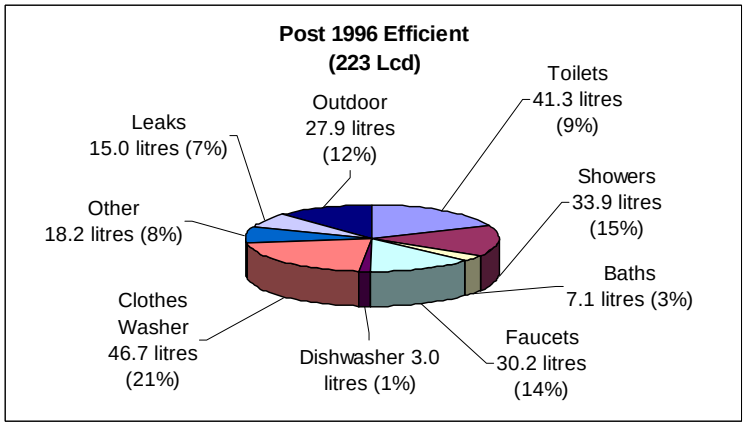


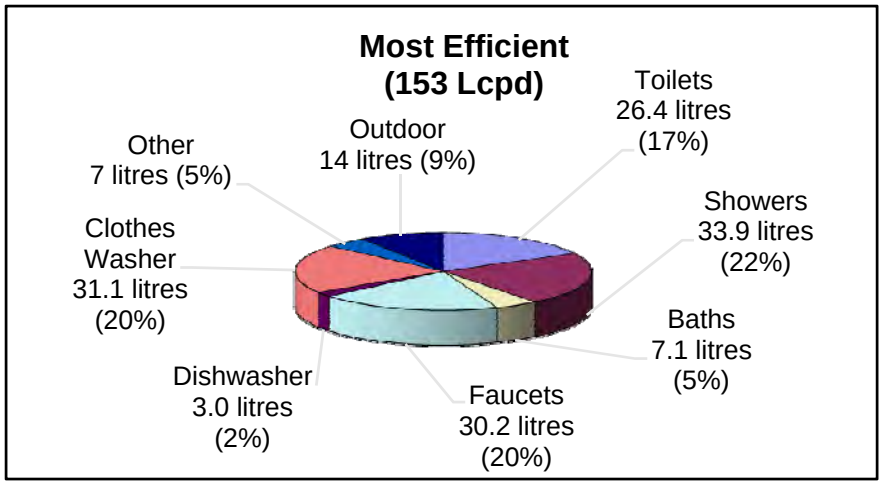
Water Use Demand Analysis Summary

Sector	2007 Billed(m^3)	% of Total Billed	Population	LCPD
Single Family	7,967,457	51%	94,745	230
Multi Family	1,135,560	7%	20,295	153
Total Residential	9,103,017			
Industrial, Commercial, Institutional (ICI)	6,660,534	42%		
Total 2007 Billed Consumption	15,763,551			

Residential Water Use Demand Analysis

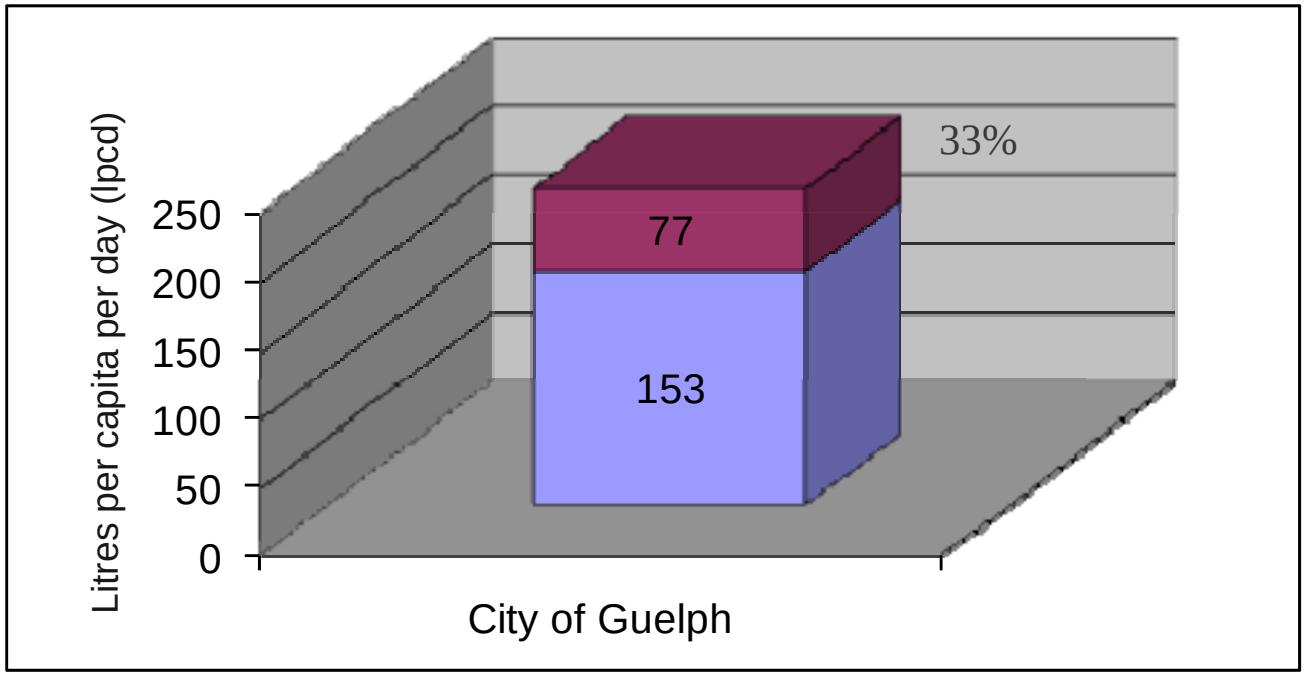






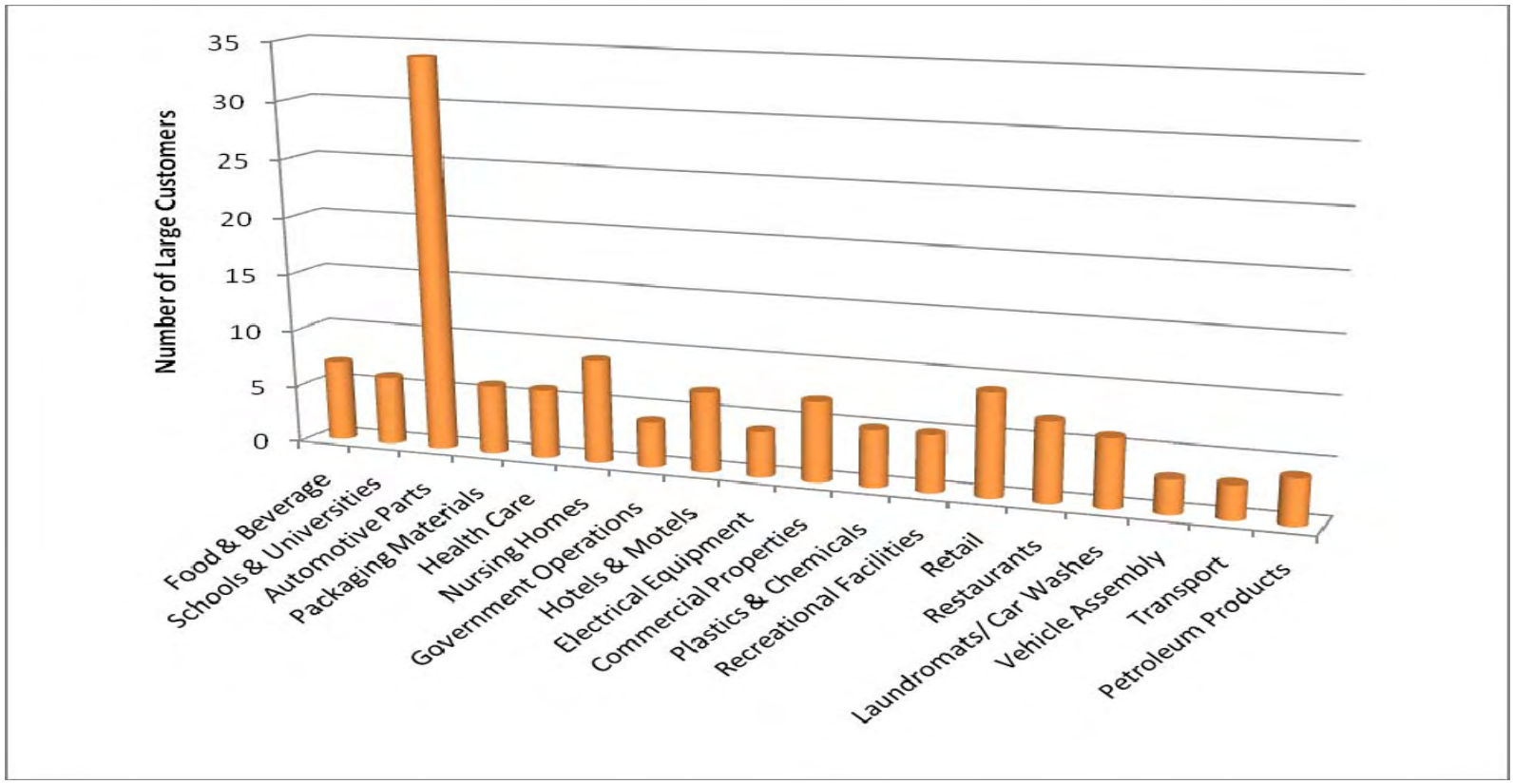
Residential Water Use Demand Analysis

Detached Single Family Residential Water Efficiency Potential



City of Guelph Single Family Residential Avg Water Use: 230 lpcd
Most Efficient Model Single Family Residential Avg Water Use: 153 lpcd

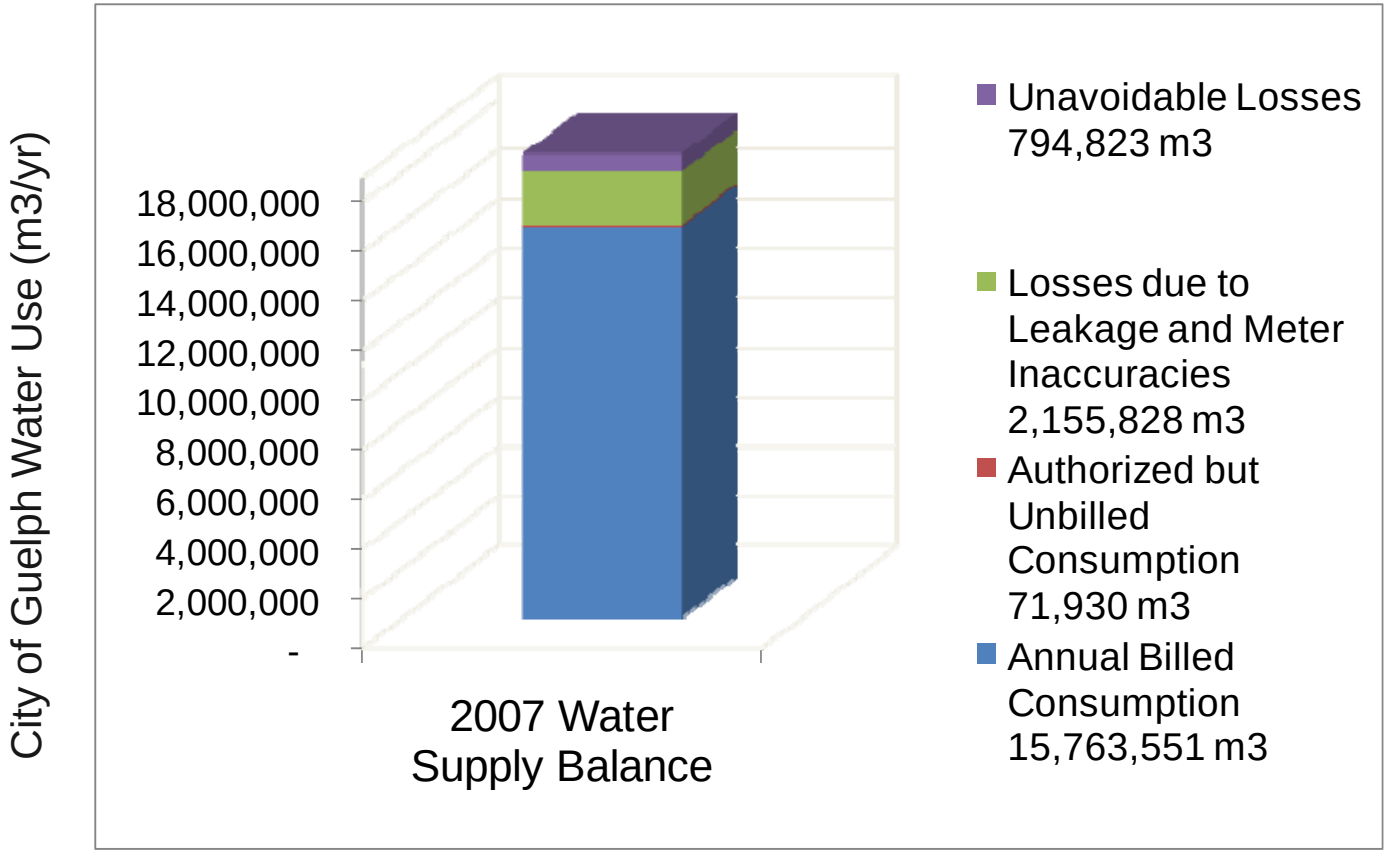
Industrial, Commercial, Institutional (ICI) Analysis



Industrial, Commercial, Institutional (ICI) Analysis

- Largest 133 ICI customers used 4,766,000 m^3 in 2007
- 29,000 people employed in these organizations
- Process water use estimate 4,198,000 m^3
- Domestic water use estimate 360,000 m^3 Product water use estimate 208,000 m^3

AWWA / IWA Water Audit and Water Balance Results



Overall Potential for Water Efficiency

Residential Single Family Detached	
Current Demand (2007) lcpd	230
Potential Demand (end use studies) lcpd	153
Potential Savings lcpd	77
2007 Population	94,745
Potential Single Family Savings	2,662,808 m3/year 7,295 m3/day

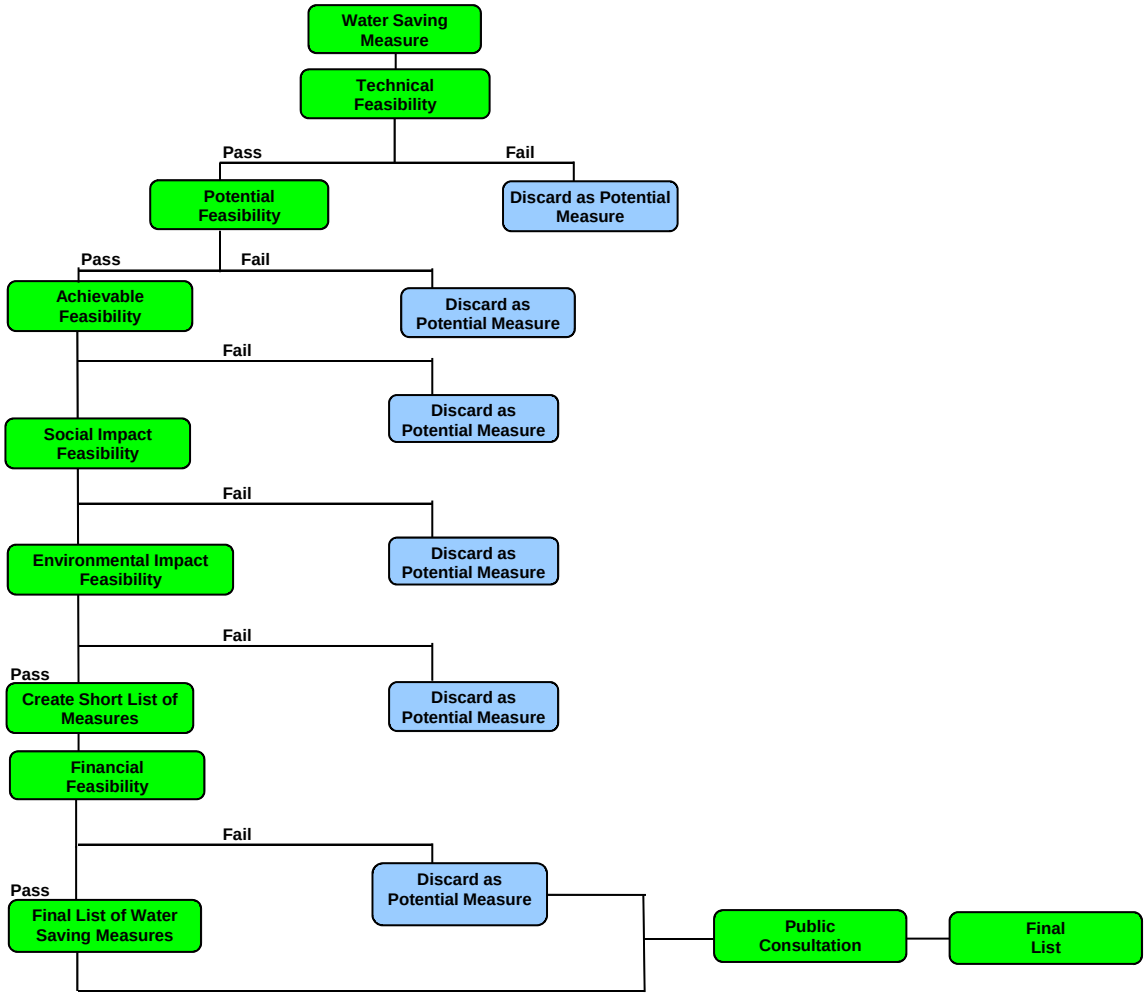
Industrial ,Commercial, and Institutional	
Current Demand (2007) m3	6,660,534
Estimated Savings 15% per Analysis	990,080
Potential ICI Savings	990,080 m3/year 2,737 m3/day

Distribution Leakage Reduction	
Active Leakage Reduction per Analysis	985,500 m3/year 2,700 m3/day
Background Leakage Reduction Per Analysis	109,500 m3/year 300 m3/day
Total Potential Leakage Savings	1,095,000 m3/year 3,000 m3/day

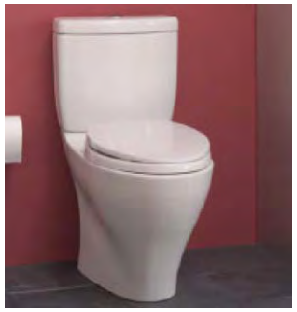
Residential Multi-family	
Current Demand (2007) lcpd	153
Estimated Savings 22% per Analysis	34
2007 Population	20,295
Potential Multi-family Savings	249,342 m3/year 683.1 m3/day

Total Potential Water Efficiency Savings	
Potential Single Family Savings	2,662,808 m3/year 7,295 m3/day
Potential Multi-family Savings	249,342 m3/year 683.1 m3/day
Potential ICI Savings	990,080 m3/year 2,737 m3/day
Total Potential Water Efficiency Savings	3,911,231 m3/year 10,716 m3/day
Total Potential Water Efficiency and Leakage Savings	**5,006,231 m3/year 13,716 m3/day**
Percentage Saving of 2006 Actual Demand	27% m3/year 27% m3/day

Screening of Measures



Financial Screening for Measures



Cost of New Water Supply vs. **Cost of Reclaimed Supply**

Cost of construction of new water supply and wastewater treatment infrastructure:
$3.00 to $8.00 /litre capacity/ day

Cost of Water and Wastewater capacity reclaimed through water conservation and efficiency program resources:
<$4.00 /litre capacity/day

Water Infrastructure Construction Costs

WSMP New Water Supply Alternative	Cost Range ($/cubic meter supply)
Water Reclaimed through Conservation	$57 - 1095
Construction of New Local Supply	$795 - $3000*
Construction of Great Lakes Pipeline	$3700*

*Construction costs of complementary Wastewater Treatment Infrastructure not included

Key Findings

- Gross water demand has declined 17% from 444 lcpd in 1999 to 370 lcd in 2007
- City's population increased by 14.6% from 101,857 in 1999 to 116,766 in 2007
- Residential single family water demand was 230 lcpd in 2007, significantly lower than the national average of 335 lcd
- Residential multi family water demand was 153 lcpd

Key Findings, cont.

- Only 5% of 133 industrial, commercial and institutional customers consume 80% of the overall ICI water demand
- The Infrastructure Leakage Index (ILI) was 2.94, placing the City in a Performance Category B with the potential for some improvement
- The City has one of the lowest peaking factors in Ontario at approximately 1.30
- The City is currently saving 1,123,000 litres per average day due to its conservation initatives which commenced in 2003

Recommended Water Conservation and Efficiency Strategy Components

Single Family - Indoor		Number of Rebates or Participants
Rebates	ULF 6 Litre Flush ($60)	828
Rebates	HET Toilets ($75)	311
Rebates	Dual Flush Toilets ($75)	932
Rebates	Clothes Washer ($80)	1,090
Rebates	Humidifier ($75)	928
Rebates	Floor Drain ($60)	1,000
Rebates	Grey Water ($1,000)	10
Rebates	Rain Water ($2,000)	10
Installation	Low Flow Showerheads	693
Installation	Kitchen Faucets	58
Installation	Leakage Repair	11

Single Family - Summer Demand		Number of Rebates or Participants
Rebates	Watering Timers ($20)	500
Other	W.E. Landscape Visits	1,000
Other	Rain Barrels	650

Recommended Water Conservation and Efficiency Strategy Components

Multi- Family Highrise		Number of Rebates or Participants
Rebates	ULF 6 Litre Flush ($60)	202
Rebates	HET Toilets ($75)	113
Rebates	Dual Flush Toilets ($75)	338
Rebates	Clothes Washer ($200)	60
Installation	Low Flow Showerheads	224
Installation	Kitchen Faucets	28
Installation	Leakage Repair	5

Recommended Water Conservation and Efficiency Strategy Components

Residential New Development - Indoor		Number of Rebates or Participants
Rebates	HET Toilets ($10)	228
Rebates	Dual Flush Toilets ($10)	675
Rebates	Clothes Washer ($80)	225
Rebates	Humidifier ($75)	270
Rebates	Floor Drain ($60)	270
Rebates	Grey Water ($1,000)	10
Rebates	Rain Water ($2,000)	10
Rebates	Low Flow Showerheads ($10)	452
Rebates	Kitchen Faucets ($5)	450

Residential New Development - Summer Demand		Number of Rebates or Participants
Rebates	W.E. Landscaping ($200)	300
Rebates	Watering Timers ($20)	300

Recommended Water Conservation and Efficiency Strategy Components

Industrial/Commercial/Institutional		Number of Rebates or Participants
Rebates	ULF 6 Litre Flush ($60)	232
Rebates	HET Toilets ($75)	88
Rebates	Dual Flush Toilets ($75)	144
Rebates	Clothes Washer ($200)	30
Installation	Pre-Rinse Spray Valves	23
Other	ICI Audit and Capacity Buyback	2

Distribution Leakage Reduction		Number of Rebates or Participants
Other	DMAs	5

Education
Public Education
Youth Education

Other Municipal Initiatives	
Study	WC&ES Updates
Study	Multi-Res Metering Study
Demonstrations	Municipal Building Demonstrations

Ten Year Capital Plan

Ten Year Capital Plan	Total Cost	Total Accumlative Savings (Ml/day)	Cost per Litre
Single Family Detached Residential - Indoor Demand Measures	$ 7,579,870	3,448,980	$ 2.20
Single Family Detached Residential - Summer Demand Measures	$ 2,385,000	996,500	$ 2.39
Multi Family Residential	$ 1,413,316	589,770	$ 2.40
New Development Residential - Indoor Demand Measures	$ 2,272,500	583,650	$ 3.89
New Development Residential - Summer Demand Measures	$ 1,026,000	294,000	$ 3.49
Industrial/Commerical/Institutional	$ 1,987,900	1,135,700	$ 1.75
Distribution Leakage Reduction	$ 238,500	1,725,000	$ 0.14
Public Education	$ 1,420,000		
Youth Education	$ 1,030,000		
Other Municipal Initiatives	$ 940,000		
Total	$ 20,293,086	8,773,600	$ 2.31

Funding Allocation	Total
Approved DC Forecast	$ 2,759,958
Current Water Conservation Funding (Rate Base)	$ 5,835,115
Additional Funding (Rate Base)	$ 11,698,013
Total	$ 20,293,086

Note: $11,698,013 of additional funding represents an 4.3% water rate increase in 2010.

Policy Based Recommendations

- That the time based average day water reduction goals of the City's Water Supply Master Plan be formally endorsed as;
  - 10% reduction (5,300 m3/day) by 2010, based on 2006 average day water use;
  - 15% reduction (7,950 m3/day) by 2017, based on 2006 average day water use, and;
  - 20% reduction (10,600 m3/day) by 2025, based on 2006 average day water use;
- That the City adopt a water reduction philosophy of maintaining average day water production below the 2006 value (53,000 m3/day) for a 5 year period (2014).

Policy Based Recommendations

- That the City of Guelph continue operation of the City's Outside Water Use Program in efforts to reduce impacts of Peak Seasonal Demands.

- That the City form a long standing Water Conservation and Efficiency Advisory Committee for purpose of ongoing public consultation throughout the implementation of the 2009 Water Conservation and Efficiency Strategy Update.

- That the City in partnership with the Region of Waterloo continue performance testing research of home water softener technologies and promote through a public educational program technology performance results and related environmental benefits of preferred technologies.

Policy Based Recommendations

- That the City's Wastewater Effluent Re-use "Purple Pipe" Project and Class Environmental Assessment, as approved by Council through the 2008 Guelph Water/Wastewater Master Servicing Plan, evaluate the further potential for a communal wastewater effluent reuse system and design practices for customer serving of the effluent reuse source.

- That the City undertake a feasibility study to evaluate the best practices for multi-unit residential water metering and private servicing condition assessment requirements for current bulk metered multi-unit residential customers.

Policy Based Recommendations

- That the City's Strategic Urban Forest Management Plan and the Natural Heritage Strategy define the appropriate means for protection and preservation of the City's urban forest in recognition of water conservation and storm water management benefits provided by the urban canopy.

- That staff undertake the immediate development of an enhanced public education water conservation program in 2009 subject to the availability of program funding.

- That staff initiate water loss mitigation activities in 2009 as outlined in the City's Water Loss Mitigation Strategy and investigate the potential for improved water pressure management in distribution system.

Policy Based Recommendations

- That the City's Waterworks Department undertake a pilot study as part of the City's 2009 Water Loss Mitigation Strategy to evaluate the local implementation of Automated Metering Infrastructure (AMI) for customer water metering.

- That the City's Water/Wastewater Rate Review define customer billing policies for properties possessing Rain Water Harvesting Systems.

- and that staff pursue external funding sources, and key partnerships, throughout implementation of the Water Conservation and Efficiency Strategy Update program recommendations

Ten Year Maintenance Plan

Ten Year Maintenance Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Costs	Costs	Costs	Costs	Costs	Costs
Single Family Detached Residential - Indoor	$ 16,213	$ 16,426	$ 17,277	$ 17,916	$ 18,554	$ 19,193
Single Family Detached Residential - Outdoor	$ -	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000
Multi Family Residential	$ 16,112	$ 16,223	$ 16,670	$ 17,005	$ 17,340	$ 17,674
Industrial/Commercial/Institutional	$ 12,061	$ 12,122	$ 22,867	$ 23,051	$ 28,104	$ 31,881
Distribution Leakage Reduction				$ 47,700	$ 47,700	$ 47,700
Total	$ 44,386	$ 62,771	$ 74,814	$ 123,671	$ 129,698	$ 134,448

Ten Year Maintenance Plan	Year 7	Year 8	Year 9	Year 10	Total
	Costs	Costs	Costs	Costs	
Single Family Detached Residential - Indoor	$ 19,831	$ 20,470	$ 21,108	$ 21,747	$ 188,733
Single Family Detached Residential - Outdoor	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 162,000
Multi Family Residential	$ 18,009	$ 18,344	$ 18,679	$ 19,014	$ 175,070
Industrial/Commercial/Institutional	$ 31,907	$ 31,933	$ 31,959	$ 73,985	$ 299,870
Distribution Leakage Reduction	$ 47,700	$ 47,700	$ 47,700	$ 47,700	$ 333,900
Total	$ 135,447	$ 136,447	$ 137,446	$ 180,446	$ 1,159,573

Ten Year Monitoring and Evaluation Plan

Ten Year Monitoring and Evaluation Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Costs	Costs	Costs	Costs	Costs	Costs
Single Family Residential - Indoor	$ 345,000				$ 180,000	
Single Family Residential - Outdoor	$ 45,000	$ 24,000	$ 24,000	$ 24,000	$ 98,460	
Multi Family Residential	$ 315,000				$ 120,000	
Industrial, Commercial and Institutional	$ 297,000				$ 37,700	
Total	$ 1,002,000	$ 24,000	$ 24,000	$ 24,000	$ 436,160	$ -

Ten Year Monitoring and Evaluation Plan	Year 7	Year 8	Year 9	Year 10	Total
	Costs	Costs	Costs	Costs	Costs
Single Family Residential - Indoor				$ 180,000	$ 705,000
Single Family Residential - Outdoor				$ 98,460	$ 313,920
Multi Family Residential				$ 120,000	$ 555,000
Industrial, Commercial and Institutional				$ 37,700	$ 372,400
Total	$ -	$ -	$ -	$ 436,160	$ 1,946,320

Energy Savings and Greenhouse Gas Reductions

	Water Savings per Year (m3/year)	Energy Savings per Year	CO2 Reductions per Year (tonnes/yr)
Overall Water Savings	3,202,364	2,348,934 KWh Electricity	728 tonnes
Low Flow Showerheads and Faucets	Included in above	684,216 m3 Natural Gas	1,294 tonnes
Pre-Rinse Spray Valves	Included in above	206,325 m3 Natural Gas	390 tonnes
Overall CO2 Reductions			2,412 tonnes

Electric savings 2,348,934 KWh for the City of Guelph represents a savings of $140,936 on its electric bill per year

The reduction of 2,412 tonnes in CO2 represents the equivalent of 438 cars removed from the road each year

Comparison to Targets in Water Supply Master Plan

Targets from Water Supply Master Plan – 2006

- 10% reduction in 2006 average day water use by 2010
- 15% reduction in 2006 average day water use by 2017
- 20% reduction in 2006 average day water use by 2025

Overall Potential for Water Efficiency

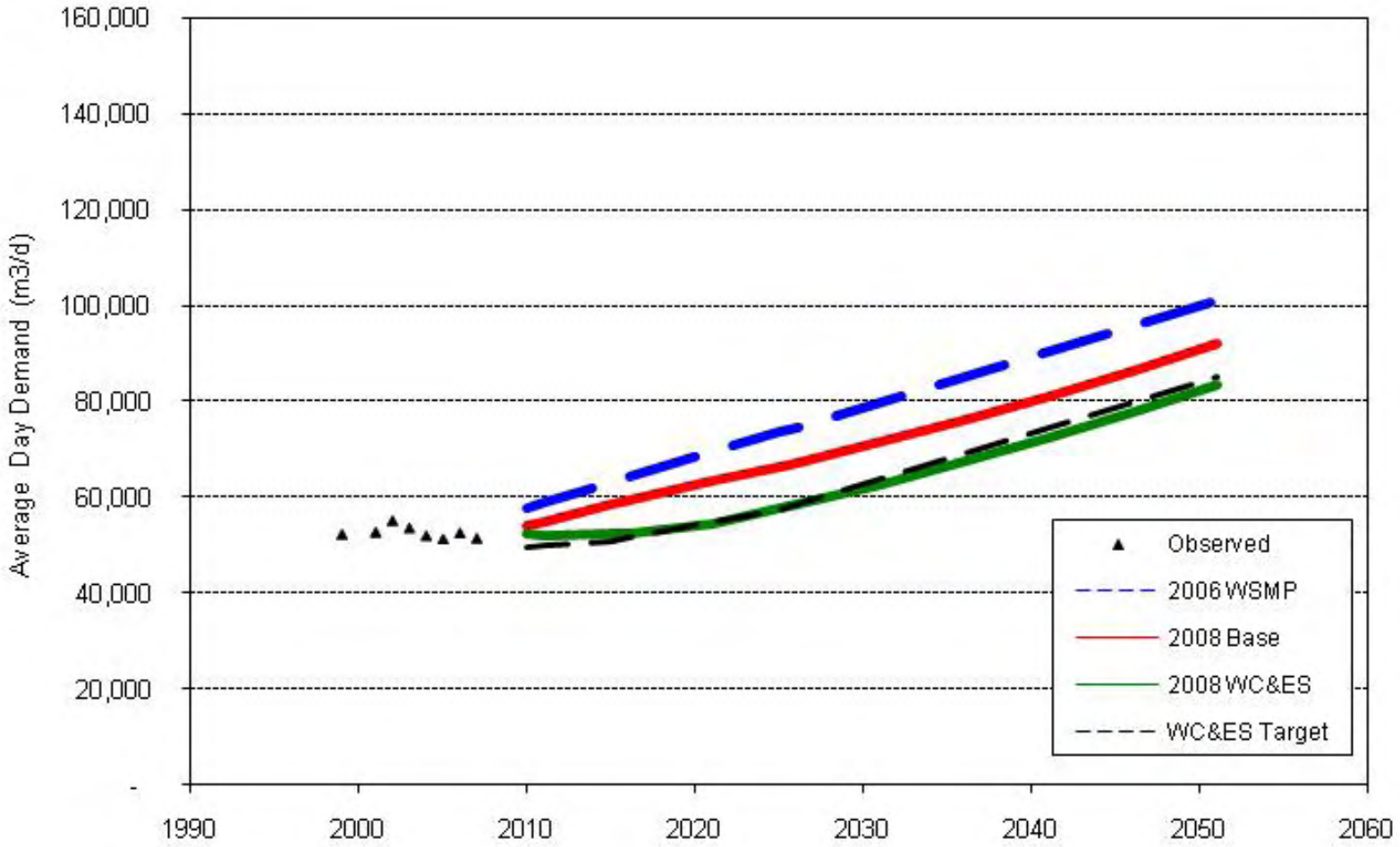
- 13,661 m3 per average day

Overall Achievable Water Efficiency by 2019

- 9,657 m3 per average day

Overall achievable water efficiency of 9,657 m3 includes reported water savings of 883 m3 per average day since 2006.

Average Day Water Demand Projection



Water Conservation and Efficiency Strategy

- Takes full advantage of existing market potential
- Not all, but most of the inefficient appliances and fixtures will have been replaced by the end of the ten year plan
- Additional savings beyond this plan will come from emerging technologies such as grey water reuse and rain water harvesting
- Conservation Strategy to be revisited at 5 year intervals to review new technologies/policies and resources and revise strategy accordingly.

Moving Forward and Next Steps

Public Consultation Program

- Post Draft WC&E Strategy Update report on webpage for public reference and comment – Feb 13th 2009

Anticipated Project Timelines

- Submit Final Strategy – February 11th 2009
- Water Conservation and Efficiency Strategy Update Guelph City Council Workshop – February 25, 2009
- Presentation of Final Report to City Council – March 2009

City of Guelph

Water Conservation and Efficiency Strategy Update

Public Information Centre #3

February 4th 2009

Minutes

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1.
   a. Refer to page 1 – recommendations in 1999 Water Conservation & Efficiency Study – 10th bullet – 'That staff be directed to encourage owners of private distribution system to minimize their 'unaccounted for water (UFW)'. There seems to be no comment in the Draft Executive summary in respect to how this recommendation was achieved or addressed!
   b. How many private distribution systems are there in the city of Guelph? Do these systems each operate under and MOE Permit to Take Water?
   c. Does the City have an accurate figure of total water taking permitted for these private systems?
   d. It appears that the original recommendation has not been incorporated into the 'Policy based Recommendations (Requiring Council Approval)' See page 7 – Why??? This needs to be included!

Additional Comments:

1. Page 6 – Industrial/Commercial/Institutional Measures: There seems to be no recommended measures for large industrial users –possibly just toilets – employee washrooms
2. I have a problem with the finalized 2006 Water Supply Master Plan identifying 'sustainable growth potential' upon the success of aggressive water conservation & efficiency programs should not be to allow even more growth – what happens if a catastrophic event occurs such as widespread water/aquifer contamination breeches to the groundwater aquifers - there would be nothing to fall back on to meet demand of a city that has grown beyond its capacity supply water to its residents. HOW MUCH CAN GUELPH GROW? MORE GROWTH MEANS MORE LOW FLUSH TOILETS, CLOTHES WASHERS, LOW FLOW SHOWERHEADS ON THE SAME AQUIFER
3. What is the level of danger for grey water systems to contaminate drinking water in water pipes – backflows etc.
4. Do Lime Quarry –
   a. Is the City of Guelph a full participant in current discussions going on between the MNR/licensing Ministry) and the MOE in respect to the breech of the aquifer which apparently occurred in the summer of2008?

b. What is the total amount of water being taken at the Quarry under MOE Permit to Take Water?
c. How much water is leaking or has leaked from the breech of the aquifer? Where is this water being stored or is it being flushed into the Speed River?
d. The city of Guelph should be using current legislation to protect/conserve its water supply – see Groundwater Ontario Website – 'Aggregates & the Law' * The Aggregate Resources Act does not take precedence over other acts that are in place to protect water resources

5. Is the City of Guelph planning to amend its Official Plan and add the 'Water Conservation and Efficiency Strategy' in compliance with the Provincial Policy on Water – see provincial water policy statement/PPS) under Section 3 of the Planning Act?

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. It is critical that a strong protective tree by-law be included in the water policy. Trees prevent run-off allowing aquifers to be recharged and soil to absorb moisture (see GRCA Watershed Forest Plan, Chat 3.2 Urban Forests)

Additional Comments:

1. I support water conservation measures and plan to maintain water use (total) at 2008 levels. Water usage will be fixed regardless of increase in population.

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. Crucial to water conservation are forest, including urban forests. There should be a measure to protect nature & expand forests within the city limits. The GRCA has a plan for watershed forests.

Additional Comments:

2. I support fixed annual limits on water use and taking.

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. Yes – Composting Toilets & Green Roofs. MOST OF ALL – Source Water Protection

Additional Comments:

2. Your plan is good in general, thank you.

3. We need a strong & far reaching source water protection plan and habitat + bio-diversity will get protected too.
4. Where is your natural heritage and green belt plan?
5. Love the grey water initiating
6. Please look into phyto-remediation (ocean arks/living machines) for wastewater treatment. Factories could use this to clean their own dirty water and then re-use it
7. More trees in Guelph.

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. Importance of tree and forest protection through the Natural Heritage Strategy (the City needs to pass this policy and act on it)

Additional Comments:

1. Need to recognize importance of water quality
2. What about protecting the moraine and ground water recharge zones, especially in the south of the city (very important to quality & quantity of our groundwater supply)
3. Concentrate on non-technical fixes such as lowering demand & preserving ground water recharge sites
4. South end developments such as residential subdivisions, box stores and business parks should be eliminated as part of this plan. The conservation of water quality & quantity at the source goes hand in hand with conservation

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In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. I am glad to see the recognition that urban forest in critical to water conservation + strategic planning for the future water sources + quality.

Additional Comments:

1. We need to leave a fixed target for 15 years so we have stable commitment to water conservation.
2. With much more public education which could be done with the help of a forester/forestry department.
3. Our trees are our city's assets + these assets appreciate over time. They must be protected + tied to water

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In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

None

Additional Comments:

1. I am concerned that only municipal consideration is given to the benefits of trees and other national landscape (wetlands, etc.) to our increasing [sic] lee retention of water that falls as rain. This could provide a positive impact on recharging aquifers.

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. I really appreciated the mention of importance of the urban (and rural by the way) tree canopy

Additional Comments:

Why doesn't Guelph have a Natural Heritage Strategy? If we are going to develop wisely + protect Guelph's watershed then it needs to be put into policy, yes?

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. Check out the 'purple pipe' policies + infrastructure that has been in use for 30 years in Irvine, California (Irvine Water District) for grey water + effluent re-use.

Additional Comments:

1. Allow some development in water recharge areas on the morine to the south of the City – that is <u>not</u> high density – such as estate lots that allow for a large percentage of lot areas to be open to the sky + therefore allow water recharge, rather than covering most of the lot with buildings + parking lots that direct water to the storm sewers.

In review of the suite of water efficiency or conservation policies/measures recommended through the study do you feel there are any potential conservation policies/measures that have been missed?

1. Yes, no garden water except new plantings (new trees, xeriscape planting)
2. Xeriscape everywhere including city gardens
3. Have forester assess trees – re: trimming, re: cutting

Additional Comments:

1. After Christmas a mature maple with no dead was cut down
2. Plant more trees