

For Information

DATE: March 26, 2009

SUBJECT: **WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED
WATER EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

FROM: Dan Labrecque, Commissioner of Environment, Transportation
and Planning Services

OBJECTIVE

The objective of this report is to update Regional Council on 2008 implemented water efficiency measures, and examine the future direction of water conservation initiatives within Peel.

REPORT HIGHLIGHTS

- On October 23, 2008, Regional Council approved an update report on 2007 implemented water efficiency measures. These measures contributed to an average annual day demand savings of 1.59 million litres of water per day.
- In 2008, six water efficiency measures including the Residential Toilet Replacement Program, Peel Living Water Efficiency Retrofit Project, Outdoor Lawn and Garden Consultation Program, Pre-Rinse Spray Valve Replacement Program, Industrial, Commercial and Institutional Indoor Water Audit Program, and Toilet Replacement Program for Businesses contributed to an average annual day demand savings of 2.86 million litres of water per day.

DISCUSSION**1. Background**

On October 23, 2008, Regional Council approved a report of the Commissioner of Environment Transportation and Planning Services, dated September 15, 2008, titled "Water Efficiency Plan: Update on 2007 & 2008 to Date Implemented Water Efficiency Measures" in order to approve the continuation of development and implementation of the Region's Water Efficiency Plan in accordance with Resolution 2002-1238. The 2007 water efficiency measures contributed to an average annual day demand (AADD) savings of 1.59 million litres of water.

With the approval of the Water Efficiency Plan (WEP) in 2005, staff recommended an annual report be submitted to Regional Council on the progress of implemented water efficiency programs and water savings related to the WEP. This report highlights the achievements in 2008 and includes initiatives currently in progress and scheduled for 2009.

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

2. Implemented Water Efficiency Measures for 2008 – Residential Programs

a) Residential Toilet Replacement Program

i) 2008 Successes

Water used for flushing toilets accounts for approximately 30 per cent of residential indoor water demands. Water used for flushing can be decreased by more than half by replacing inefficient toilets (13 or 16 litres per flush) with new more efficient toilets that flush with 6 litres of water or less.

The Residential Toilet Replacement Program incents residents to make water efficient toilets their fixture of choice by offering rebates of \$60 to \$100 on *Peel Approved* toilet models. These rebates help to make water efficient toilets more economically appealing than their inefficient counterparts by offsetting some of the additional cost.

In 2008 the Region issued 21,026 rebates to residents and property owners of single-family and multi-family dwellings. This represents an 84% increase in rebates over 2007 totals and translates into an average annual day savings of 2.19 million litres of water. The increase in rebates is partly due to increased program awareness, and the growing number of water efficient toilets available in the marketplace. Of the toilets rebated in 2008, 2931 toilets were rebated as a result of three weekend in-store Instant Rebate Events held at big box stores across Peel. The three instant rebate events were extremely well received by residents as the events provided a quick and easy way for residents to purchase water efficient toilets and receive their rebates. These events also provided an opportunity for Water Smart Peel to educate the community about the importance of household water efficiency and answer questions regarding the performance and testing of low flow fixtures.

ii) 2009 Initiatives

A clear shift towards water efficient 6L toilets has occurred in the marketplace. Since the inception of the Residential Toilet Replacement Program, the number of toilets on the *Peel-Approved* list has increased.

Currently the municipally-approved toilet list consists of water efficient toilet models that have passed the Maximum Performance (MaP) testing program. These toilets have a maximum flush volume of 6L and flush a minimum of 250 grams of test material. In order to push the market and consumer choice towards more efficient toilets such as High Efficiency Toilets (HET) that flush with 4.8 L or less and more sustainably performing models, a more strict set of guidelines will be incorporated into the Toilet Replacement Program as of April 1, 2009. These guidelines, known as the Uniform North American Requirements (UNAR), incorporate elements of MaP testing in addition to restricting maximum flush volumes, requiring chemical-resistant trim components, and successful clearance of 350 grams of test media.

It is the intent of Water Smart Peel that the Uniform North American Requirements (UNAR) act as a transition towards the adoption of the U.S. Environmental Protection Agency's WaterSense standards by mid 2010. The WaterSense

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER
EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

qualification builds upon UNAR standards by including only high-efficiency toilets with a maximum allowable flush volume of 4.8 litres.

These municipally-approved toilet list changes are a collaboration of six local municipalities and have been coordinated to reduce customer and retailer confusion and create consistency in program delivery across municipal borders.

iii) Banning of Non-Efficient Toilet Models

Since 1996, the Ontario Building Code has mandated the use of low flush (6 L) toilet models in all new construction. However there are no restrictions on the sale of non-efficient toilet models (i.e. flush with 13 L or more) for replacement or renovation purposes.

The Canadian Advisory Council on Plumbing (CACP) and Canadian Institute of Plumbing and Heating (CIPH), two major plumbing associations that represent plumbing fixture manufactures, wholesalers, and distributors, are in support of eliminating the production of non-efficient (13 L) toilet models. In the spring of 2008, the CIPH took major strides to remove 13 L toilets from the CSA Standard for Plumbing Fixtures (CSA B45). Results of the balloting process were positive, and an interim change to the CSA Standard for Plumbing Fixtures (CSA B45) is expected in the spring of 2009. While the changes do not ban the sale of 13 L toilets, they will prevent new 13 L toilets from being CSA approved and thus not appropriate for sale within Canada.

b) Peel Living Water Efficiency Retrofit Project

i) 2008 Successes

In partnership with the Human Services department, Phase 3b of the Peel Living Retrofit Project began in April 2008. Phase 3b of the retrofit project included the retrofit of 1084 residential townhomes with new water efficient fixtures including low flow toilets, low flow showerheads, and vanity and kitchen faucet aerators. Phase 3b of the project was completed by September 2008 with a total of 1475 toilet retrofitted.

Analysis of water demand data from Phase 3b of the Peel Living Retrofit Project is ongoing. Water billing data is currently being used to determine average savings per unit per day (Lud). Preliminary results revealed savings of approximately 188 litres per unit per day. In total, Phase 3b of the project has resulted in an average annual day savings of 0.204 million litres. Water billing data will continue to be monitored for the buildings retrofitted in Phase 3b to ensure savings are sustained.

c) Lawn and Garden Consultations

i) 2008 Successes

The Lawn and Garden Consultation Program addresses increasing residential outdoor water demand. During the summer months, per capita water demands increase by about 20 per cent, primarily due to outdoor water use, such as lawn and garden watering.

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER
EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

To raise awareness about effective outdoor water use, and to curb increasing summer water demands, the Region offers free Lawn and Garden Consultations to residents. The consultations focus on awareness and education with an emphasis on behavioral change. In 2008, three teams of two trained co-op students visited homeowners to assess their lawns and gardens and review their outdoor water use and landscape maintenance practices. During the consultations, students provided property specific advice and techniques to maintain a healthy lawn and garden with emphasis on chemical free, water efficient lawn and garden practices. Residents received information packages with literature on water efficiency practices and pesticide awareness, and an outdoor water efficiency kit to compliment the consultations.

The 2008 summer campaign was extremely successful, with a total of 882 consultations completed by the team. Based on the WEP's projected water savings and pilot projects completed in the Regions of Durham and Halton it was estimated that a typical household would save no less than 100 litres of water on peak demand days. By applying reported results, an estimated 88,200 litres of water has been saved on peak demand days, and 9,188 litres per average annual day as a result of the 2008 program.

To compliment the Lawn and Garden Consultation Program, the Region of Peel hosted six successful Lawn and Garden Workshops during the 2008 summer season. The workshops supported the Lawn and Garden Consultation Program and incorporated interactive demonstrations, guest speakers, and tours of the Region's Water Wise Gardens.

ii) 2009 Initiatives and Future Direction

The Lawn and Garden Consultation Program was so well received by residents in 2008, that a waiting list was created for consultations in 2009. To date, over 900 residents have been put on the waiting list for consultations in 2009. Call backs and bookings for residents on the waiting list are currently taking place. Due to large interest in the program, additional consultation spots have been made available for the 2009 summer season. A total of 1200 consultations have been made available for the 2009 season.

Although the success of the Lawn and Garden Consultations and Workshops have secured outdoor water savings, the focus of these events is being researched in an effort to secure greater residential outdoor water savings by incorporating recent cutting edge market research which considers residents' attitudes towards landscaping and outdoor water use. Lawn and garden consultants will be retrained to provide a more design oriented review of the lawn and garden rather than focus directly on water conservation. This fusion of traditional design ideas and eco-gardening innovations will help residents beautify their properties according to their unique and personal visions of their landscape while achieving many environmental benefits including but not limited to saving water and energy, reducing storm water runoff, and increasing biodiversity.

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

3. Implemented Water Efficiency Measures for 2008 – Industrial, Commercial and Institutional Programs

a) Toilet Replacement Program for Businesses

i) 2008 Successes

The Toilet Replacement Program for Businesses offers rebates of \$60 to \$140 to Industrial, Commercial and Institutional (ICI) property owners who replace non-efficient toilets with efficient *Peel Approved* models. The higher \$140 rebate is provided for the replacement of flush valve toilets, and was selected to help offset the higher cost of replacement and account for their high usage in commercial applications.

In 2008, the Region issued a total of 399 rebates to business owners. It is estimated that 86,910 litres of water per day has been saved as a result of the toilet replacement program for businesses.

ii) 2009 Initiatives

As is planned for the Residential Toilet Replacement Program, the Peel-Approved list of toilets will be changed to only include models that have passed the Uniform North American Requirements (UNAR). These changes will come into effect on April 1, 2009 and are intended as an interim measure to adopting the Water Sense standards by 2010.

b) Spray Valve Replacement Program

i) 2008 Successes

Many food service facilities use a pre-rinse spray valve to rinse food from dishes before putting them into automated dishwashers. Installing a low flow pre-rinse spray valve can reduce a facility's water and energy consumption, and lower operating costs. In 2008 a total of 421 valves were installed in Peel area restaurants resulting in water savings of approximately 126,300 litres of water per day.

Approximately half of the facilities visited did not have a spray valve apparatus for dishwashing and simply used faucets to rinse the dishes. To help these facilities save water, commercial kitchen faucet aerators are being supplied to these facilities. The faucet aerators are only being installed on sinks used for rinsing, not filling. In 2008 a total of 102 kitchen faucet aerators were provided to restaurant owners, resulting in a total savings of 44,104 litres of water per day.

c) Industrial, Commercial and Institutional Indoor Water Audit

i) 2008 Successes

Industrial, Commercial, and Institutional water demands account for almost 30 per cent of the total water demand within the Region, translating to 130 to 150 million litres of water per day. The ICI Indoor Water Audit program is aimed at identifying areas of potential water savings within ICI facilities that may be achieved through permanent process change. This program is an intensive multi-phased initiative that requires full participation from the business. To date, 60 businesses have participated in the water audit process.

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

In 2008 a total of 25 indoor water audits were conducted at facilities across Peel. Three facilities completed the audit program in 2008 and made a permanent process change and were eligible for a rebate. Changes made to the facilities resulted in a permanent water savings of 200,000 litres of water per day.

**d) Industrial, Commercial and Institutional Landscape Irrigation Audit – Pilot Project
ii) 2009 Initiatives**

A pilot project to identify potential outdoor water savings contributing to peak day demand that can be achieved through irrigation system modification for the Industrial, Commercial and Institutional sector will be undertaken in the spring and summer of 2009. The study will examine ICI summer water users and explore how summer water demands can be reduced through optimizing current timer based irrigation systems, upgrading to smart controllers, or combining smart controllers with optimized systems.

Eleven facilities have been selected for the first stage of the pilot project. This stage includes determining the watering requirements of the eleven facilities and examining whether their irrigation systems are appropriate for use in the study. Pre-monitoring of eligible facilities will be undertaken in early spring, followed by system optimization. Water savings achieved through system optimization will be determined using post monitoring data. Following post monitoring, a select number of facilities will be chosen to install smart controller systems and examine water savings above and beyond that achieved from system optimization alone.

The pilot study is scheduled to be completed by the end of summer 2009. With the results of the pilot study, Water Smart Peel will develop a suitable ICI Outdoor Water Audit program for 2010.

4. Water and Wastewater Treatment, Energy and Greenhouse Gas Savings

Table 1: Summary of 2008 Implemented Water Efficiency Measures and Related Savings

2008 Water Efficiency Measures	Expected Water Savings/Day (L)	Expected Energy Savings/Day (kW/h) From Water & Wastewater Treatment	Expected Greenhouse Gas Savings/Day (tonnes CO₂) from Water & Wastewater Treatment
Residential Toilet Replacement Program	2,193,000	2533	0.810
Peel Living Water Efficiency Retrofit Project	204,000	235	0.075
Outdoor Lawn and Garden Consultation Program	9,188	6	0.002
Pre-rinse Spray Valve Replacement Program	170,104	197	0.063
Toilet Replacement Program for Businesses	86,910	100	0.032
Indoor Water Audit Program	200,000	231	0.073
Total	2.86 ML	3302 Kw/h	1.055 tonnes CO₂

**WATER EFFICIENCY PLAN: ANNUAL UPDATE ON 2008 IMPLEMENTED WATER
EFFICIENCY MEASURES
CAPITAL PROJECT 08-1585**

The estimated average annual day water savings in 2008 was 2.86 million litres, equivalent to filling 1.1 Olympic sized pools every day. Over one year this would be equivalent to the volume of 418 Olympic sized swimming pools. This level of savings results in an estimated \$364,938 per annum savings in water treatment operating costs and \$247,053 in wastewater treatment costs.

The treatment and distribution of drinking water and treatment of wastewater is a highly energy intensive process. Much of the electricity used is produced by burning fossil fuels, resulting in the release of greenhouse gas (GHG) emissions such as carbon dioxide (CO₂) that are generally believed to be contributing to climate change. Therefore, reducing water consumption also results in reduced energy requirements and GHG emissions. In 2008 an estimated 3302 kilowatts per hour (kWh) of electricity was saved per day, enough to power 95 homes, per year. Furthermore, due to the energy savings, the emission of approximately 1.055 tonnes of CO₂ emissions were abated per day, equivalent to 77 passenger cars taken off the road.

FINANCIAL IMPLICATIONS

Funding in the amount of \$4,289,000 in Capital Project 08-1585 is approved for all programs affiliated with the Water Efficiency Program in 2009. These funds will be used for the implementation of water efficiency programs, such as toilet replacement program, water efficiency retrofit projects, indoor and outdoor water audits, and pre-rinse spray valves. The total program cost of implementing the Water Efficiency Plan from 2005 to 2015 is estimated to be \$28.5 million. The cost of the plan is expected to be less than one-third the cost of expanding Peel's water and wastewater infrastructure to supply the equivalent amount of water.

CONCLUSION

The Region's Water Efficiency Plan was developed and implemented to reduce the necessary cost of water and wastewater infrastructure expansion, while providing sufficient capacity to accommodate future growth projections to the year 2015. To date, the implemented water efficiency measures have contributed to significant water savings and as other scheduled measures are implemented further water savings will be realized by the Region.

per 
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Approved for Submission:



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