

For Information

DATE: September 13, 2011

REPORT TITLE: **WATER EFFICIENCY PLAN : REVIEW AND PROPOSED UPDATE (2012-2021)**

FROM: Dan Labrecque, Commissioner of Public Works

OBJECTIVE

The objective of this report is to inform Regional Council of the review and updating of Peel's long term Water Efficiency Plan (WEP). The report outlines the review process and framework design for the next iteration of the WEP.

REPORT HIGHLIGHTS

- Since the inception of the WEP water conservation measures have achieved water savings of approximately 18.6 Million Litres Per Day (MLd).
- The current Water Efficiency Plan is undergoing a review to better align resources with legislative, technological and marketplace changes.
- The updated Water Efficiency Strategy will include some of the existing programs such as the Residential Toilet Replacement Program (reduced rebates and phased out), Residential Humidifier Rebates, Fusion Landscaping® Consultations and Industrial Commercial and Institutional Indoor and Outdoor Water Audits.
- The updated Water Efficiency Strategy will consider new programs such as Residential Outdoor Irrigation Audits for homeowners with in-ground irrigation systems and System Operational Initiatives.
- Further research and development of potential water saving programs such as the Industrial, Commercial and Institutional Outdoor Water Audit Tool, Industrial, Commercial and Institutional Rainwater Harvesting, Green Plumbers, New Home Construction and New and Emerging Technologies will also be evaluated.

DISCUSSION**1. Overview**

At its October 13, 2011 meeting, Regional Council has before them two reports, this report provides an update on the progress of the work being undertaken to update the Region's Water Efficiency Plan (water smart peel) and a second report that provides in detail the results of the recent review of the utility rate. Both reports should be considered together along with the various proactive operational initiatives being undertaken to balance the overall operation of the water and wastewater systems. A short discussion of the three disciplines is provided in this overview to assist in putting the report in context.

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The Region of Peel as an organization fulfills many roles with regard to the water and wastewater systems. It operates the systems and ensures quality, it recovers the cost of operations through the utility rates and it promotes and protects the overall environment in the Region. Therefore, the policies and the associated management of the Region's water and wastewater systems require Council and the organization to consider three different disciplines.

The first and most important is the quality and the predictability of the operational systems. Ensuring that water is potable through effective treatment and delivered efficiently and that infrastructure is available to facilitate growth and economic activity is essential. In the case of wastewater ensuring that effluent is properly captured, transported and treated is also essential. Combined these operational priorities must be met to ensure a healthy and vibrant community.

Water is a natural resource and the availability of fresh drinking water world wide is declining. Being located on the great lakes the Region has an abundance of fresh water available. However, protecting the quality of the lakes and water courses and ensuring efficient use of water is a necessary component of operating the water and wastewater systems and therefore the environment also becomes part of the overall equation.

In addition to balancing the environment and operational needs, recognizing the financial discipline and implications of managing a system is important. Ensuring the costs of the systems are recovered through a fair and equitable method that promotes use of the system both commercially and domestically along with encouraging water use behavior that respects the environment is another challenge. The financial structure must recover the costs based on use and also deal with the variability of water use due to weather, changing economic conditions and changing attitudes.

2. Background

The Water Efficiency Plan (WEP) was implemented in 2005 in response to increasing demands on the Region of Peel's water and wastewater treatment systems. Implementing the Water Efficiency Plan reduces excessive water use, adds capacity to the current water and wastewater infrastructure and aligns with regional environmental objectives through conserving energy and reducing greenhouse gas emissions.

Before the adoption of the WEP, Peel's average gross water demand was greater than 400 litres per capita per day (Lcd). The current gross water demand in Peel is approximately 345 Lcd (a reduction of over 12 per cent in just five or six years). As of mid-2011, Peel's WEP has saved approximately 18.6 MLd, or almost 16 Litres Per Capita Per Day (Lcd).

As a result of the WEP the following programs have been implemented: Residential Toilet Replacement, Residential Humidifier Rebates, Fusion Landscaping® Consultations, Industrial, Commercial and Institutional (ICI) Outdoor Water Audits, and ICI Indoor Water Audits. A detailed summary of progress on these programs was reported in the Water Efficiency Plan Annual Update on 2010 Implemented Water Efficiency Measures report to Regional Council May 26, 2011.

The exercise of updating of the WEP is inline with the Regional Strategic Plan and Term of Council Priorities. The updated Water Efficiency Strategy specifically supports Goal 1 of the 2011 to 2014 Strategic Plan: Protect, enhance and restore the environment. The Strategy supports this goal through demonstrating leadership in responsible environmental

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management and by protecting and restoring water resources. The Strategy also supports the Term of Council Priorities 3 and 1 of reducing per capita water consumption and reducing greenhouse gas emissions.

3. Review Process

As with all long-term plans, it is best practice to review and update the WEP every five to ten years. The updated Water Efficiency Strategy will represent that update. The Strategy considers and addresses legislative, technological and marketplace changes that have occurred over the last few years.

Careful screening of water efficiency programs includes technical feasibility, applicability and social acceptance. With consideration for new and future programs the timelines and budget are to be re-aligned accordingly.

The draft Strategy will be shared with internal and external stakeholders for review and comments. Beyond this report Regional Council will be engaged through consultation with the Public Works Committee Chairs and senior management. The stakeholder consultation will occur in the Fall of 2011 and a final draft report, including feedback from stakeholders, will be brought forward to Regional Council for endorsement in Spring 2012.

4. Water Efficiency Strategy Outline for 2011-2021

The criteria for updating the plan were derived from analysis and interpretation of water consumption data in conjunction with the existing WEP. Review and validation of previous measures was critical in recognizing water consumption trends within the Region. This understanding will realize the reallocation of resources that will contribute to programs with the most potential for water savings.

a. Strategic Goals and Targets

One of the key changes that will likely be recommended in the new plan is to shift the focus of water efficiency in the Region of Peel away from measuring the total amount of water saved as this amount is somewhat meaningless given that growth is naturally occurring in the Region of Peel and therefore water usage will increase.

A greater emphasis on measuring per capita usage is being considered. Per capita measures provide a better indication of the efficiency of the water used, essentially answering the question of whether water is being used wisely – are we water smart. The new Strategy sets specific water savings targets which reflect current conditions within the Region and North America. The three recommended specific types of water savings targets are:

1. per capita indoor water demand targets for the single-family sector
2. volumetric indoor water savings in the ICI customer sector
3. volumetric irrigation savings for all customer sectors

These goals will be established to ensure compliance with the various pieces of provincial legislation as well as ensuring sustainability of the operational system as discussed in the previous section.

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Water Efficiency programs included in the new Strategy were screened and vetted for technical feasibility, applicability and social acceptance. The following programs are considered for implementation.

i. Toilet Replacement Program

One of the major changes to the WEP that Council will see is a different approach to the use of toilet rebates. Water used for toilet flushing typically accounts for about 30% of indoor water demands. To incent residents and businesses to replace non-efficient toilets with water efficient models, the Region of Peel currently offers rebates to residents and businesses that purchase and install Water Sense certified toilets (High Efficiency Toilets or HET).

To reflect recent and upcoming market changes, consideration is being given to modifying the Region's Toilet Replacement Program to only offer two tiers of rebates at lower than the current amounts and impose a limit of two rebates per household. This change reflects the success of the current program and the reality that the rebates are no longer as vital to incenting consumer behaviour towards water efficient fixtures. As the market continues to change, and as water efficient toilets become more readily available to consumers, the program will continue to be evaluated and potentially phased out in three to five years.

ii. Residential Humidifier Rebates

To maintain indoor comfort during dry winter months, many homeowners choose to install furnace mounted humidifiers. Most water-efficient humidifiers are designed to waste significantly less than 50 litres of water per day and some waste less than 10 litres per day. As such, the Region's program will continue to offer rebates consistent with the current structure and values.

iii. Fusion Landscaping ®

Traditional landscaping design requires significant irrigation, fertilization and maintenance. Ideal landscapes are viewed as being neat and well organized, having lush weed-free lawns, and having colour provided by mainly annual flowers.

Fusion Landscaping ® offers homeowners alternative landscape designs that meet their aesthetic beliefs while achieving Peel's water saving targets. The new approach to landscaping significantly minimizes the need for supplemental irrigation and, as a result, reduces energy use and related GHG emissions.

The Region will continue to offer the very popular Residential Fusion Landscaping ® Consultations.

iv. Residential Outdoor Irrigation Audits (for in-ground systems)

Single-family homes with automatic irrigation systems often over-irrigate, applying as much as 50 mm of water to their lawns each week, compared to the typical single-family home that applies only 8 to 10 mm. Reasons for over-

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irrigation include ease of application, improper setup of the irrigation controller, improperly designed systems, and mechanical faults including broken heads and system leaks. By correctly adjusting irrigation schedules and repairing system leaks, it is anticipated that irrigation depths can be reduced.

The Region will conduct a pilot program to research the opportunities for water savings through this residential outdoor irrigation program.

v. ICI Outdoor Water Audits

Many ICI facilities with large landscapes are equipped with automatic irrigation systems. Outdoor Water Audits of ICI facilities completed by the Region in 2009 and 2010 identified a significant opportunity for water savings at these sites, with an average of almost 25,000 litres saved per day per site over the summer months. The water savings are a result of system optimization, repair, and software improvements.

It is anticipated that Peel will increase uptake in this program by approximately 20 per cent participation per year.

vi. ICI Indoor Water Audits

To incent ICI facilities to save water through permanent process changes, the Region operates an Indoor Water Audit program that acts through capacity buy-back principle. ICI customers that participate in the program receive an indoor water audit and are eligible to receive a rebate based on their level of sustained water savings.

Peel will continue this program and increase participation by facilities by approximately 20 per cent participation per year.

vii. Operational Initiatives

Water loss management is ongoing because factors that affect water loss are dynamic and cannot entirely be eliminated. There are four basic approaches to controlling water loss:

1. maintaining and improving the integrity of the water system infrastructure
2. managing water pressure
3. proactive water leak detection
4. responsive water leak repair

Peel is proactive in maintaining and improving the integrity and condition of the water system infrastructure through regular preventative maintenance programs, comprehensive condition assessments, and infrastructure renewal programs. Water pressure is a key factor that is always considered when preparing for water system expansion and improvement projects.

Water leak detection is integrated with annual water system valve and fire hydrant inspections. Any leaks identified through the inspection program, by the public or due to watermain breaks, are repaired in a timely manner.

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The Region's Water Operations staff will continue best practices with regards to these operational initiatives.

c. Outreach and Education

Success in meeting the targets of the Water Efficiency Strategy depends largely on the participation by residents and other stakeholders in each of the recommended water efficiency measures. Effective marketing, outreach and environmental education programs that raise awareness of the importance of water conservation and resonate with target audiences are critical to the Strategy's success. Undertaken marketing initiatives will be program specific and take into consideration key program messages and identified stakeholders. The Water Smart Peel website and community events are two examples of effective outreach and education.

i. Community Events

Peel's Public Works Department participates in over 100 special events annually in the Peel community. These events range from Councillor forums to fall fairs. On a yearly basis, Region of Peel representatives have the opportunity to highlight water conservation programs and services to over 15,000 people at these events.

ii. Watersmartpeel.ca

The Water Smart Peel website offers more than just program details: it provides residents with the opportunity to learn more about water efficiency within their homes, such as how to check for and repair leaks. The website is a resource for customers applying for the Toilet Replacement Program and registering for Fusion Landscape® Consultations. For Industrial, Commercial, and Institutional (ICI) customers it provides information on programs and case studies on indoor and outdoor water reduction.

d. Future Program Research and Development

The following are proposed for future program research and development. Further research is required to determine the effectiveness of the proposed programs and whether they meet all three screening criteria to ultimately become a viable water savings measure within Peel's water efficiency program.

i. ICI Irrigation Audit Tool

Significant water savings can be achieved by reducing irrigation demands through system optimization, repair, and software improvements. In the summer of 2009 the Region of Peel developed a template for large ICI customers to quantify their potential irrigation savings on a zone by zone basis. The support for further development of this template into a software tool could expedite the landscape audit process and increase the efficiency of program delivery by efficiently identifying sites with significant potential water savings.

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ii. ICI Rainwater Harvesting

Historical rainfall data and minimum landscape irrigation requirements for local landscapes suggest that rainwater collected from a facility's roof can be sufficient to irrigate a facility's property. In some cases, this irrigation water can also be supplemented by relatively clean, non-contact cooling water that would otherwise be sent to the sewer.

The intention of this research is to verify the potential of using rainwater to irrigate ICI landscapes. Further research is required to quantify the volume of water that can be collected through a rooftop rainwater harvesting system, determine the costs associated with installing, operating, and maintaining a rainwater harvesting system, and ultimately assess the cost-effectiveness of such systems.

iii. Green Plumbers

Green Plumbers USA is an innovative national training and accreditation program that assists plumbers in understanding their role concerning the environment and public health. The organization's goal is to train thousands of plumbers to promote the benefits of water conservation and to reduce greenhouse gas (GHG) emissions by changing consumer and plumbing behaviour through the use of energy efficiency and water saving technologies. As part of the Strategy, Peel, in partnership with other Ontario and Canadian municipalities, will evaluate whether it would be effective to support the growth of the Green Plumbers program in the Region of Peel and throughout other Canadian municipalities.

iv. New Home Construction

New home construction represents the most cost-efficient opportunity to achieve long-term sustainable water and energy savings as new efficient appliances, fixtures, and technologies can be more cost-effectively included in new home construction than in renovations and retrofits. Currently, the majority of new home construction is built to minimum water efficiency requirements as outlined by the Ontario Building Code. The Region plans to work with community developers and new home builders to assess the possibility of providing rebates to residents who purchase new homes with water efficient upgrades.

v. New and Emerging Technologies

As new and emerging technologies come available in the marketplace Peel will consider the feasibility of introducing select viable technologies as pilot programs and where applicable work in partnership with interested municipalities in Ontario and North America. Because water efficiency is considered a relatively new field, research and development are key components to advancements in water efficiency and conservation.

vi. Partnerships

Within Peel, community environmental projects focused on water efficiency and storm water management are undertaken by numerous groups including area municipalities, conservation authorities, and community groups. Peel will

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continue to support and pursue partnerships with these groups to leverage resources, provide consistent messaging, and enhance joint initiatives. Joint environmental initiatives demonstrate Municipal and Regional environmental responsibility and help satisfy requirements of a Water Sustainability Plan under the Ontario Water Opportunities Act by increasing co-operation with other municipal service providers to maintain and improve the municipal service.

CONCLUSION

Since the development and implementation of the WEP in 2005, quantified water savings have been attributed to the many water efficiency programs. Existing and new programs have been evaluated and considered for inclusion in the 2012-2021 Strategy. The updated Strategy will better reflect the changes in marketplace and technology and help meet our goals of the Regional Strategic Plan and Term of Council Priorities.



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