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WATER FOR TOMORROW WATER EFFICIENCY MASTER PLAN UPDATE

The Transportation and Works Committee recommends the adoption of the recommendations contained in the following report, May 24, 2007, from the General Manager, Water and Wastewater:

1. RECOMMENDATIONS

It is recommended that:

1. The Regional Clerk forward this report to the Clerks of the local municipalities seeking comments on the proposed program by October 2007.
2. Following consultation with local municipal staff, Regional staff report back to Transportation and Works Committee and Regional Council with a detailed program for water use efficiency for the next 10 years.

2. PURPOSE

York Region has embraced water use efficiency for the past ten years as a large component of the long term water supply strategy. Water use efficiency also directly supports York Region's sustainability strategy. An update of the Water Efficiency Master Plan was completed in April, 2007. This document provides York Region with a strategic plan for the implementation of water efficiency for the next 10 years. This report will highlight the recommendations of the Water Efficiency Master Plan Update and provide a plan for moving forward with new water efficiency initiatives.

3. BACKGROUND

Through the *Water for Tomorrow* program, it has been demonstrated that water efficiency is an effective component of York Region's long-term water supply strategy. Overall the program has saved approximately 20.3 million litres of water per day, enough water to supply a community of approximately 77,000 people. The program has also contributed positively to York Region's objective to reduce greenhouse gases. Over 3,809 tonnes per year of carbon particulates and 14,375 tonnes per year of carbon dioxide are reduced as the result of *Water for Tomorrow*. The comprehensive water efficiency program demonstrates to the public and to government regulators that York Region is taking a responsible approach to water supply by making the best use of existing resources.

Water for Tomorrow is well known to residents and businesses of York Region. Program technicians have visited over 118,000 homes, 10,400 apartments, 180 schools and 14,200 businesses. During the visits, over 245,000 water saving toilet flappers and 106,000 low flow showerheads were installed. Approximately 1,800 km of water-main has been tested in all of the local municipalities. Sixty industrial/institutional water usage audits have been completed resulting in sustained water savings of 20.3 million litres per day. Technology can achieve major water savings but education is necessary to meet the long-term objectives. Annually, *Water for Tomorrow* has been represented at fairs, home shows, environment days and community events across York Region. Bulletins distributed through the water bills twice per year and community newspaper and television advertising have all contributed to the success of the water efficiency education program.

Youth education has been a major focus of *Water for Tomorrow*. The award winning Grade 7 curriculum module developed and implemented by the *Water for Tomorrow* project team has been delivered to over 50,000 students in York Region and continues to be extremely popular with teachers and students alike. Over 22,000 Grade 4 and 5 students have learned about water in the out-of-doors at the annual York Children's Water Festival. Held every year at Bruce's Mill Conservation Area, 5,000 children attend the five-day event where they learn by participating in over 40 curriculum-based activities about water and the environment.

Another goal of the program is to reduce summer outdoor water use by encouraging water efficient garden and landscaping. Over 5,000 residents have received free landscape audits. There are also opportunities to learn about water-wise gardening from the many garden demonstrations at participating garden centres, conservation areas and local college, and workshops and newspaper advertising.

Water for Tomorrow has been recognized for excellence by numerous organizations including the Ontario Water Works Association, Water Environmental Federation, FCM's Sustainable Communities Awards and the World Water Forum in Kyoto, Japan. Many of the components of *Water for Tomorrow* have been adopted by neighbouring municipalities and overseas in the United Kingdom and Eastern Europe.

3.1 Water Efficiency Master Plan Update

Regional Council at its meeting on February 16, 2006 adopted Clause 2 of Report 1 of the Regional Transportation and Works Committee, approving a recommendation to contract Resource Management Strategies Inc. to complete a Water Efficiency Master Plan Update, and International Water Association (IWA) Water Audit and Water Balance. The Water Efficiency Master Plan Update and Water Audit and Water Balance was completed in April, 2007. This report provides the recommendations from the Master Plan Update and outlines a Regional program that will further efforts in improving the effectiveness of the water efficiency program.

4. ANALYSIS AND OPTIONS

It is important that York Region continue to build upon the success of the *Water for Tomorrow* program. Growing communities will continue to put pressure on York Region's valuable water supply resources. Continuation and expansion of the water use efficiency program is required and will provide the following benefits to York Region:

- Water efficiency directly supports York Region's sustainability strategy.
- The cost of the selected water use efficiency measures represent the cheapest "source" of water supply for York Region at about 16% of the average Region wide cost to expand water and wastewater infrastructure.
- Water use efficiency measures help to defer the need for major capital expenditures and can assist in reducing supply allocations for local municipalities.
- Water use efficiency can significantly help manage the summer demand periods and help alleviate outdoor water restrictions and bans.
- Key review and approval agencies, such as the Ministry of Environment and the Ministry of Natural Resources, are reluctant to support new capital projects without a demonstrated commitment to water use efficiency.
- Water use efficiency is a required component of Watershed Plans required under the Oak Ridges Moraine Conservation Plan.
- Water use efficiency is a required component of the Ministry's recently revised Permit to Take Water Program.
- Water use efficiency is a required component of the Individual Environmental Assessment for the South East Collector Trunk Sewer
- Great Lakes Charter Annex Bill 198 proposes to amend the Ontario Water Resources Act to allow regulations to be made regarding conservation, water use efficiency and sustainable use.

4.1 Water Use Efficiency Recommendations

A ten year water efficiency strategy was developed through the screening of a comprehensive list of water efficiency measures based on local and North American programs and water efficiency research. The screening process considered the technical, potential, and achievable feasibility of each measure in order to create a short list of measures. Water savings and cost analysis then determined the cost effectiveness of each short-listed measure. The cost of implementing the measure per litre of water saved per day was compared to the cost of developing and constructing new water infrastructure per litre per day thereby determining the most cost effective measures. Results from residential indoor and outdoor water audits, market research and public consultation helped create a feasible 10 year program strategy.

The recommended components of the Water Use Efficiency Master Plan Update are expected to save approximately 23.4 million litres of water per average day. This 10 year program carries a capital cost of \$30,788,100. This translates to a cost of approximately \$1.31 per litre per average day saved. The capital cost to develop and construct new

water and wastewater supply infrastructure in York Region is currently in the range of \$1.41 - \$30.43 per litre per day, with a Region wide average of \$8.14 per litre per day. As an added benefit the 10 year water efficiency program will not only save water but also reduce carbon dioxide gas emissions by approximately 22,000 tonnes per year.

In order to sustain the water savings over time, a budget of \$10,929,735 for monitoring and maintenance is also included in the program cost. The ongoing monitoring will validate the water savings achieved and ensure that those savings are sustained over time through the maintenance program.

The recommended water efficiency program is broken down into four major categories; residential, industrial/commercial/institutional (ICI), leakage detection and education. Details of each component are provided below.

4.1.1 Residential Program

The residential program would offer all residents of single family and multi-family high rise dwellings incentives for installing water efficient measures inside and outside the home. These incentives can be offered through the following offers:

- Rebates towards the purchase of new water efficient toilets, clothes washers, central humidifiers, rain barrels, and irrigation sensors.
- Water efficient landscape visits by trained advisors.
- Water efficient home visit by a trained advisor to inspect for indoor leaks and install kitchen faucet aerators.

It is expected that the residential program could provide water savings of approximately 8 millions litres per day over the course of the 10 year program. Maintenance of the residential program would include education of water users, tracking of participants, a customer call centre to respond to inquiries and the provision of replacement products or parts.

Monitoring and evaluation of the residential program is recommended to ensure the water savings are achieved initially and the savings are sustained over time. Detailed residential audits would be carried out in years 3, 6 and 10 of the program.

4.1.2 Industrial, Commercial and Institutional (ICI) Program

The Industrial, Commercial and Institutional (ICI) program would be aimed at ICI facility/building managers, laundromat owners, commercial kitchens and large volume industrial clients. This program can be offered through the following incentives:

- Rebates towards the purchase of new water efficient toilets and clothes washers.
- Water efficient commercial visit for commercial kitchens and cafeterias, including installation of a low flow pre-rinse spray valve, free of charge.
- Water audits would be offered free of charge to large volume industrial clients which would include a capacity buy-back incentive of \$0.30 per litre of water per day to replace inefficient processes with water efficient processes.

The ICI program could provide savings of approximately 8.6 million litres of water per day over the course of the ten year program. Maintenance of the ICI program would include education of water users, tracking of participants, a customer call centre to respond to inquiries and the provision of replacement products or parts.

Monitoring and Evaluation of the ICI program is recommended to ensure the water savings are achieved initially and the savings are sustained over time. Detailed ICI audits would be carried out in years 3, 6 and 10 of the program.

4.1.3 Distribution Leakage Detection Program

As part of the Water Efficiency Master Plan Update an International Water Association (IWA) Water Audit and Water Balance was completed. This audit identified potential leakage throughout the municipal and regional distribution system and recommended a pro-active leakage reduction program.

Based on the temporary district meter approach used in the initial *Water for Tomorrow* program, 60 temporary district meter areas (DMAs) would be established temporarily to identify and repair leaks over a three year period. The water distribution system is owned and operated by the local municipalities therefore York Region will develop this program in close association and with full cooperation of the municipalities.

The 6.9 million litres of water saved per day attributed to the Distribution Leakage Detection Program represent 29% of the recommended programs overall savings. In order to maintain this savings it is recommended that each DMA is revisited every three years to identify and repair new leaks.

4.1.4 Education Program

Changing habits and attitudes towards water use is essential in achieving long term water savings. The *Water for Tomorrow* program has recognized the importance of education as a tool in long term water demand reduction.

Water for Tomorrow and the Water Efficiency Master Plan Update recognize the need to change attitudes and actions of young people, to impress the importance of long term sustainability. The recommended program would continue with an update of the successful youth education program including; the York Children's Water Festival, grade 7 curricular program, poster drawing/calendar contest, and the interactive website.

The recommended public education program would continue the successful broad scale education that is currently part of the *Water for Tomorrow* program including; literature such as booklets, leaflets and flyers, bi-annual water efficiency bulletins distributed with water bills, display booths at home shows, fairs and other community events, displays at Regional administration building and area municipality civic centres, presentations at service clubs, community and youth groups, water efficient display gardens, water efficient gardening seminars and workshops, material supporting the Water Efficient

Landscape Home Visits such as DVDs, fact sheets, plant lists and the *Water for Tomorrow* website. The first year of the program would include developing new graphics and designs for the education materials.

4.2 Discussion with Local Municipalities

The Water Efficiency Master Plan Update was presented to local municipal waterworks staff at the May 2, 2007 Waterworks Liaison Committee. There was general agreement the program should be carried out. Further discussion will take place with the local municipalities, especially with respect to the distribution leakage detection program.

5. FINANCIAL IMPLICATIONS

The present value unit cost to expand water and wastewater supply infrastructure in York Region ranges from \$1.41 to \$30.43 per litre per day. Water savings accomplished through the recommended water efficiency program strategy costs \$1.31 per litre per day. Considering an estimated water savings of 23.4 million litres per average day, the recommended *Water for Tomorrow* program strategy will save York Region in the range of \$187 Million over the next best alternative of securing new water supplies over the next 10 years based on the York Region average cost of \$8.14 per litre per day to expand the water and wastewater infrastructure. An updated water efficiency program will ensure that York Region continues to provide the most cost effective water supply options to its residents by maximizing conservation opportunities.

The estimated cost to conduct the recommended 10 year program is \$41.7 Million. It is recommended that these funds be added in the proposed 2008 budget and capital plan, funded 80% from development charges and 20 % from user rates. A cost summary of the water efficiency program components are shown below in Table 1 followed by a summary of the maintenance and monitoring and evaluation components in Table 2.

The capital and maintenance costs for the recommended 10 year program will be included in the next Development Charge By-law Update scheduled for 2008.

Table 1
10 Year Capital Program Component Summary

Program	10 Year Capital Cost	Water Saved Litres/day	Cost per Litre Saved
Residential	\$16,330,560	8,014,000	\$2.04
ICI	7,253,550	8,570,400	0.85
Leakage Detection	2,664,000	6,900,000	0.39
Education	4,440,000	N/A	N/A
Scope of Work	100,000		
Total	\$30,788,110	23,484,400	\$1.31

Table 2
Maintenance and Monitoring and Evaluation Program Components Summary

Program	Maintenance	Monitoring and Evaluation
Residential	\$ 2,484,155	\$ 1,138,820
ICI	412,860	366,900
Leakage Detection	6,527,000	N/A
Education	N/A	N/A
Total	\$ 9,424,015	\$ 1,505,720

6. LOCAL MUNICIPAL IMPACT

Continued implementation of the *Water for Tomorrow* program will provide a secure and cost-effective supply of water to the residents of York Region. The completed water audit and water balance has provided the local municipalities with a tool that can be used to benchmark performance against world class utilities in Canada and around the world. Local municipalities will be encouraged to participate in the program, cooperation between the local municipalities and York Region will be particularly important during the development and implementation of the distribution leakage detection program. A general consensus for support of the Water Efficiency Master Plan Update was received from the local municipalities at the Waterworks Liaison Committee meeting, May 1, 2007.

7. CONCLUSION

Water for Tomorrow, York Region's water efficiency program, is currently saving 20.3 million litres of water per day. Ongoing education programs will assist in sustaining the water savings until December 2008. The program recommended by the Water Efficiency

Master Plan Update will continue to assist in sustaining the existing savings and is estimated to save an additional 23.4 Million litres of water per day over 10 years. This program would provide York Region with the most cost effective water supply as well as help meet the requirements of the Ministry of the Environment Permit to Take Water Program and the Watershed Plans as required by the Oak Ridges Moraine Conservation Plan.

In order to implement the recommendation of the plan, consultation with the local municipalities is required to determine roles and responsibilities and the contractual approach for implementation. Staff will report back in fall of 2007 with final recommendations for incorporation into the Regional budget.

For more information on this report, contact Ilmar Simanovskis, extension 5027, Manager Technical Support of the Water and Wastewater Branch in the Transportation and Works Department.

The Senior Management Group has reviewed this report.