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WATER USE EFFICIENCY INDUSTRIAL/INSTITUTIONAL AUDIT PROGRAM

The Transportation and Works Committee recommends the adoption of the recommendations contained in the following report, December 17, 2003, from the Commissioner of Transportation and Works:

1. RECOMMENDATIONS

It is recommended that:

1. Staff be authorized to extend the deadline for the Industrial/Institutional Water Usage Audit Program to December 31st 2004.
2. Staff be authorized to offer an financial incentive as outlined in this report to encourage large volume water users to implement cost-effective water saving measures.

2. PURPOSE

With the end of the Industrial/Institutional Water Usage Audit Program approaching in the near future, the purpose of this report is to obtain authorization to offer incentives to encourage large volume water users to implement cost-effective water savings measures and to recommend an extension of the Program which is scheduled to terminate June 30th 2004.

This enhancement would be accommodated within the originally approved budget for Water for Tomorrow.

3. BACKGROUND

Faced with an enormous amount of growth, limited existing service agreements and potentially huge capital costs for major new infrastructure outside its boundaries, York Region embarked on a Water Supply Master Plan in 1996. The study objective was to develop a comprehensive long-term strategy to serve the Region's water supply needs to 2031.

As part of the York Region's Long Term Water Strategy, Water for Tomorrow, the Region's *Water-Use Efficiency Program* commenced on July 1st 1998. The program is designed to save 19 million litres of water per day, enough water to supply 71,000 people.

The program's Scope of Work, approved by Regional Council in April 1998, includes five distinctive activities,

- Residential/Commercial Retrofit Program,
- Industrial/Institutional Audit Program,
- Leakage Reduction Program,
- Public Education,
- Maintenance.

As one of the four components identified in the Region's Water Supply Master Plan, water-use efficiency represents the lowest cost source of water. Aside from financial considerations, the Region's comprehensive program demonstrates to the public and to government regulators that it is taking a responsible approach to water supply by making the best use of existing resources.

Water for Tomorrow finished its fifth year on June 30th 2003. Over 118,000 home visits have been completed with over 63,000 of those visits resulting in a retrofit of a toilet or showerhead. 10,400 high rise residential apartments, 14,200 commercial businesses and 180 schools have participated. In total, over 231,000 early-closing toilet flappers and 99,000 water-saving showerheads have been installed since the start of the program. Over 1,700 km of water-main has been tested in the municipalities of Aurora, Georgina, King, Richmond Hill, Vaughan, Newmarket, East Gwillimbury, Markham and Whitchurch-Stouffville. Fifty-five industrial/institutional water usage audits have been completed.

Water for Tomorrow has demonstrated that water efficiency is an effective component of York Region's long term water supply strategy. Overall the program is saving approximately 18.0 million litres of water per day, well on its way to meeting and exceeding its objectives.

To date, fifty-five industrial/institutional water audits have been completed by the consulting company contracted to implement this program. More than 1.7 million litres per day of potential water savings have been identified with paybacks usually less than two years. Three companies have implemented recommendations from the audit resulting in actual water savings of 426,000 litres per day.

Large volume water users within the industrial and institutional sectors are identified and offered the services of an engineering professional to complete a comprehensive audit of the facility. The audit report provides a list of recommendations which the customer can undertake in order to realize water savings. Typical facilities include commercial laundries, hospitals, steel fabricators, auto parts manufacturers, and other facilities where large quantities of water are used as part of every day operation.

The detail audits evaluate individual water uses including; domestic, irrigation, cooling and process. Typically an audit takes between one to two days to complete. There is no charge to the customer for the audit service.

There are two purposes of the audit. The first purpose is to identify inefficient water uses and recommend measures that do not require complex engineering solutions to rectify. These measures may include replacing or retrofitting existing domestic plumbing fixtures, installing manual or automatic control valves, altering operation parameters of existing control valves, or recommending changes to operations methodology or personnel habits.

The second purpose of the audit is to identify water efficiency measures that do require engineering solutions. The auditor is not expected to evaluate and design the remedial solutions - this will be left to a qualified engineer or manufacturer familiar with the problem - but rather is expected to recognize the potential for water savings and have some sense of the viability of the recommendation and is paid for by the individual user.

Cost for the customer to implement the list of recommendations could range from several hundred dollars to several hundred thousand dollars. Implementation must be encouraged and the upfront capital expenditure is usually the barrier.

In addition to the audit activity, training seminars are provided. These training sessions involve general water efficiency procedures as well as site specific examples. The sessions are not intended to convert facility personnel into water efficiency experts but rather to reinforce concepts covered in the audit and to empower them to maintain and expand the water savings resulting from program implementation. There is no charge to participants for the training.

A list of high volume water customers within the industrial and institutional sectors has been developed by each of the Local Municipalities. In declining order of annual water consumption, each customer is contacted inviting the facility to participate in the program. A presentation is made to the key decision maker illustrating the audit process, examples of reports, different approaches to implementing the recommendations and, finally, the overall benefits of having an audit completed.

Monitoring and evaluation (M&E) activities are undertaken in order to verify the actual water savings achieved by implementation but also to ensure that the savings are sustained. The M&E activities include pre and post-implementation water meter datalogging, customer surveys and follow-up audits.

In order to ensure that recommendations from the audit process which have been implemented and are saving the estimated water volume to the satisfaction of York Region and the customer, the Engineering Consultant undertakes the following activities:

- Periodic visits by the Engineering Consultant's representative to the customer's facility providing assistance to the customer in the development and implementation of an ongoing maintenance plan designed to sustain the achieved water savings.
- Savings validation is completed by the Engineering Consultant by utilizing meter data (either gathered electronically or manually) for a period of one month pre-measure and one month post-measure.

- Follow-up audit of the Client's facility in Year 8 to ensure water-saving measures previously implemented are still in place and achieving the expected savings.

To encourage companies to implement the recommendations, a recognition program has been developed. A company taking that first step of having a water audit completed receives a certificate of recognition from the Chairman of York Region. A company following through with the recommendations receives the "Chairman's Award", a handsomely framed "Group of Seven" print with an appropriate plaque of recognition mounted on the frame. The company is also recognized in the York Region Business News. This approach not only congratulates the participating company but creates "peer" pressure on other companies in the area to become involved.

4. ANALYSIS AND OPTIONS

4.1 Program Need

It is important to build on the success of the Program. Excessive demands continue to put pressure on the water supply system. Enhancement of the Industrial/Institutional Water Usage Audit Program is required for the following reasons:

1. The cost of water use efficiency measures represents the cheapest "source" of water supply for the Region at about 25% of the cost of new surface water supplies.
2. Water use efficiency measures help to defer the need for major capital expenditures and can assist in reducing supply allocations for local municipalities.
3. 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 by the proponent.
4. Water use efficiency is a required component of Watershed Plans required under the Oak Ridges Moraine Conservation Plan.

4.2 Program Enhancement

Although there is only six months left in the capital portion of the Industrial/ Institutional Water Usage Audit Program, there is still ample opportunity to achieve even greater savings in this market sector. Out of the 55 audits completed, three companies implemented water efficiency measures that resulted in major savings as indicated above. There are another 14 facilities that have not taken any action but represent a potential saving of 993,000 litres/day. The major barrier for these companies... capital cost of the water efficiency measures. It is suggested that the Program provide an incentive to these companies to participate.

This approach in the industrial market is commonly called "a capacity buy-back". The Region would increase its capacity to supply others by providing incentives for the installation of water efficiency technology.

The incentive offered to each site will vary depending upon the amount of water *actually* saved rather than upon *potential* water savings. To qualify, the water savings must be

sustained and be the result of a change in process or equipment rather than a change in water using habits. The water savings will be verified at each site prior to the incentive being provided.

By agreement with United Utilities Canada Limited, the Industrial/Institutional Water Usage Audit Program is scheduled to end in six months on June 30, 2004. To capitalize on the “capacity buy-back” approach additional time is required for promoting the program and to give companies time to implement the measures. An additional period of six months through to December 31, 2004 would provide ample time to implement the program enhancement effectively.

4.3 Financial Analysis

The present value unit cost to expand water supply infrastructure in York Region, Peel Region, Durham Region and the City of Toronto ranges from \$0.47 per litre per day to \$2.50 per litre per day.. The present value unit cost to expand wastewater infrastructure in the same municipalities range from \$0.65 to \$2.97 per litre per day.

Since outdoor irrigation does not qualify for this program, it is expected that all water saving measures will affect both water supply and wastewater flows. Since the combined unit cost of water and wastewater infrastructure ranges from \$1.12 per litre per day, any incentive less than that combined cost would be cost effective.

An incentive of \$0.40 per litre per day savings up to a maximum of 50% of the cost of the water efficiency measure is recommended.

An incentive of \$.40 per litre per day provides a benefit/cost ratio ranging from 2.8 to 11.0. The benefits are over three times the cost. This incentive is thought to be the amount necessary to persuade the client to implement the measures.

Example

Company ABC can save 136,986 litre per day of water by installing a cooling tower. The cooling tower has a capital cost of \$80,000. Upon verification of the savings, the Region calculates a potential a rebate of \$54,794.40 (136,986 litres x \$0.40). Since this exceeds 50% of the capital cost, a rebate of \$40,000 would be provided.

It would cost \$275,000 in rebates if all of the targeted 14 companies implemented measures achieving 993,000 litres per day of savings.

The three companies who have implemented water saving measures earlier in the program made the decision based on the financial benefits to their companies at that time. The benefits were such that the initial capital investments were paid for in less than two years. Retro-active rebates would not be available to these companies. The other companies who had audits performed, beyond the targeted 14 companies, had recommendations based on additional maintenance or changes in procedures or habits requiring little or no capital investment.

5. FINANCIAL IMPLICATIONS

It is estimated that it would cost \$275,000 for rebates and \$25,000 in program management fees totalling \$300,000 to implement the recommended enhancement to the Industrial/Institutional Water Usage Audit Program in 2004. \$320,000 is available in the 2004 budget due to cost efficiencies found in the Residential/Commercial Retrofit component of the Water for Tomorrow program. As such there would be no negative financial impact.

6. LOCAL MUNICIPAL IMPACT

Continued implementation of the Industrial/Institutional Water Usage Audit Program as outlined in this report increase the available supply to the local municipalities assisting in meeting future demands caused by growth.

7. CONCLUSION

The recommended enhancement and extension of the Industrial/Institutional Water Usage Audit Program will provide up to 993,000 litres per day of cost-effective water savings providing additional capacities to meet municipal needs.

The Senior Management Group has reviewed this report.