



**STAFF REPORT
ACTION REQUIRED**

**Implementing Water Efficiency Measures within Parks,
Forestry and Recreation Facilities**

Date:	December 17, 2007	
To:	Public Works and Infrastructure Committee	
From:	Lou Di Gironimo, General Manager, Toronto Water Brenda Librecz, General Manager, Parks, Forestry and Recreation Joe Pennachetti, Deputy City Manager and Chief Financial Officer	
Wards:	All	
Reference Number:	P:\2007\Cluster B\TW\pw07049	(AFS # 3926)

SUMMARY

The purpose of this report is to provide an overview of the actions required from Parks, Forestry and Recreation to help successfully achieve the objectives of the City’s Water Efficiency Plan and Toronto Water’s Water Loss Reduction Strategy.

RECOMMENDATIONS

The General Managers of Toronto Water and Parks, Forestry and Recreation, and the Deputy City Manager and Chief Financial Officer recommend that:

1. The General Manager, Toronto Water, in collaboration with the General Manager, Parks, Forestry and Recreation Division, undertake a water use and consumption audit of all Parks, Forestry and Recreation facilities and sites in support of the City’s Water Efficiency Plan and Toronto Water’s Water Loss Reduction Strategy;
2. The water use and consumption audit noted in Recommendation #1 shall include the following:
 - a. a description of water uses at each site;
 - b. confirmation of whether water consumption is metered at each site; estimates of annual water consumption for indoor and outdoor water uses, respectively, at each site;
 - d. a listing of all sites, in order of priority based on anticipated water reduction potential, for implementation of water efficiency measures; and

- e. a listing of all unmetered sites, in order of priority based on estimated annual water consumption, to be used by Toronto Water to begin the installation of water meters in 2008;
3. As part of the annual Capital and Operating Budget submission, the General Manager, Parks, Forestry and Recreation, in collaboration with the General Manager, Toronto Water, and the Deputy City Manager and Chief Financial Officer develop a water conservation strategy for the implementation of water efficiency measures at specific sites proposed in the forthcoming year, in accordance with the priorities identified in Recommendation #2, which shall include:
 - a. an identification of specific water efficiency measures to be implemented, with special emphasis on measures identified as “municipal actions” within the City’s Water Efficiency Plan;
 - b. expected reductions in annual water consumption associated with the implementation of the identified water efficiency measures;
 - c. estimated costs associated with the implementation of the identified water efficiency measures; and
 - d. Toronto Water’s financial contribution supporting the implementation of the measures, in accordance with the funding formula established within the City’s Water Efficiency Plan;
4. The Deputy City Manager and Chief Financial Officer and General Manager of Toronto Water report annually through Toronto Water’s Capital and Operating Budget approval process on the aggregate annual water consumption from all Parks, Forestry and Recreation Division sites and facilities, tracking changes in consumption as water efficiency measures are implemented;
5. The appropriate City officials be authorized and directed to take the necessary actions to give effect thereto.

FINANCIAL IMPACT

The estimated \$100,000 (net of GST) cost to undertake the water use and consumption audit of all Parks, Forestry and Recreation facilities and sites in support of the City’s Water Efficiency Plan and Toronto Water’s Water Loss Reduction Strategy, will be cost shared between Toronto Water and the Parks, Forestry and Recreation Division.

Funding for Toronto Water’s \$50,000 contribution is available in Toronto Water’s approved 2008-2012 Capital Plan in WBS Element CPW009-13 –Water Efficiency Ancillary Costs

Funding for Parks, Forestry and Recreation Division’s \$50,000 contribution is available in Parks, Forestry and Recreation Division’s 2008 Capital budget in CPR114-35-12 Work Management Project.

Funding for the provision and installation of water meters at Parks, Forestry and Recreation facilities in subsequent years will be requested through future Capital and Operating Budget submissions by Toronto Water.

Funding for the implementation of water efficiency measures at Parks, Forestry and Recreation facilities, will be requested through future Capital and Operating Budget submissions by the Parks, Forestry and Recreation Division and will be provided by Toronto Water through the Water Efficiency Plan's capital budget as set in accordance with the funding formula established within the City's Water Efficiency Plan.

DECISION HISTORY

“In approving Toronto Water’s 2007-2011 Capital Plan and 2007 Operating Budget, at its meeting of February 5, 6, 7 and 8, 2007, City Council directed the General Manager of Parks, Forestry and Recreation and the General Manager of the Toronto Zoo, to report to the Public Works and Infrastructure Committee on the strategies of these divisions to improve water efficiency and related costs of these initiatives in support of the City’s Water Efficiency Plan and Toronto Water’s Water Loss Reduction Strategy.

The Council Decision Document regarding this request can be found at:
<http://www.toronto.ca/legdocs/mmis/2007/cc/decisions/2007-02-05-cc02-dd.pdf>

ISSUE BACKGROUND

The City of Toronto’s Water Efficiency Plan (WEP) was approved by City Council at its meeting held on February 4, 5 and 6, 2003 (Clause 29 in Report No. 1 of the Policy of Finance Committee). A copy of the Council Decision Document can be found at:
<http://www.toronto.ca/legdocs/2003/agendas/council/cc030204/pof1rpt/cl029.pdf>

The Plan’s overall objective is to achieve net water consumption reductions, to derive “in-system” capacity to support the projected population and employment growth to the year 2011, and thereby deferring the need for expensive water and wastewater infrastructure expansions. The total cost to implement the WEP, through the provision of financial incentives for the implementation of water efficiency measures, to 2011 is projected to be \$71.5 million. The cost of the Plan implementation compares favourably against the estimated \$220 million required for the equivalent expansion of water and water wastewater treatment plant infrastructure.

The Plan’s implementation schedule identifies a set of sector specific measures for implementation, together with financial incentives offered, through Toronto Water. Accordingly, a number of measures are identified for implementation within the “Municipal Sector”, which includes a Water Loss Reduction Strategy by Toronto Water; and the implementation of a series of water efficiency programs within Parks, Forestry and Recreation sites and facilities such as: Computer Controlled Irrigation Systems, Indoor Water Audits, Outdoor Water Audits, and Toilet Replacements.

A brief description of these programs is provided in the following:

Water Loss Reduction Strategy

Toronto Water is developing a Water Loss Reduction Strategy, in accordance with the International Water Association's Water Balance and Performance Indicators approach. The Strategy, expected to be completed in 2008, will estimate the City's "Infrastructure Leakage Index (ILI)" and compare this to the ILI of other water utilities and municipalities around the world; and will determine the most cost-effective approaches to reduce the City's ILI and corresponding water distribution system leakage. However, the calculation of the ILI and leakage rates is dependent on the accuracy of water consumption data. To date, not all water consumption within the City is metered, and therefore large uncertainties are introduced in these estimates. Further, Toronto Water is intending to assess its ILI and leakage rates on an annual basis to track system performance as its watermain infrastructure renewal backlog is decreased. While significant strides are being made in water metering at construction sites, through Council's recently approved Water By-Law, and through the implementation of the forthcoming residential water metering program, many City owned facilities and sites remain unmetered. Metering of sites where indoor and/or outdoor water usage is expected to be high is therefore a priority for Toronto Water.

Computer Controlled Irrigation Program

The Computer Controlled Irrigation Program will link all of the City's existing automatic irrigation systems to an existing computer controlled system which uses actual weather data to operate the systems. The computerized system provides a significant water efficiency savings (some sites have shown a 50% water saving) and off-peak irrigation capability compared to existing manually operated controllers.

Indoor Water Audits

Indoor Water Audit Program provides funding for the implementation of cost-effective water-efficiency measures or installation of equipment which are expected to provide sustained reductions in overall indoor water consumption.

Outdoor Water Audits

The Outdoor Water Audit Program is designed to improve the efficiency of existing irrigation systems by completing Certified Irrigation Audits. Audits improve the water reduction capabilities of existing irrigation methods by assessing the overall performance of existing systems and making recommendations on the required maintenance, design upgrades and proper scheduling of the system.

Toilet Replacement Program

The Toilet Replacement Program provides financial incentives for the installation of 6-litre or less flush volume toilets, replacing inefficient toilets that use on average 16.5 litres (some toilets currently use 20 litres) of water per flush cycle. Incentives are also provided for replacement of urinals with water efficient urinals.

COMMENTS

Toronto Water has met with representatives from the Parks, Forestry and Recreation Division to discuss the potential for water savings at facilities and sites. The first measure to be undertaken in 2008 is the installation of water meters throughout Parks, Forestry and Recreation facilities and sites that presently do not have meters. Toronto Water and Parks, Forestry and Recreation staff will determine the priority sites that require metering and commence the installation process. Concurrently with the metering project, staff will assess other water efficiency measures that can be undertaken.

A preliminary list of potential water efficiency actions has been prepared to assist in developing a water conservation strategy for each site within the Parks, Forestry and Recreation Division (included in Attachment 1). To date, the water efficiency measures that have been implemented include:

Computer Controlled Irrigation Systems

Approximately 30% of the irrigation systems are linked to a computer controlled system where water requirements are regulated according to weather conditions; and where notification of water leakage is provided, thereby allowing for immediate system repairs.

Water Efficient Play Areas

Timer controls have been installed on splash-pads to prevent operation after-hours; and a “water efficient” Water Play area is being designed for the Don River Park where water will be recycled for irrigation purposes.

Drinking Water Fountains

Drinking water fountains that were in constant flow have been changed to user controlled devices with an automatic stop.

Reduction in Irrigation Needs

Parks Master Plans (e.g. Centennial Park) are being developed with a goal of maximizing naturalized areas and water-efficient horticulture gardens while minimizing vegetated areas with high irrigation needs; and in many cases where sports fields are being proposed (e.g. Portlands Sports Fields) the use of artificial turf for premium sports fields is being recommended.

Indoor Actions

All new building construction and building renovations are employing the latest water conservation measures (i.e. low flow toilets, automatic shut-off faucets, low flow shower heads).

In addition to the above, a number of recent initiatives have been completed where opportunities to reduce overall water consumption at Parks, Forestry and Recreation facilities have been explored. These include:

- a) Completing a water audit for the Centennial Recreation Centre in November 2004, through Toronto Water's ICI Watersaver Program, that identified opportunities for the implementation of a number of water efficiency measures with an average payback of 2.4 years and a potential total water consumption reduction of approximately 37 cubic metres per day.
- b) Engaging Cinergy Solutions to prepare a report in May 2005, that recommended a number of water efficiency measures that could be adopted at City arenas. The report identified measures with an average payback of 3.6 years and potential water consumption reductions of approximately 261 cubic metres per day.

Based on the above, it is proposed that an important first step in supporting the implementation of the City's Water Efficiency Plan and Toronto Water's Water Loss Reduction Strategy (and developing an appropriate annual budget and schedule for the implementation of water efficiency measures at Parks, Forestry and Recreation facilities and sites); is undertaking a water use and consumption audit at each site. The water use and consumption audit should include the following:

- a) a description of water uses at each site;
- b) confirmation of whether water consumption is metered at each site;
- c) estimates of annual water consumption for indoor and outdoor water uses, respectively, at each site;
- d) a listing of all sites, in order of priority based on anticipated water reduction potential, for implementation of water efficiency measures; and
- e) a listing of all unmetered sites, in order of priority based on estimated annual water consumption, to guide the installation of water meters by Toronto Water.

Once completed, the priorities identified in the water use and consumption audit will assist the Parks, Forestry and Recreation Division, in collaboration with Toronto Water, to develop a water conservation strategy for the implementation of water efficiency measures at specific sites, as part of the annual capital and operating budget submissions for both Divisions. A critical component of determining priorities will be the installation of water meters at Parks, Forestry and Recreation facilities in 2008. Once installed, a baseline of data will be collected over a period of one year to measure results of any new water efficiency initiatives implemented. The water consumption data will also assist Revenue Services in forecasting revenues based on more accurate consumption data and this information will be part of the multi-year capital and operating budgets process.

CONTACT

Pamela Georgopoulos, P. Eng.
Manager, Service Programs
Business Unit Support
Toronto Water
Tel: 416-392-1459
Fax: 416-392-7001
E-mail: pgeorgop@toronto.ca

Michael D'Andrea, P.Eng.
Director
Water Infrastructure Management
Toronto Water
Tel.: 416-397-4631
Fax: 416-338-2828
E-mail: mdandre@toronto.ca

Anne Marra
Director
Parks Development & Infrastructure
Management,
Tel: 416-394-5723
Fax: 416-394-8935
E-mail: amarra@toronto.ca

Gord Andrews
Manager Property Management & Mtce.
Services
Tel: 416-395-7993
Fax: 416-395-7937
Email: gdandrew@toronto.ca

Josie Lavita
Director
Financial Planning
Internal Focused Services
Tel: 416- 397-4229
Fax: 416-397-4465
Email: jlavita@toronto.ca

SIGNATURES

Lou Di Gironimo
General Manager,
Toronto Water

Brenda Librecz
General Manager,
Parks, Forestry & Recreation

Joe Pennachetti
Deputy City Manager and Chief Financial Officer

ATTACHMENTS

Attachment 1: List of Potential Water Efficiency Actions Identified for Parks, Forestry and Recreation

ATTACHMENT 'A':

Preliminary List of Water Efficiency Actions (Phase I of the Strategy)

For Phase I of the strategy, Parks, Forestry and Recreation, in consultation with Toronto Water, has identified, a preliminary list of potential actions in order to achieve an efficient use of water in the city's parks, forestry and recreation facilities:

I. Outdoors:

1. Enhancement in quality and coverage of Computer Controlled Irrigation:
 - Identify current coverage, quality and type of Computer Controlled Irrigation
 - Identify potential to upgrade and replace existing computerized irrigation systems
 - Identify potential for adding new parks to the existing computerized system.
 - Identify potential and need for the development of new computerized systems.

2. Certified Irrigation Audits
 - Determine if there is a need for conducting certified irrigation audits in irrigated Parks.
 - If a need is identified, analyse costs and benefits of training/ certifying staff to carry out the audits in-house, versus contracting them out.

3. Scheduling of irrigation and other watering uses to off-peak periods

4. Improvement in maintenance and repair of existing outdoors water systems.
 - Examine existing outdoor water systems (irrigation systems, drinking and ornamental fountains, water plays, etc), to identify pending repairs.
 - Survey sprinkler heads to examine functionality and proper size.
 - Create a scheduled on-going maintenance program for the outdoor water system.

5. Conversion of Ornamental Fountains
 - Audit existing ornamental fountains and calculate number of items to be converted to a recirculation system.
 - Explore possibility of converting all ornamental fountains to recirculation systems.

6. Development of water-efficient water plays.

- Identify potential opportunities for the development of efficient water plays (i.e. with water re-cycling for irrigation purposes).
- Develop a pilot project to monitor water use and calculate actual costs and savings of these innovative systems.

7. Rainwater re-use for irrigation

- Research national and international experiences in the storage of significant volumes of rainwater (e.g. on rooftops and/or storage tanks) and its re-use for irrigation.
- If feasible, identify potential opportunities for rainwater storage and recycling in new buildings or expansions of existing buildings.

Note: Rain barrels have been proven to be a good stormwater management strategy but not an effective water efficiency measure. Through this action, bigger storage areas will be explored.

8. Reduction in watering/ irrigation needs through adequate selection of vegetation and ground cover.

- Identify existing lawn or turf areas that can be naturalized to reduce irrigation needs.
- Design new horticulture gardens to be water efficient (utilizing plants with low watering requirements).
- Explore possibility of replacing existing gardens having high watering requirements, with more water efficient gardens.
- Identify potential opportunities for installing artificial turf on existing and planned premium sport fields.

II. Indoor:

1. Installation of city-selected water efficient toilets and urinals.

- Survey existing toilets and urinals in recreation facilities and calculate the number of fixtures to be replaced with water efficient models.
- Install water efficient toilets and urinals in an opportunistic manner, as replacement is required.
- Install water efficient toilets and urinals in new facilities (as per Ontario Building Code)

- Explore possibility of replacing all toilets and urinals in a proactive way.

2. Indoor Water Audits

- Conduct indoor water audits in recreation facilities to identify additional opportunities for water efficiency.

III. Public Education:

1. Implementation of programs to create awareness

- Identify potential public education programs to create awareness on water efficiency (e.g. demonstration gardens, signage, summer programs, events, etc)

IV. Water Meter Installation:

1. Meter water use in parks and recreation facilities to establish a baseline and be able to monitor savings (compare pre and post water consumption):

- Identify which parks and facilities have water service but are currently unmetered.
- Identify which existing water meters are currently read and recorded and which are not.
- Install water meters at sites and facilities where no meters exist.
- Examine the advantage and feasibility of sub-metering sports fields.