

SUSTAINABLE MUNICIPAL WATER MANAGEMENT

Our Water is Worth It!



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CONTENTS

Page	Section
2.	Introduction
3.	Six Principles of Sustainable Municipal Water Management
4.	Durham Region's Role in Sustainable Water Management
4.	Durham Region's Commitment to Sustainable Municipal Water Management
5.	Sustainable Municipal Water Management Progress Indicators
7.	Principle 1: Conserving Water
8.	Principle 2: Shared Water Stewardship
9.	Principle 3: Enjoying our Shorelines and Waterways
10.	Principle 4: Preventing Pollution
11.	Principle 5: Water Protection Planning
12.	Principle 6: Preparing for Climate Change
13.	Other Resources



Introduction:

We can't live without fresh clean water. Durham residents are fortunate to live next to the largest supply of fresh water in the world, the Great Lakes. However, this privilege comes with the responsibility to respect and protect this resource.

As a member of the Great Lakes St. Lawrence Cities Initiative (GLSLCI), Durham Region is participating in a pilot project on Sustainable Municipal Water Management. The purpose of this report is to share information with the community about the work the Region does, highlight broader community efforts, and invite stakeholders to get involved in caring for and connecting with this great gift of nature, water.

As the operator of Durham's drinking water supply and wastewater treatment systems, the Region plays a key role in managing water resources sustainably, but we don't do it alone. Stewardship of our water resources requires collaboration and we have many partners in this task.

Durham area municipalities regulate land use, operate stormwater management systems and maintain parklands. Our conservation authorities provide watershed planning, flood control, ecosystem protection and recreational opportunities. The provincial and federal governments also play significant roles in protecting shorelines, water quality and quantity, and aquatic ecosystems in our lakes and rivers. Many of our provincial and national parks are centred on a lake or river system. There are bi-national efforts between Canada and the United States to protect the Great Lakes from pollution and invasive species and to clean up historical areas of concern. Our most important partners are Durham residents—using water wisely! Managing our water resources sustainably is a shared responsibility.

In the body of this report, we highlight progress made in the Region of Durham on key indicators established by the GLSLCI to illustrate six principles outlined in their Sustainable Municipal Water Management Framework. We hope you find this report informative and encouraging.



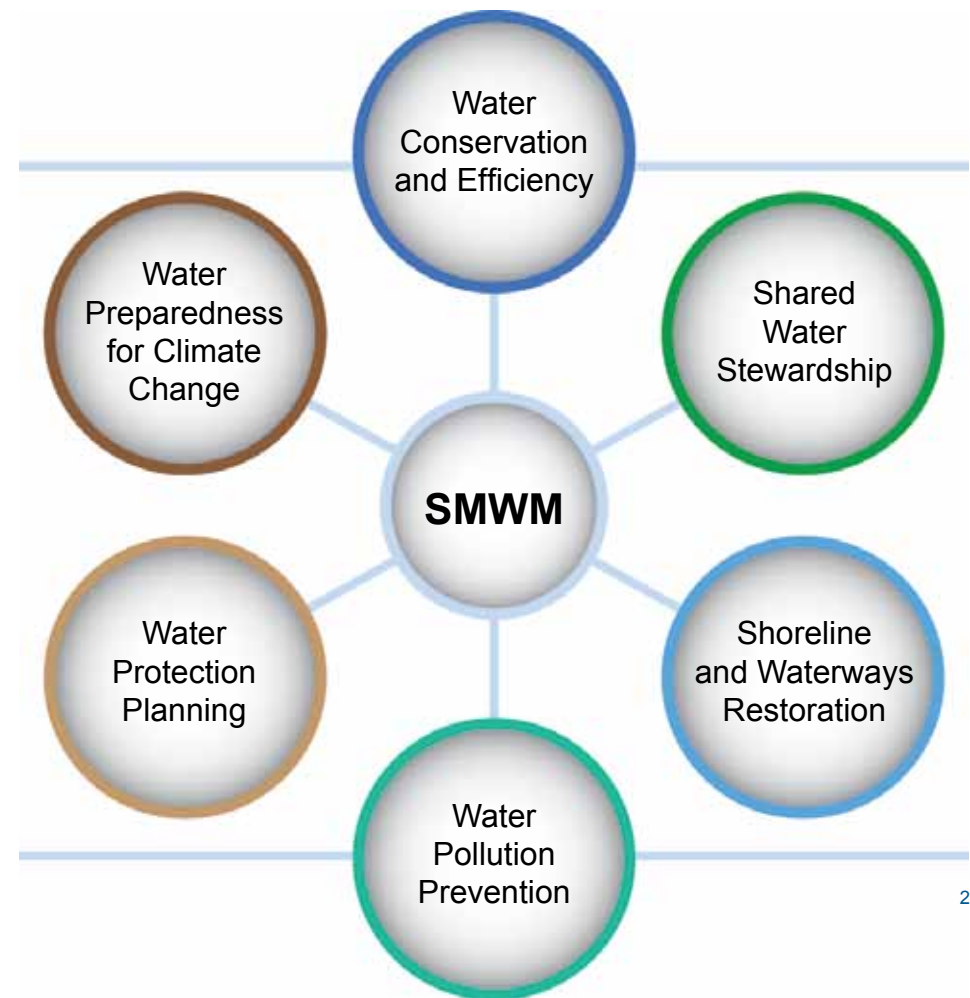
***Find more information about the
Great Lakes St. Lawrence Cities
Initiative at www.glslcities.org***

Six Principles of the Great Lakes St. Lawrence Cities Initiative Sustainable Municipal Water Management (SMWM) Framework

“The Great Lakes and St. Lawrence Cities Initiative (GLSLCI) is a bi-national coalition of mayors and other local officials that works actively with federal, state, and provincial governments to advance the protection and restoration of the Great Lakes and the St. Lawrence River.”¹

The six principles provide a framework for thinking about our work in protecting water resources. A group of municipalities from Canada and the United States developed indicators based on these principles as a way for municipalities to monitor the progress of their efforts over time. Municipalities may play different parts in water management depending on their jurisdictional role. For example, in Durham’s two-tier governance system, the Region is responsible for the collection and treatment of sanitary sewage but local municipalities have primary responsibility for stormwater.

Durham Region’s progress is illustrated on the chart on page six. Gathering the information for this project confirmed that caring for our water resources is a joint effort involving our area municipalities, conservation authorities, community groups and citizens. We must work together to be effective.



¹ From <http://www.glslicities.org/aboutus.cfm>.

² Graphic from Sustainable Municipal Water Management: Measuring Progress and Reporting Publicly. A Green CiTTS Report, June 2012, The Great Lakes and St. Lawrence Cities Initiative. The full report is available on the GLSLCI website at: http://www.glslicities.org/greencities/SMWM/SMWM_Green%20CiTTS%20Report.pdf

Durham Region's Role in Sustainable Water Management

Durham Region operates 14 water supply systems. Continuous monitoring equipment at all local systems is connected wirelessly to a main monitoring post at the Ajax Water Supply Plant to ensure that our drinking water always meets Ontario's strict quality standards.

In 2013, almost 201,000 residential units (including those in apartments and condominiums) were supplied by the Regional water system. Despite the 16 per cent increase in Durham's population in the past decade, total water production in 2013 was 12 billion gallons (54,550 ML), down from 14 billion gallons (63,645 ML) in 2003, showing the impact of conservation efforts and education. Durham has been an active participant in the development of source protection plans for the Region. Regional Risk Management Officials are working with residents and businesses to reduce threats to municipal drinking water sources.

Durham Region's 11 wastewater treatment plants are designed to prevent human waste and pathogens from entering water bodies. Systems to manage urban stormwater are primarily managed by the local municipalities.

Our Commitment to Sustainable Municipal Water Management

Sustainability is the guiding principle in the Durham Region Strategic Plan, adopted in 2009. Goal 2.4 of the plan is "to protect the quality and quantity of ground and surface water". The Region's Official Plan contains provisions that protect vulnerable aquifers, wellhead protection areas, natural heritage, the Lake Simcoe basin ecosystem, farmland and greenspace in accordance with Ontario legislation including: the *Oak Ridges Moraine Conservation Act*, the *Greenbelt Act*, the *Lake Simcoe Protection Act* and the *Clean Water Act*.

The Region plans for the long-term sustainable financing of our water and wastewater infrastructure through servicing and financing studies for the growth of the systems and a user rate study for the existing systems which are updated and approved by Council annually. The Region also is committed to watershed protection, contributing more than \$6 million each year to help fund the work of our five conservation authorities.

The Region has a Community Climate Change Local Action Plan and work on an Adaptation Plan is underway to help us deal with anticipated impacts such as extreme weather. The Region also has a Corporate Climate Change program to mitigate the effects of Regional activities and adapt to impacts on our infrastructure and operations.

Durham Progress on Sustainable Municipal Water Management Indicators

PRINCIPLES	MILESTONES	TRENDS	INDICATOR KEY	
1. WATER CONSERVATION AND EFFICIENCY	Promote Water Conservation		Milestone completed	✓
	Install Water Meters	✓	Significant progress	
	Set the Right Price		Stability or moderate progress	
	Minimize Water Loss		Not applicable (goal not adopted or not under Regional authority)	
	Increase Water Reuse and Recycling			
2. SHARED WATER STEWARDSHIP	Raise Public Awareness			
	Engage the Public			
3. SHORELINE AND WATERWAY RESTORATION AND ACCESS	Protect and Restore Shorelines/Riparian Areas			
	Increase Public Access to Shorelines, Riverbanks, Waterfronts			
	Protect Habitats and Biodiversity			
4. WATER POLLUTION PREVENTION	Prevent Pollutants from Entering the Sewage Collection System			
	Reduce Pollutants from Wastewater Treatment Plant Effluent			
	Reduce Stormwater Entering Waterways			
	Monitor Waterways and Sources of Pollution			
	Improve Beach Quality			
5. WATER PROTECTION PLANNING	Adopt Council-endorsed Commitment to Sustainable Water Management	✓		
	Integrate Water Policies in Land Use Plan			
	Collaborate on a Watershed Scale			
	Adopt Green Infrastructure			
6. WATER PREPAREDNESS FOR CLIMATE CHANGE	Conduct a Vulnerability Assessment	✓		
	Reducing Vulnerability – Adaptation Plan			
	Reduce Greenhouse Gas (GHG) Emissions			

Principle 1 - Conserving Water

Milestones:

- 100 per cent of Durham Region water customers are on water meters since 1978.
- User fees aim to recover 100 per cent of system costs annually.
- Since 2005, 8,000 leak-prone polybutylene water connections have been replaced to stop or prevent water loss.
- From 1996 to 2007, the Region assisted homeowners to replace 10,000 older toilets with lower flow models.

Highlights:

In the past decade (2003-2013):

- Customer water use (litres per day) has declined from 868 to 660, a drop of over 20 per cent.
- Large industrial consumption has declined by 70 per cent.
- Since 2008, Durham's daily water loss per kilometre of pipe length in the system has declined by 1.39 cubic metres (OMBI data³).

Story behind the numbers:

Paying for what we use encourages households and industries to reduce their water consumption. Durham Region aims for full cost recovery of water rates including:

- Building and maintaining system infrastructure.
- Having qualified staff and modern technology.
- Testing and monitoring water quality to ensure it always meets or exceeds the provincial and federal standards.
- Purchasing supplies needed for treatment.
- Energy costs to operate the plants and pumping systems.

Household water use has declined due to widespread adoption of low flow toilets and showerheads, more water-efficient appliances, fixtures and water-wise behaviours.

Continuing to improve:

Useful tips for conserving water are just a click away under the "water efficiency" link at www.durham.ca.

A 10-year, \$120 million program will replace failing polybutylene water connections to reduce water loss. In addition, the Region preserves its watermains with cathodic protection and cement pipe lining programs.

³OMBI is the Ontario Municipal Benchmarking Initiative For more information visit the OMBI website at <http://www.ombi.ca/>.

Principle 2 - Shared Water Stewardship

Milestones:

In 2013, water information was shared with the public via:

- More than 50 durham.ca webpages including the Region's annual water system performance report
- 30 media releases related to water topics
- Two issues of "Durham Works" newsletter distributed to about 215,000 Durham households

Two thirds of Regional Councillors serve on Conservation Authority Boards, providing a key link to watershed management.

Community Engagement:

Several citizen committees advise Regional Council on issues related to water resources:

- Durham Nuclear Health Committee
- Durham Environmental Advisory Committee
- Durham Region Roundtable on Climate Change
- Durham Agricultural Advisory Committee
- Durham Trails Co-ordinating Committee

Durham's eight area municipalities and five conservation authorities all play key roles in protecting water resources through their planning, operations and infrastructure.

Highlights:

In 2013, 4,200 Grade 4 students attended the Central Lake Ontario Conservation Authority Children's Groundwater

Festival. Since 1998, 64,000 students have participated.

World Water Day is marked at Regional Headquarters each March.



Story behind the numbers:

The Region provides funding (\$6.65 million in 2013) to support the work of our five conservation authorities and actively partners with them on watershed protection. Many community groups also contribute to the effort of protecting shorelines, wetlands, fish and wildlife.

Detailed reporting to Council and the public on our water and wastewater systems is published annually in the Region's asset management study, servicing and financing study and user rate report.

Continuing to improve:

Regular communications with residents of wellhead protection areas will be implemented as part of the Source protection program in 2014.

Principle 3 - Enjoying our Shorelines and Waterways (Restoration and Public Access)

Milestones:

The Regional Official Plan designates 81,500 hectares as natural heritage areas to protect ecological values. Many of these areas are valleylands and wetlands.

Over the past decade the Region contributed \$6.5 million to help purchase 3,520 hectares of conservation lands valued at more than \$27 million.

Public access to waterways and shorelines includes:

- About 268 kilometres of the Regional trail network are located beside a water course or shoreline.
- 14 public beaches, 15 conservation areas, Darlington Provincial Park on Lake Ontario and Rouge Valley National Urban Park.
- A number of public and private marinas and many local parks and trails near lakes, streams, ponds and wetlands.

Highlights:

Since 2003, the Durham Region Environmental Advisory Committee has recognized local shoreline, stream bank, wetland and waterfront preservation and restoration efforts as well as innovation in water technology and watershed education efforts with their annual Environmental Achievement Awards.

Story behind the numbers:

The Region created a reserve fund that has assisted our Conservation Authorities to purchase lands of natural heritage value. Hydrologic features are a key criteria considered in the purchases of properties that are then cared for by the Conservation Authorities.

Durham's local municipalities create land use plans and undertake programs to restore and enhance their waterfronts. They also provide recreational opportunities for residents.



Continuing to improve:

In 2013, the Region launched an interactive online map of the trail network accessible on newer handheld devices, with full descriptions of trail facilities and viewing options.

A section of Ontario's waterfront trail along Lake Ontario between Whitby and Ajax will be relocated closer to the lake and improved by 2015.



Principle 4 - Preventing Pollution

Milestones:

Wellhead protection areas have been delineated around 23 Regional wells and intake protection zones identified for 6 lake-based water sources,

Salt management plans are in place for Regional roads to reduce the amount of salt entering ground and surface waters.

In 2013:

- Durham's Sewer Use By-law which regulates industrial wastewater entering the system was strengthened.
- 337 residents dropped off eight tonnes of household hazardous waste at special collection events.
- 99.9 per cent of Durham drinking water samples met or surpassed provincial water quality standards for bacterial parameters (i.e. E. coli, total coliform).

The Region invested \$25.9 million for upgrades at the Harmony Creek and Nonquon Water Pollution Control Plants (WPCP) while also allocating \$8.4 million to expand systems in Pickering, Whitby and Courtice. Almost \$165.0 million was committed for Stage I and II refurbishment of the Duffin Creek Water Pollution Control Plant, in the City of Pickering.

Story behind the numbers:

The Region's 11 wastewater treatment plants prevent human waste and other contaminants from entering water bodies.

Highlights:

Since 1999, Durham has participated in the National Water and Wastewater Benchmarking Initiative to monitor key water and wastewater performance indicators on an annual basis.

In 2012, Durham set a Guinness world record for collection of used batteries (5,090 kilograms) in a 24 hour period. Regular e-waste collections events are held to prevent heavy metals and toxins from entering water sources.

With other municipalities, the Region made a submission to the hearing on the Enbridge Line 9 flow reversal project, requesting proper spill prevention and emergency planning to protect Lake Ontario.

Continuing to improve:

Ongoing capital upgrades will continue to improve the standard of wastewater treatment at Regional plants.

Since 2003, Durham Region has been a funding partner in University of Waterloo research on advancing treatment and reducing risk in water treatment.

The Region, in conjunction with other municipal partners, has funded research in new technologies and developing expertise in drinking water treatment and delivery conducted by the Department of Civil Engineering at the University of Toronto since 2008.

Principle 5 - Water Protection Planning

Milestones:

Five source protection plans prepared for the Region's watersheds await Provincial approval.

Our *groundwater* monitoring program tracks water quantity and quality in 115 observation wells across Durham.

80 per cent of Durham Region is in Ontario's greenbelt which strictly limits new urban development.

The 1,477 acre Durham Forest owned by the Region is a sustainably managed woodland with trails and an outdoor education centre.

The Regional Official Plan contains a forest cover target of 30 per cent. Over the past six years, woodlands have grown from 24 per cent to 27 per cent of the Region's land base.

Highlights:

In 2013, the Region trained and appointed risk management officials and inspectors to prepare for implementation of source protection plans in 2014.

Story behind the numbers:

Working since 2002 with the conservation authorities, the Region has completed watershed plans for all 27 watersheds flowing off the Oak Ridges Moraine.

Continuing to improve:

Durham Region continues to work with the conservation authorities to ensure up-to-date watershed plans.

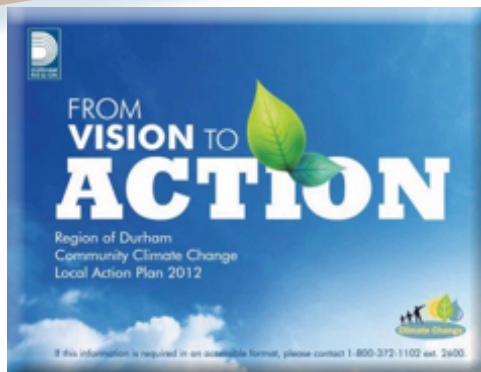
The Region is developing a strategy to significantly increase tree cover by 2023 to help retain water in soils, slow runoff, sequester carbon and provide shade.



Principle 6 - Preparing for Climate Change

Milestones:

In 2012, the Region finalized a community based action plan to help address the causes of climate change.



In 2013, 56 businesses underwent eco-efficiency audits and 11 retrofits were completed.

The Region has had a corporate climate change plan to identify and implement changes in Regional operations since 2009 and reports to Council annually on progress.

In 2012, the Region reduced its GHG emissions by using digester gas produced from the wastewater treatment process to fire boilers, saving 1.15 million cubic metres of natural gas.

Highlights:

In 2013, the Region completed a study modelling the forecast climate in Durham Region for the next 30 years. Durham participated in International Council for Local Environmental Initiatives' (ICLEI) Canadian Adaptation Initiative to develop a Corporate Climate Adaptation Plan. Regional operations and programs were assessed to determine their ability to cope with the effects of climate change as basis for the adaptation plan.

Continuing to improve:

Climate change considerations are now built in to future capital planning for all new Regional facilities and infrastructure.

Region continues to seek energy savings at water and sewer plants by optimizing pumping operations as plants are renewed.

The Region has begun work on developing a Community Climate Change Adaptation Plan.

Find more information about the Durham Region Community Climate Change Local Action Plan or calculate your carbon footprint using the tools available at: www.durham.ca/climatechange

Other Resources



The Regional Municipality of Durham
www.durham.ca

Great Lakes St. Lawrence Cities Initiative
www.glslicities.org

Central Lake Ontario Conservation Authority
www.cloca.ca

Lake Simcoe Region Conservation Authority
www.lsrca.on.ca

Toronto and Region Conservation Authority
www.trca.on.ca

Kawartha Conservation Authority
www.kawarthaconservation.com

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Connect with the Region of Durham:

Website: www.durham.ca

Facebook: <http://www.facebook.com/regionofdurham>

Twitter: <http://www.twitter.com/regionofdurham>

YouTube: <http://www.youtube.com/user/regionofdurham>

