Opportunities to Promote Innovative Stormwater Management

Water Opportunities Act, 2010

Technical Workshop – Stormwater Management and Coastal Protection
Great Lakes and St Lawrence Cities Initiative

June 16, 2011

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Purpose of Presentation

- To encourage opportunities for innovative municipal stormwater management for the protection of the Great Lakes
  - Water Opportunities Act
  - Stormwater management - policy review
  - Opportunities
  - Current initiatives

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Background - Great Lakes Basin

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Ontario's Water Opportunities Strategy

- Ontarians have access to a clean, safe supply of water
  - abundant water resources; however the Great Lakes are renewed at a rate of only one percent per year
  - custodians of four Great Lakes, 225,000 inland lakes, 500,000 km of rivers and streams
- Threats to water sustainability are increasing. Many parts of the world have limited water resources
  - water scarcity and drought
  - access to clean drinking water
  - increasing demand for water for agriculture to feed growing global population
- Demand for water solutions is growing - a huge business opportunity for our small, but innovative water technology sector
- Global water sector is valued at $1 Trillion by 2020

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Overview of the Strategy

- The strategy is a key part of the government's Open Ontario plan to make Ontario the leader in clean water technology and services
  - builds on the Green Energy and Green Economy Act, created to expand Ontario's production of renewable energy, encourage energy conservation and promote the creation of clean-energy green jobs
- Key components of the strategy include:
  - new legislation
  - funding support to drive innovation and commercialization in the water sector
  - Ontario's Global Water Leadership Summit
- Multi-ministry collaboration (Infrastructure; Municipal Affairs and Housing; Environment; Research and Innovation; Economic Development and Trade; Agriculture, Food and Rural Affairs; Natural Resources; Training, Colleges and Universities)

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Water Opportunities Act - Key Outcomes

- In 2010 the government passed the Water Opportunities and Water Conservation Act
  - Make Ontario a North American leader in developing and selling water technologies and services through the creation of the Water Technology Acceleration Project
  - Strengthen sustainable municipal water infrastructure planning by helping municipalities identify and plan for long term infrastructure needs
  - Encourage Ontarians to use water more efficiently by creating and implementing innovative approaches to conservation

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Water Opportunities Act - Stormwater Management

- The purposes of the act are:
  - to foster **innovative** water, wastewater and **stormwater technologies, services and practices in the private and public sectors**
  - to create opportunities for **economic development** and clean-technology **jobs** in Ontario
  - to **conserve and sustain water resources** for present and future generations

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Water Opportunities Act - Sustaining Municipal Water Infrastructure

- Enables the authority to require municipalities and other water service providers to prepare **integrated** municipal water sustainability plans for **water, wastewater and stormwater infrastructure**

- Enables the authority to establish **performance indicators** (e.g., leakage, metering, and investment in infrastructure) to **monitor progress and communicate results**

Belleville Wastewater Treatment Plant

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Water Opportunities Act - Sustaining Municipal Water Infrastructure

- Prescribed entities would prepare a municipal water sustainability plan which may include:
  - an asset management plan
  - a financial plan
  - a water conservation plan
  - a risk assessment (vulnerability to climate change)
  - strategies for maintaining and improving the service
  - other prescribed information

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Stormwater Management – Policy Review

- An MOE stormwater policy review was completed in 2010 in response to an Environmental Bill of Rights (EBR) Application for review
  - Adaptation to climate change is a priority for Ontario
  - Emphasis is on **source control** – reuse and LID (Low Impact Development/GI (Green Infrastructure)
  - A **collaborative process** with municipalities and the private sector is required to update **technical guidance**
  - Innovative **solutions for data collection** are needed to asses Ontario's vulnerability to climate change and aid adaptive decision-making for infrastructure renewal
  - Programs such as **public education**, **demonstration projects** and **incentives** are essential to support resilient systems

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Stormwater Management - Link to Climate Change

Peterborough, July 2004

Water Quantity

Water Quality

Climate Change

- Expect increased frequency and intensity of storms
- Potential for increased drought

Climate Change Science Evolving

- Adaptation decisions needed now

Sources: Google, City of Toronto; Friends of the Rouge Watershed, TRCA

Toronto, August 2005

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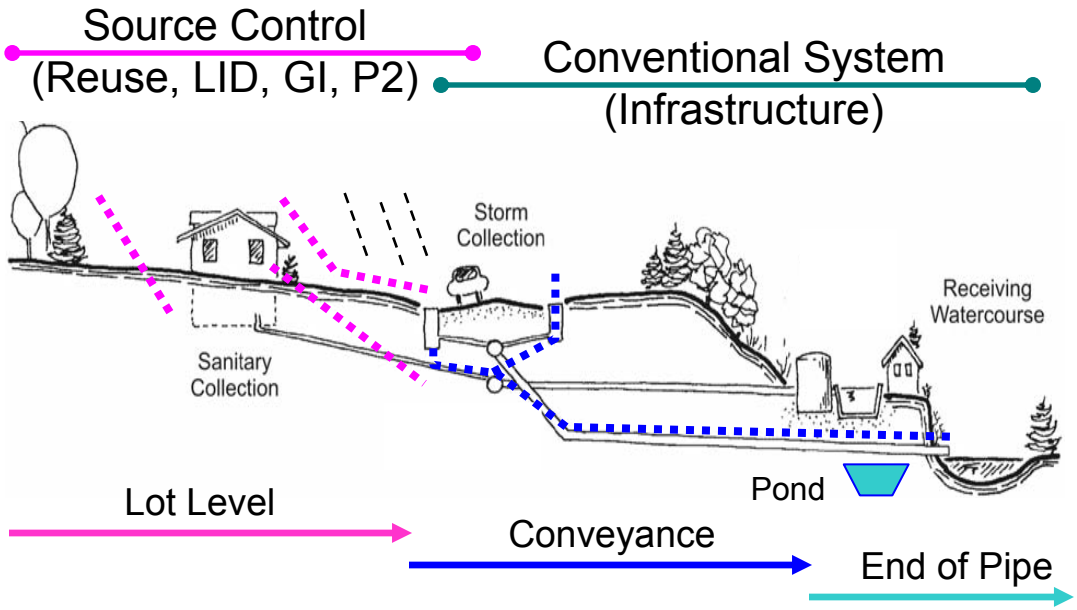
Stormwater Management - Municipal Role



- Municipalities are the practitioners - planning, design, build and operations
- Past MOE focus on the portion of the stormwater collected and managed through the conventional system (e.g. storm sewers, wet ponds)
- It is not the major system for managing overland flow

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Stormwater Management - Opportunities Identified

- **Reduce** the generation of stormwater by building urban communities that interfere less with the natural water cycle
- **Reuse** stormwater for watering landscapes or another purpose e.g. toilet flushing
- **Recycle** clean stormwater back into the natural water cycle by infiltration or by release to surface water (e.g. recharge, base flow)
- Stormwater is an alternative water source. It is not just a flood water risk that must be expediently removed from properties. Fundamental shift in attitude needed to support water conservation

- Long term planning approach to strengthen environmental protection
  - Water quality and quantity cumulative impacts on watersheds and groundwater
  - Infrastructure assessment and adaptation for climate change

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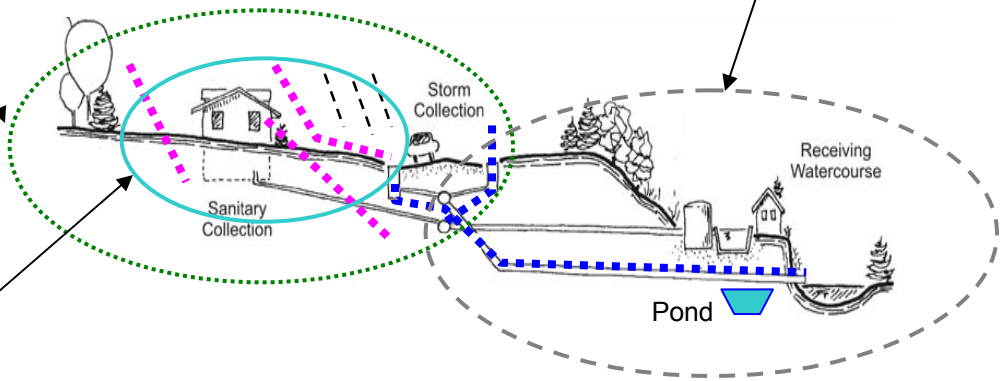
Stormwater Management - Source Control

1) Build on Conventional Systems

2) Source Control - Reuse and LID/GI

- Road right of ways, public and private land



3) Private Properties - Collaboration on Reuse and LID/GI

- Residential, industrial, commercial and institutional
- New development and retrofitting established neighbourhoods

Reduce Quantity

Improve Quality

Resilient to Changing Climate

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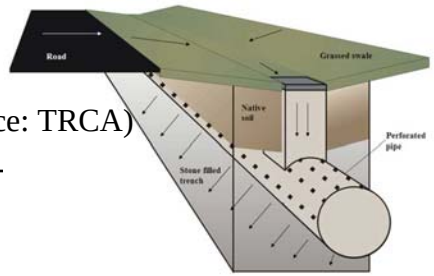
Stormwater Management - Success Stories



(source: TRCA)

Ottawa - grass swales & pervious pipes in neighbourhood

- >20 years old; 75-85% of run-off volume reduction

Seattle - SEA street retrofit

- bioretention, street design and other features
- 99% reduction of stormwater run-off

(source: Seattle, USA)

Ottawa - Minto's Eco-home demonstration

- 50% reduction through water conservation features
- 75% reduction (total) with stormwater reuse added

(source: Minto)

Toronto - stormwater reuse for toilets in condominium

Toronto - green roof on commercial property

(Source: Minto)

Guelph - on-site management on industrial facilities

- 1 in 100 year return storm, e.g. Infiltration basin

(source: MOE)

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(source: Mountain Equipment Co-op)

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Stormwater Management - Supplemental Technical Guidance

- 2003 Stormwater Planning and Design Manual
  - SWM Manual is still relevant
  - Ongoing development of supplemental technical guidance as new science and approaches emerge
- Current Initiatives
  - Working with TRCA on particle size distribution – OGS
  - Beginning work on technical guidance related to low impact development (LID)
  - Reuse water quality
- Role of municipal or industrial BMPs
  - Demonstrations of innovative reuse and LID

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Stormwater Management - Incentives to Drive Innovation

- Ontario Small Waterworks Assistance Program Phase 3:
  - On May 17, 2011, the Ministry of Research and Innovation announced that there are 85 recipients of funding through the OSWAP 3. OSWAP 3 was launched in 2010 and will provide up to $50 million in capital assistance to help small municipalities improve water conservation and water and wastewater system efficiency
- Innovation Demonstration Fund Water Round:
  - Focuses on the commercialization and demonstration of water technologies and assists water technology companies with the potential to be globally competitive by demonstrating their innovative technologies in Ontario
- Ontario Research Fund-Research Excellence program:
  - Includes a focus on the development of water-related solutions, and recently concluded a competition for research projects in water and wastewater technologies
- New Directions Research program:
  - Focuses on five treatment technologies in greenhouses, developing industry guidelines for efficient water use in on-farm dairy systems, and finding new uses for wastewater from biodiesel production
- Ontario Water Innovation Award:
  - A one-time award designed to recognize excellence, outstanding performance, entrepreneurship and leadership in developing a commercially successful water technology related to the conservation and/or treatment of water

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Stormwater Management - Incentives to Drive Innovation

- MOE Minister's Award for Environmental Excellence:
  - A new award recognizing local green achievement, leadership and innovation. For 2011, awards are focused on toxics reduction and water including water innovation, conservation, Lake Simcoe and drinking water protection
- Ontario Budget March 2011:
  - $30 million over 3 years announced for Showcasing Water Innovation program, support for Municipal Water Sustainability Planning and education and awareness of water conservation
    - Showcasing Water Innovation:
      - A merit-based funding program that will provide $17 million for community demonstration projects that showcase early adoption of innovative and cost effective approaches and technologies for advancing integrated and sustainable water management in Ontario communities
      - Application deadline June 24, 2011
      - For more information contact: waterInnovation@Ontario.ca

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Stormwater Management – Collaboration, Sustainability, Innovation, Adaptation

- Great Lakes and St. Lawrence Cities Initiative
  - June 1, 2010 - Ministers and Mayors' summit
  - Committed to joint projects to assist municipalities to reduce the amount of stormwater entering the lakes
- City of Welland COA project
  - Public Infrastructure Engineering Vulnerability Committee (PIEVC) Climate Change Risk Assessment for Municipal Stormwater and Wastewater Infrastructure and Services
  - Use the Engineers Canada's PIEVC Protocol for the first time on a full scale with a larger municipality in Ontario to assess the risk of climate change for municipal stormwater, sanitary and combined sewer systems and to update the local rainfall IDF curve for climate change
- City of Hamilton COA project
  - Innovative Source Control Stormwater Management for Business or Industrial Park Development
  - Produce a document that would assist municipalities to develop or approve a business or industrial park development with innovative stormwater management (reuse and LID)

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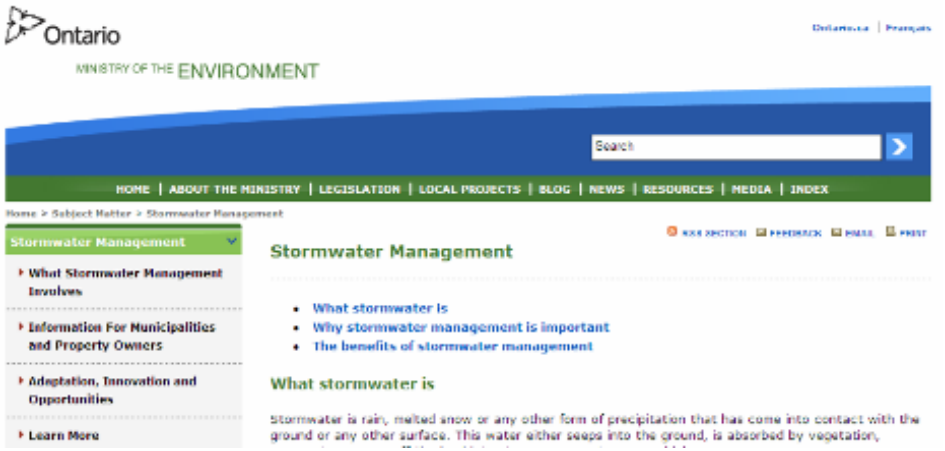
Final Thoughts - Sharing Ontario's Experience

Opportunities
Innovation
Collaboration
Sharing Knowledge

- MOE stormwater web site
  www.ene.gov.on.ca

- Innovative Stormwater Management Practices
  www.iswm.ca



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