

# H<sub>2</sub>Ontario



## A BLUEPRINT FOR A COMPREHENSIVE WATER CONSERVATION STRATEGY

### Version 1.0

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## WHY A BLUEPRINT, WHY NOW?

Jurisdictions around the world are increasingly recognizing that sound water management is the foundation for economic and community prosperity. Ontario is beginning to take notice and is committing to new approaches to water management, from source protection to modernizing municipal infrastructure to improved protection of lakes, streams and rivers.

The Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement, signed by Ontario with nine other Great Lakes jurisdictions, requires each state and province in the basin to establish water conservation goals, objectives and programs. Implementation of the recommended actions in A Blueprint for a Comprehensive Water Conservation and Efficiency Strategy would position Ontario as a regional leader on conservation.

This Blueprint is being released in anticipation of the Province's Water Conservation and Efficiency Strategy. The signatory groups are supportive of the input contained in this Blueprint and will participate in the Province's dialogue regarding water conservation and efficiency as it evolves.

Part I provides background and context to the Blueprint, and outlines why a commitment to a comprehensive water conservation and efficiency strategy is so urgently needed. It discusses the benefits of conserving water – including economic, energy reduction, and environmental protection benefits – and outlines opportunities to build on the existing foundation of water conservation policies and practices in the province. It concludes by offering a vision for a sustainable water future for the province.

Part II begins with a summary table of a Blueprint for a Comprehensive Water Conservation and Efficiency Strategy to achieve that vision, including priority areas, actions, and key actors needed to make them happen. A detailed discussion of each of the elements of the Blueprint follows.

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# PART I - BACKGROUND AND CONTEXT

## Why Conserve Water?

While we are surrounded by four of the largest lakes on the planet, a closer examination demonstrates that Ontario's water resources are not as abundant as we perceive. The Great Lakes are essentially a relic: a one-time gift of the glacial melt that occurred at the end of the last ice age. They replenish at an average rate of only one percent per year and are a fragile ecosystem in delicate balance.<sup>1</sup> Relatively minor changes to their natural cycles and fluctuations can cause major disruptions to ecosystem function that will impact the human populations that depend on them for drinking water, industrial production, and recreation. Biodiversity in the Great Lakes is already at risk. Human intervention now can avoid future detrimental impacts on aquatic and other wildlife species dependent on the waters of the Great Lakes.

Compared to other jurisdictions with similar living standards, Ontarians waste large amounts of water. On average, the per capita residential use of water in Ontario is 260 litres per day, close to twice the amount used in many European countries including the United Kingdom and Germany.<sup>2</sup> In the summer, municipal water use doubles in many communities as treated water is used for lawn watering, washing cars, or filling swimming pools.

The Environmental Commissioner of Ontario has noted a "heightened concern" about water withdrawals in Ontario and a number of Ontario's watersheds are showing signs of serious ecological stress. In 2007, seven conservation authorities had watersheds in Level II low water condition and in recent years Spencer Creek in southwestern Ontario has "disappeared temporarily because of excessive water takings."<sup>3</sup>

Several communities in Ontario, such as the Regional Municipality of Waterloo and the City of Guelph, are located away from the lakes and depend heavily on groundwater. Groundwater supplies typically have a limited, and often unknown, sustainable groundwater yield, and yet a number of these communities have also been identified by the Province as new growth regions.<sup>4</sup> The pressure for growth is resulting in what the Environmental Commissioner of Ontario calls "irreconcilable priorities", which pit accommodating population increases against respecting the carrying capacity of the watersheds in which these communities are located.<sup>5</sup>

Climate change is another significant challenge. While Ontario's Greater Golden Horseshoe is projected to grow by an additional 4 million people by 2031 – equivalent to creating a mid-sized city roughly the size of Kitchener every year for the next 23 years<sup>6</sup> – climate change is predicted to diminish water supplies in southern Ontario as a result of higher evaporation rates and less snow and ice cover in the winter.<sup>7</sup>

Simply put, not only is there not as much water in Ontario as we think but rising demands for water are on a collision course with declining water source availability.

## Benefits of Conserving Water

Water conservation and efficiency are “no-regrets” strategies that can stimulate the economy, reduce energy needs, and help protect the environment. For the purpose of this report, water efficiency is defined as providing the same service more efficiently – using less water – for example by installing efficient toilets, faucets, and showerheads. Water conservation is defined as modifying the actual service to use less water, such as planting native, drought tolerant plants instead of water intensive turf, taking shorter showers, and reusing water in industrial processes.

### Stimulating the Economy

Investing in water conservation and efficiency creates green jobs, prevents unnecessary government spending, and spurs innovation.

- ∞ **Green Jobs** - Based on an economic study conducted by the Alliance for Water Efficiency (AWE), investments in water efficiency as a form of economic stimulus can be quickly deployed to yield 15,000 to 22,000 new jobs for each \$1.2 billion invested.<sup>8</sup> Importantly, these are jobs that cannot be outsourced outside of Ontario, in service sectors such as plumbing, landscaping, engineering, construction and design, and in manufacturing sectors involved in supplying everything from rain barrels to dishwashers.
- ∞ **Cost Savings** - Ontario is struggling to keep up with the maintenance of existing water infrastructure. An estimated \$25 billion is needed over the next 15 years to repair and update the province’s aging water infrastructure.<sup>9</sup> Public funds are therefore needed to focus on maintenance as opposed to building new expensive and energy-intensive pipes and pumps for growing populations. Fortunately, water efficiency frees up new water, stretching the capacity of existing infrastructure, deferring the costs of future infrastructure expansion, and resulting in considerable long-term savings for citizens. For example, the Region of Peel has developed a water efficiency plan to defer \$112 million in new water supply infrastructure through a 12-year water efficiency plan costing \$33 million.<sup>10</sup> Water efficiency is an economical source of new water.
- ∞ **Health Protection** – Contamination from lead pipes, in combination with other sources, can result in levels of lead in drinking water known to cause developmental deficits in children. Investment in infrastructure can offer health benefits in addition to reducing water loss. For example, the city of Toronto is replacing the old lead pipes in their distribution system which will simultaneously reduce leaks.
- ∞ **Innovative, Blue Technology** – A report from New York based Lux Research, *Water Cultivation: The Path to Profit in Meeting Water Needs*, states that revenues of the world’s water-related businesses will rise from \$522 billion in 2007 to nearly \$1 trillion by 2020 and predicts that water shortages will drive the need for innovations that emphasize efficiency, reuse and source diversification.<sup>11</sup> With the right encouragement, Ontario’s water technology sector is poised to seize this opportunity. A number of leading edge water and wastewater technology companies,<sup>12</sup> nationally renowned research organizations,<sup>13</sup> and several water modeling software companies<sup>14</sup> already call Ontario home. This existing network of expertise in innovative water solutions, particularly in water recycling and reuse technologies, presents a pivotal opportunity to expand Ontario’s technology sector.

## Reducing Energy Consumption

Every time we flush the toilet or turn on the tap, energy is washed down the drain. The cost of pumping, distribution, and treatment of water and wastewater is a significant expense for most Ontario municipalities.<sup>15</sup> Saving water saves energy by reducing pumping, treatment, and heating requirements, reducing carbon dioxide emissions and ultimately saving money.

- ∞ **CO2 Savings** - Toronto Water, the municipal operation responsible for water distribution in Toronto, uses more electricity than the Toronto Transit Commission and five times the energy consumed by all of the city's streetlights and traffic signals.<sup>16</sup> As part of Toronto's *2007 Climate Change, Clean Air and Sustainable Energy Action Plan*, the city explicitly acknowledges the need to increase water efficiency as a means of reducing the approximately 550 million kWh used every year to treat water and help attain its stated reduction in greenhouse gases by 2011.<sup>17</sup>
- ∞ **Cost Savings** - Energy costs for water pumping and treatment cost the Region of Peel an estimated \$25 million dollars in 2006. A study of Ontario municipalities by the Power Application Group Inc. noted that there has to date been a narrow focus on rapid payback energy efficiency programs such as compact fluorescent light-bulb (CFL) replacements.<sup>18</sup> The next generation of energy efficiency improvements will need to look beyond light-bulbs. Water efficiency and conservation is likely to become among the most cost effective energy reduction strategies for municipalities. In California, for example, the Energy Commission found that implementation of all identified water conservation measures could "achieve 95 percent of the savings expected from the 2006-2008 energy efficiency programs, at 58 percent of the cost".<sup>19</sup>

## Protecting the Environment

- ∞ **Adaptation** - Climate change will impact the hydrologic cycle, making our ecosystems, communities, businesses, and farmers vulnerable. Implementing water efficiency measures now can help make ecosystems and communities more resilient to long-term risks and reduce the vulnerability of all sectors to the impacts of a changing climate.<sup>20</sup>
- ∞ **Mitigation** - As described above, water efficiency and conservation presents a significant opportunity for reducing energy use, helping municipalities and the Province mitigate greenhouse gas emissions and contribute to the global effort to slow the progression of climate change.
- ∞ **Ecosystem Health** - Keeping sufficient water in watersheds, wetlands, and aquifers is critical to ensuring ecosystem function and health. Functioning watersheds provide valuable ecosystem services such as purification, flood protection, and habitat. Every litre of water saved represents additional water available to maintain these critical ecosystems and the services they provide.

## The Opportunity

The Ontario government's mandate to develop a water conservation and efficiency strategy represents an enormous opportunity to propel Ontario into the 21<sup>st</sup> century of water management.

**The Political Commitment** - the mandate for the strategy arises from a commitment made by the Premier of Ontario, the Honourable Dalton McGuinty, under the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement, a regional agreement that was signed with Quebec and the eight Great Lakes states. This agreement requires each state and province in the basin to establish water conservation goals, objectives, and programs and has established a number of regional objectives for conservation (see Box I).

**An Existing Framework** - In fulfilling this political commitment, Ontario has a number of existing instruments and policies to build on:

### Box I: Regional Water Conservation and Efficiency Objectives

- Guide programs toward long-term sustainable water use
- Improve monitoring and standardize data reporting among state and provincial water conservation and efficiency programs
- Adopt and implement supply and demand management to promote efficient use and conservation of water resources
- Develop science, technology and research
- Develop education programs and information sharing for all water users

- ∞ *The Green Energy Act* – makes the link between energy and water and enables minimum standards to be set for water efficient appliances such as toilets and clothes washers.
- ∞ *Permit to Take Water Program* – under this program, the province is now collecting water use information from applicants, and use of conservation best practices are now a consideration for new permits.
- ∞ *Clean Water Act* – in the near future, water budgets will identify water-stressed watersheds as part of the provincial source protection framework.
- ∞ *Financial Plans Regulation* – encourages full cost recovery and pricing of water and wastewater in Ontario municipalities.
- ∞ *The Building Code Act* – through regulation, this Act establishes Ontario's Building Code (last updated 2006), which requires water efficient plumbing fixtures in buildings constructed after January 1, 1996.
- ∞ *Safeguarding and Sustaining Ontario's Water Act* – amends the Ontario Water Resources Act to enable volume-based fees for highly consumptive commercial and industrial water users.
- ∞ *Ontario Low Water Response* – all permit holders in a watershed could be required to document their water efficiency and conservation practices should a low water level be declared.<sup>21</sup>
- ∞ *Environmental Farm Plans* – offer an existing mechanism to encourage the adoption of water conservation and efficiency best practices for agriculture.

## Leaders in the Field

In addition to building on existing instruments and policies, the province can also capitalize on the leadership already being shown by different actors and sectors. For example:

- ∞ Municipal members of the Great Lakes and St. Lawrence Cities Initiatives have resolved to reduce their water use by 15% by 2015.
- ∞ Members of the CWWA and OWWA water efficiency committees are actively involved in water conservation and many have plans to reduce water use by at least 10% within a 10 year period.<sup>22</sup>
- ∞ The City of Guelph is undertaking the first grey-water reuse pilot program in Ontario. Through the 2009 pilot program 30 residential grey-water reuse systems will be installed in both new and existing homes. The City's 2009 Water Conservation and Efficiency Strategy aims to install 200 grey-water reuse systems and 200 rainwater harvesting cisterns in residential homes by 2019.<sup>23</sup>
- ∞ Conservation Authorities often have water stewardship and monitoring programs in place, and are now engaged in drinking water source protection including the development of water budgets.
- ∞ Agricultural sector representatives, including OMAFRA<sup>1</sup> and OFA<sup>2</sup>, are supportive of water efficient best management practices such as water efficient irrigation and livestock watering practices.<sup>24</sup>
- ∞ Ontario is home to several municipal water efficiency networking organizations including the Canadian Water and Wastewater Association, the Ontario Water Works Association, and the Canadian constituent of the bi-national organization, the Alliance for Water Efficiency.
- ∞ A growing number of water efficiency consultants and technology firms are also setting up shop in Ontario. Examples include businesses that advise on municipal water conservation programming, internationally recognized experts on water efficiency standards for fixtures, and technology firms offering innovative rainwater harvesting, grey-water recycling, and wastewater reuse technologies.

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<sup>1</sup> Ontario Ministry of Agriculture, Food and Rural Affairs

<sup>2</sup> Ontario Federation of Agriculture

## A Proposed Vision for A New Water Future

Guiding this Blueprint for a Comprehensive Water Conservation and Efficiency Strategy is the vision of a sustainable water future in Ontario. Our proposed vision is a commitment to:

### “No New Water Supplies”

What does that mean? It means we stop the search for new supplies until maximum practical conservation and efficiency is achieved. We commit to finding the water we need through the abundant supply of “new water” that is being flushed down the drain. If we can find the funds to expand supply,

we can certainly find the funds to conserve. No New Water requires a shift to a comprehensive and strategic approach to water conservation and efficiency – a ‘soft path’ for water (refer to Box II). It enables us to live within the ecological limits of locally available supplies and it precludes new pipelines or diversions to distant lakes where the ecological consequences cannot possibly be anticipated.

#### Box II: Soft Path Core Principles

Four principles distinguish the soft path from conventional planning and management:

- Treat water as a service rather than an end in itself.
- Make ecological sustainability a fundamental criterion.
- Match the quality of water delivered to that needed by the end-use
- Plan from the future back to the present.

*Brandes & Brooks (2007)*

A commitment to “No New Water” enables our energy use for water supply and treatment processes to remain constant, or decrease, balancing the imminent burden of rising energy costs for Ontario citizens and municipalities. It contributes to the fight against climate change, instead of exacerbating it, and it fosters resilient, adaptable communities. It ensures our watersheds provide safe drinking water, support livelihoods, and it means Ontario’s watersheds of the future will be the ideal habitat for diverse ecosystems and a natural playground for our children and grandchildren.

Moving to a vision of “No New Water” will unleash the potential of Ontario’s technological and social innovators and it will lead us to sustainable water use, in which a culture of water conservation is embedded in all that we do. This is Ontario’s water future.



## PART II - THE BLUEPRINT

The Blueprint Summary Table introduces ten priority areas that should be incorporated into an effective provincial strategy. These priority areas are complemented by a number of specific actions to be **initiated over the next three years**. Key actors responsible for initiating each action are also suggested. All actions do not necessarily apply to all sectors; details surrounding each priority area and actions follow this Summary Table.

Transitioning to a goal of “No New Water Supplies” in Ontario will require action within three key elements of a comprehensive strategy, which guides the organization of this blueprint.

1. The Provincial government, working closely with Municipalities, provides the **leadership, direction and accountability** to re-orient Ontario toward the vision of No New Water;
2. Water use decision-making is informed by a **strong foundation of science and data**; and
3. The government cultivates a new water ethic and stimulates a market transformation, **creating a culture of conservation** in Ontario.

## Blueprint Summary Table

	Priority Areas	Action	Who
Provide Leadership, Direction and Accountability	<b>1. Oversight</b>	1. Appoint a Chief Water Conservation Officer (CWCO)	MOE <sup>3</sup>
	<b>2. Targets and Plans</b>	2. Implement a Provincial Target of No New Water Supplies	CWCO <sup>4</sup>
		3. Identify Stressed Watersheds & Initiate Development of Watershed-Based Targets	CWCO
		4. Establish Sector (Municipal, Industry, etc.) Targets, Performance Measures, and Plans	CWCO
		5. Implement 'Target 150' as a Goal for Individuals	WCTs <sup>5</sup>
		6. Require Permit Holders to Prepare Plans	MOE
	<b>3. Measuring Progress</b>	7. Annual Reporting	CWCO
Establish A Strong Foundation of Science and Data	<b>4. Water Budgets &amp; Data</b>	8. Establish a Database of Water Use	MOE/MNR <sup>6</sup>
		9. Initiate Studies on Ecological Water Needs	MOE/MNR
	<b>5. Benchmarks</b>	10. Identify Sectoral Benchmarks for Water Conservation & Efficiency	WCTs
	<b>6. Best Management Practices</b>	11. Identify Sectoral Best Management Practices for Water Conservation & Efficiency	WCTs

<sup>3</sup> Ministry of the Environment

<sup>4</sup> Chief Water Conservation Officer

<sup>5</sup> Water Conservation Teams (WCTs) include the CWCO, sector representatives (specifically municipal water efficiency stakeholder groups), government including a water conservation representative from each ministry, independent water efficiency experts, First Nations, CA's and/or Source Protection Committee members, public watershed protection groups, and other stakeholders

<sup>6</sup> Ministry of Natural Resources

<b>Create a Culture of Conservation</b>	<b>7. Financial Incentives</b>	12. Modify and Expand Existing Rebate and Incentive Programs	MOE/MNR/ MEI <sup>7</sup> / MRI <sup>8</sup> / MMAH <sup>9</sup>
		13. Require Conservation for Infrastructure Funding	MOE/MEI
		14. Invest in a Green Infrastructure Fund	MEI
		15. Support Environmental Farm Plans	MOE/ OMAFRA
	<b>8. Social &amp; Technical Capacity</b>	16. Foster Water Efficiency Expertise	MOE
		17. Provide Access to Toolkits and Technical Resources	MOE
		18. Support Innovative Research & Development	MOE/MNR/ MEI/ MRI/MMAH
	<b>9. Market Transformation</b>	19. Mandate Meters	MOE/ MMAH
		20. Move Toward Full-Cost and Volume-Based Pricing	MOE
		21. Increase Water Charges for Water Users	MOE
		22. Establish WaterSense Labeling Program in Ontario	MOE/ Fed Gov't
		23. Require Minimum Water Efficiency Standards	MOE/MEI
	<b>10. Education</b>	24. Launch a Social Marketing Campaign	MOE
		25. Support a Comprehensive Children's Education Program	MOE/ MOEd <sup>10</sup>

<sup>7</sup> Ministry of Energy and Infrastructure

<sup>8</sup> Ministry of Research and Innovation

<sup>9</sup> Ministry of Municipal Affairs and Housing

<sup>10</sup> Ministry of Education

## Provide Leadership Direction & Accountability

Leadership, direction, and accountability are essential drivers for a successful strategy. Leading by example, establishing clear priorities, and defining roles and responsibilities of key actors are important when implementing a plan of action. The strategy itself must have criteria against which to measure progress, our leaders must be accountable for achieving that progress, and progress towards the stated targets must be conveyed to the public if it is to be successful.

### Priority 1: Oversight

The Conservation Bureau and the Chief Energy Efficiency Conservation Officer were established by the Province to advance an energy conservation culture in Ontario. Water efficiency would benefit from an equivalent role to advance a culture of water conservation. The appointment of a Chief Water Conservation Officer would ensure appropriate oversight with respect to the implementation of the water conservation and efficiency strategy and its progress against conservation targets.

#### Action 1: Appoint a Chief Water Conservation Officer

Appoint a Chief Water Conservation Officer with similar roles & responsibilities to the Chief Energy Efficiency Conservation Officer, including:

- Measuring, tracking and reporting on the performance of the strategy.
- Advising on relevant government policy for conservation and efficiency.
- Establishing and implementing provincial, sectoral, watershed, and citizen water conservation and efficiency targets and plans.
- Designating Priority Sectors (described in Action 4) required to implement targets and plans, including Ontario's largest water using sectors.

## Priority 2: Targets and Plans

### Provincial Target

An overarching water conservation target is necessary to send a clear signal to the province as a whole that conservation and efficiency are essential to our continued economic and ecological health. Naturally, there are challenges associated with setting overarching targets, especially in the absence of solid baseline information on existing water use and the potential for water savings in each sector. Yet in spite of these challenges, a target provides incentive for change and a benchmark with which to gauge progress. Adopting a vision of No New Water Supplies, until all practical water conservation and efficiency has been achieved, inspires a paradigm shift towards water conservation without using an absolute or percentage reduction target that may be difficult to quantify.

#### Action 2: Implement a Provincial Target of No New Water Supplies

Establish a water conservation target of No New Water Supplies for the entire province to communicate to all Ontarians that the government is willing to provide the "leadership" necessary to advance a culture of water conservation.

### Watershed-Based Targets

From an ecological perspective, the most appropriate scale for water conservation and efficiency targets is the watershed. Depending on the number, size, and type of withdrawals, as well as prevailing geophysical and climate conditions, certain watersheds will face more water stress than others. Tailoring conservation targets to the level of stress within Ontario's watersheds is the most effective way to respond to the needs of the ecosystems that depend on healthy rivers, lakes, and aquifers.

Ontario is well positioned to initiate development of watershed-based maximum water withdrawal limits. The creation of water budgets under the Clean Water Act provide the necessary basis for setting both maximum water withdrawal limits and targets for water conservation and efficiency at a watershed level. Targets should be ecologically relevant, and watersheds under known water quantity stress should be required to reduce water use immediately from current levels to avoid unknown and possibly cumulative consequences of long term failure to meet ecological needs.

A comprehensive watershed assessment of ecological needs for water would also be necessary to accurately assess a sustainable level of water withdrawals. A number of Conservation Authorities are already well-placed to assist the Province with identifying instream flow needs, provided they are given the resources and support to undertake these studies. The Province must provide sufficient resources for this effort, and make hydro-geologic studies and data available to stakeholders to avoid redundancy.

### Action 3: Identify Stressed Watersheds & Initiate Development of Watershed-Based Targets

Development of watershed-based maximum water withdrawals and water conservation targets should be required by the Chief Water Conservation Officer, including a process that involves:

- Identifying “stressed” watersheds, where:
  - A “stressed” watershed is defined as meeting at least one of the following conditions:
    - The watershed is designated as a high use watershed under the Permit to Take Water Program.
    - Source protection committees have identified water withdrawals as a risk to a drinking water source.
    - Where low water levels have occurred, for example as identified by the Low Water Response Plan.
    - Water budgets have identified that in-stream flow needs are at risk.
- Informing the development of targets by Source Protection Committees, stakeholder consultation and Conservation Authorities.
- Responsibility for watershed-based targets ultimately resting with the Chief Water Conservation Officer.

## Sector Targets, Performance Measures, and Plans

Sector level targets, including municipal targets, are appropriate for setting targets that are measurable, realistic and inspire water users towards progressive action. Performance measures, “a characteristic or metric that can be used to assess the performance aspects of a program or project,”<sup>25</sup> are essential to effectively measure and monitor progress against targets. For example, a performance measure could be a percentage of communities that are fully metered or a percentage of businesses that adopt a specific best management practice.

Priority Sectors should include Ontario’s largest water using sectors. In Alberta, for example, the seven largest water using sectors are: Chemical and petrochemical; Forestry; Irrigation; Mining; Municipalities; Oil and gas; and Power generation. In Ontario, water charges now apply to highly consumptive industrial or commercial sectors such as water bottling, beverage manufacturers, canning facilities, concrete manufacturers, and chemical producers.<sup>26</sup> These sectors, along with large non-industrial water takers, such as municipalities, large irrigation operations, and power generation facilities would be logical sectors to designate Priority Sectors.

Each sector has specific water use needs (quantity and quality), different best management practices, processes, designs, and technologies, as well as varied levels of progress to date and capacities to achieve further water conservation and efficiency goals. Targets and performance measures need to be tailored to each sector based on these specific needs. Plans guide sectors toward achieving targets and performance measures for improved water conservation and efficiency and should reflect best management practices with the sector.

## Action 4: Establish Sector Targets, Performance Measures and Plans

Water Conservation Teams (WCTs) develop sector-based water conservation and efficiency targets, performance measures, and plans for Priority Sectors (including municipalities) under the guidance of the Chief Water Conservation Officer. Specifically, the WCTs would:

- Develop targets, performance measures and plans.
- Post targets, performance measures and plans on the Environmental Bill of Rights Registry for public comment.

## Citizen Target

The purpose of an absolute per capita water use target is to encourage all citizens in Ontario to adopt a conservation ethic, regardless of a perceived abundance of water or low population growth rates. An absolute per capita target is much clearer than a percentage based target for which a reference point must be specified, and thereby encourages action despite an ill defined baseline. Citizens in Ontario are generally unaware of how much water they use. Providing a benchmark for efficient water use in the home that can be achieved today with off-the-shelf technologies is therefore a useful tool for educating citizens.

Getting to an urban residential water use of 150 litres per capita per day (LCD) in a generation is attainable providing appropriate actions are taken now. Queensland Australia recently reduced water use from 300 LCD to less than 140 LCD with their very effective Target 140 campaign.<sup>27</sup> According to preliminary estimates by Veritec Consulting, 150 LCD indoor residential use could be achieved passively by 2040 simply by mandating off-the-shelf high efficiency fixtures and appliances in all new homes today and for all point of sale transactions by 2015. By taking the actions outlined in this blueprint, including supporting municipalities in their conservation programming, this process could be expedited in order to reach the goal within a generation.

## Action 5: Implement 'Target 150' as a Goal for Individuals

Implement 'Target 150 within a generation' as a centerpiece of the government's water conservation and efficiency strategy. Government support is critical to achieving this target, including:

- Implementation of standards and labelling, rebates, incentives, implementing social marketing campaigns, and by advancing new technology.
- Commitment to banning 13 L toilets, and to mandating high efficiency (4.8 L) toilets by 2015, in accordance with the precedent set by California.<sup>28</sup>

## Permit-Holder Conservation Plans

Applicants for new or expanded permits to take water are currently required to document existing and planned water conservation and efficiency best management practices ('BMPs') under the Permit to Take Water system. Although this requirement provides a good basis for encouraging water efficiency, the applicant is simply required to consult their relevant sector association to identify best practices. Water conservation and efficiency plans, combined with increased clarity and criteria for best practices, would prevent future inefficiencies in all "new" water takings. Some flexibility is required to account for site specific conditions, for example drip irrigation is an agricultural best management practice that is not feasible for all crops.

### Action 6: Require Permit Holders to Prepare Plans

Water conservation and efficiency plans should be required by permit holders through a process that includes:

- Establishing a reasonable schedule for phasing in requirements for water conservation and efficiency plans to be prepared.
- Requiring plans when:
  - A new permit, or an expansion to an existing permit, is requested.
  - The permit holder is a member of a Priority Sector.
  - The permit holder is in a watershed identified as "stressed".
- Establishing sector specific templates for conservation plans to ensure permit applicants document existing and planned use of approved best management practices. The templates should be sufficiently simple to be completed by individuals without hiring a professional.
- Devising a flexible criteria system to guide approvals of new permits or requests for increased takings based on:
  - Adoption of documented best management practices where applicable.
  - Adherence to defined criteria in cases where well-known BMPs apply such as evidence of volume-based conservation pricing, outdoor water audits completed, and updating existing buildings to incorporate water efficient fixtures.
  - Require requests for new water withdrawals to be offset by reducing water use in other areas within the watershed.

### Priority 3: Measuring Progress

Measuring and tracking the progress of the strategy is essential for ensuring accountability and enabling the strategy to adapt to changing societal and ecological contexts and new opportunities. Requiring major water use sectors to report progress against their own water conservation and efficiency targets, performance measures, and plans would be an important component of the reporting process. To ensure transparency, reporting should be available for public review. The potential for inaccuracies associated with self-reporting water use reductions should be addressed through actions such as independent auditing.

#### Action 7: Annual Reporting

The Chief Water Conservation Officer produces a publicly available, annual report that summarizes progress made against targets and plans, including:

- The results of annual Water Conservation Team reports on progress against targets and plans.
- Addressing the nature of ongoing barriers to better water conservation and efficiency including a review of existing policies.
- Adapting plans, actions and policies to changing social, ecological and technical needs and opportunities.
- Validating the information provided by permit holders, for example by undertaking random independent water audits, to verify the reported progress in each sector.

## Establish a Strong Foundation of Science & Data

A solid foundation of science and data is necessary to establish effective baselines, assess the potential for conservation and efficiency, and develop robust and realistic targets and plans. We need to know how much water is available, how much is being used, and what opportunities exist to reduce water use and loss. Until the data is available, water use decisions should take a precautionary approach to protecting long term ecosystem and human needs for water.

### Priority 4: Water Budgets & Baseline Data

#### Baseline Data

A water budget is a model of inflow, outflow, withdrawals and storage in a specific watershed. It reflects the relationship between inputs such as precipitation and groundwater inflow, and outputs such as evapotranspiration and water withdrawals, and it enables identification of stressed watersheds or areas of stress within a watershed. Understanding the relationship between ground and surface water in the Great Lakes basin is also important for ensuring the sustainability of water resources in Ontario. Delineating aquifers, determining current rates of recharge, and the land area and soil type necessary to ensure sustainable replenishment of groundwater sources are part of the baseline data that should be collected.

Water conservation and efficiency is a means to lessen the impacts of water use on a watershed. However, in order to understand if water conservation measures are having an impact on water use, it is necessary to first have baseline information on water use.

#### Action 8: Establish Database of Water Use

Begin consolidating information on the actual water use of various sectors and water users to create an accurate portrait of water withdrawals within the province. To ensure the database is effective:

- Require data collection protocols and formats, through the Permit to Take Water (PTTW) program and the Clean Water Act (CWA), be conducive to establishing current water use benchmarks and to measuring progress against performance measures.
- Ensure information is publicly available and presented in a way that is easily understood by the average citizen.

## Ecological Needs for Water

It is critical that water budgets account for ecological water needs, not just human needs such as drinking water supplies. Adequate flows in rivers and lakes<sup>xi</sup> are essential for healthy functioning ecosystems, and the ecological services that these ecosystems provide. Assessing ecosystem needs for water is necessarily complex; a precautionary approach should be adopted in the absence of certainty.

### Action 9: Initiate Studies on Ecological Water Needs

Support development of watershed-based targets by working with Conservation Authorities to undertake comprehensive studies of the ecological needs for water in their watersheds, by:

- First completing studies on the ecological needs for water in “stressed” watersheds and ground water aquifers.
- Phasing in studies on the remaining watersheds and ground water aquifers.

## Priority 5: Benchmarks

Benchmarks, a “standard by which something can be measured or judged”, are useful for comparing current water use to best practices within sectors. For example, benchmarks for residential indoor water use in Ontario have been stated as approximately 250 LCD prior to the 1996 Building Code change, 200 LCD for new homes meeting the current code, 150 LCD assuming all fixtures are “high efficiency”, and as little as 120 LCD if “best in class” water efficiency measures are implemented.<sup>29</sup> Similar numerical benchmarks for industrial, commercial and institutional water use are currently less defined or non-existent, largely because water is used in each of these sectors for widely varying purposes.

Specific benchmarks for water use within a number of Priority Sectors could likely be developed, such as the benchmarks identified for several types of food processing by RMIT University in Australia in its Water Saver Toolkit.<sup>30</sup>

### Action 10: Identify Sectoral Benchmarks for Water Conservation & Efficiency

Water Conservation Teams will identify sector specific water use benchmarks for Priority Sectors, including examining international examples of sector-specific benchmarks where applicable.

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<sup>xi</sup> Rivers and lakes should not be construed to include man-made ditches that have not previously existed as natural watercourses.

## Priority 6: Best Management Practices

Each sector is anticipated to have a suite of BMPs, some of which can be, or are already, formalized such as irrigation BMPs published by the Ontario Ministry of Agriculture, Food, and Rural Affairs or BMPs for residential water efficiency produced by the Ontario Water Works Association.

### Action 11: Identify Sectoral Best Management Practices for Water Conservation & Efficiency

Water Conservation Teams will identify BMPs for Priority Sectors and conduct a barriers analysis to identify barriers to adoption of BMPs that may include resource constraints, knowledge barriers and reluctance to move from traditional practices.

## Create a Culture of Conservation

A strong foundation of science and data will tell us where we are today. Establishing conservation targets and plans will set the goals for where we want to be tomorrow. The following priorities and actions are designed to answer the question, *how do we get from today to where we want to be tomorrow?* Actions outlined here emphasize the Province's leadership role to catalyze action by communities, businesses, and individual citizens to embrace a culture of water conservation.

### Priority 7: Financial Incentives

In order to create a culture of conservation, governments will likely have to provide incentives to transition towards sustainable water use for a period of time.

#### Rebates and Incentives

A number of retrofit rebate and incentive programs already exist in Ontario. Expanding these existing rebate and incentive programs to include water efficiency is a practical and cost effective way to increase purchases and retrofits of water efficient fixtures and equipment. The incremental costs of expanding existing programs to include water conservation and efficiency are small in comparison to the co-benefits of reduced energy costs for municipalities, the boost to innovative water technology industries, and the preservation of ecosystems.

#### Action 12: Modify and Expand Existing Rebate and Incentive Programs

Ensure that funding and rebate programs administered by the Ministry of Energy and Infrastructure and the Ontario Power Authority recognize the water-energy nexus and include water efficiency provisions, such as:

- Making water conservation measures eligible for funding and rebates in the Municipal Eco-Challenge fund; the Electricity Retrofit Incentive Program and the Industrial Energy Efficiency Program.
- Updating the existing 6L toilet rebate to High Efficiency (4.8 L) WaterSense approved toilets within the "Ontario Home Energy Savings" program. Also consider including efficient humidifiers and hot water recirculation systems.
- Matching rebates offered by the Canadian ecoEnergy Retrofit for Small and Medium Organizations for retrofits in businesses that save both water and energy. Include rebates for water efficient pre-rinse spray valves for restaurants and food retailers.

## Criteria for Funding

It is important that provincial funding for water-related infrastructure and projects be used wisely. An effective way to ensure that taxpayer dollars are used to support sustainable water infrastructure and innovative practices is to make water efficiency and conservation a condition for provincial and federal support. This approach is already a part of BC's infrastructure granting program and is formally recognized in their provincial water strategy.<sup>31</sup>

### Action 13: Require Conservation for Infrastructure Funding

Identify water-related government funding and programs for Priority Sectors and require water conservation and efficiency as conditions for funding. For example:

- Require evidence of water conservation practices for requests for water supply funding in the Canada-Ontario Infrastructure Program (COIP). For example, comparison of a community's water use against performance measures, such as benchmarks for residential per capita consumption, or adoption of BMPs such as conservation-based pricing could be required.
- Support Priority Sectors in achieving new criteria for funding by providing funds to secure "new water" through conservation programming.
- Ensure no Federal funding is given to Ontario projects that have not received approvals and permits

## Green Infrastructure

Investments in green infrastructure would generate new employment opportunities, stimulate the economy in the short-term, ensure long-term benefits for the environment, and promote a shift to a more innovative economy. Smart spending on sustainable forms of water infrastructure, such as water conservation and efficiency, should be prioritized over pouring money into out-dated approaches that rely on building expensive, and energy-intensive pipelines, pumps, and plants that create new debt for future generations, encourage urban sprawl, and increase Canada's carbon emissions. Furthermore, pilot programs of innovative green infrastructure are needed to determine the potential for broad use in water conservation and efficiency planning.

### Action 14: Invest in a Green Infrastructure Fund

Support an Ontario Green Infrastructure Fund (GIF) by investing funds collected from Water Charges or Permit fees or utilizing existing dollars such as the Canada-Ontario Infrastructure Program (COIP) and Industry Canada's Ontario Potable Water Program. The GIF should:

- Fast-track infrastructure funding for the development of sustainable water infrastructure.
- Include funding for water infrastructure repairs and leak detection, comprehensive water conservation and efficiency programs, stormwater management best practices, and pilot programs that advance innovative water practices such as rainwater harvesting, use of non-potable water sources, or soft path planning processes.<sup>32</sup>

## Water Efficient Agriculture

Environmental Farm Plans (EFPs) are voluntary assessments prepared by farm families to identify areas for environmental improvement.<sup>33</sup> EFPs are an established and effective instrument for supporting agricultural Best Management Practices – defined as “a practical, affordable approach to conserving a farm’s soil and water resources without sacrificing productivity”.<sup>34</sup>

### Action 15: Support Environmental Farm Plans

Invest in the Environmental Cost-Sharing programs of the Environmental Farm Plan for implementation of Best Management Practices for agricultural water efficiency by increasing the funding caps and percentage of cost-share from 30% to more than 50% for water conserving practices.

## Priority 8: Social & Technical Capacity

### Social Capacity

Competent water efficiency practitioners are essential for transforming the economy from a hard infrastructure supply-side paradigm to an innovative economy demand-side paradigm. Knowledgeable, creative practitioners that work to optimize water use efficiency will benefit Ontario’s economy now and into the future. The Province should provide communities access to water efficiency knowledge in the form of in-house government expertise, experts within non-profit organizations and networking groups, training opportunities, and in some cases financial resources to hire practitioners.

### Action 16: Foster Water Efficiency Expertise

Foster water efficiency expertise in all sectors by:

- Developing government expertise in water conservation, efficiency and ecological needs for water to provide advice and support to permit applicants, Source Protection Committees, OMAFRA, Irrigation Advisory Committees and Water Use Co-operatives.
- Providing funding through cost-shared programs and partnerships for businesses, municipalities, farmers, and industry associations to hire water conservation experts to assist with programming, develop expertise and transfer knowledge to permit holders.
- Providing training and financial support to a central organization to deliver water conservation and efficiency auditing, rebate programs, and community based social marketing services for residential and ICI sectors as has been done by Green Communities Canada<sup>35</sup> for energy efficiency and Well Aware programs and by the California Urban Water Conservation Council.<sup>36</sup>
- Providing financial support to effective, capacity building networks knowledgeable in water efficient practices such as the CWWA and OWWA Water Efficiency Committees, the Alliance for Water Efficiency, and the Ontario Federation of Agriculture.

## Technical Capacity

A recent CWWA Benchmarking initiative found that many municipalities across Canada do not fully understand how water is used within their communities. Without this understanding targets are meaningless. Technical resources such as toolkits, guidelines, templates, best practices, and model bylaws that are easily standardized will ease the transition to water efficient communities.

### Action 17: Provide Access to Toolkits and Technical Resources

Enable access to water conservation and efficiency auditing toolkits, detailed guidelines, templates for planning, model bylaws, best management practices, and other resources for all Priority Sectors. Work with existing clearinghouse(s) (e.g., the Alliance for Water Efficiency and OMAFRA) to provide a central location, familiar to each sector, for all resources and tools.

## Research & Development

Ontario's technology, service and academic sectors require support and encouragement to develop 21<sup>st</sup> century solutions to the mounting challenges of global water scarcity. Innovative water conserving technologies, practices, tools and techniques that enable sustainable water use will be in high demand internationally. Investing in this research today will enable water businesses, professionals and academics, living and working in Ontario, to meet the demand for innovative services tomorrow.

### Action 18: Support Innovative Research and Development

Re-allocate a portion of existing water research funding from end-of pipe solutions to support innovative solutions, including:

- Pilot programs to test new technologies, planning processes, and other innovative solutions such as social marketing programs and novel conservation programming.
- Water conservation and efficiency technologies, practices, and tools.
- Alternative, non-potable sources of water such as rainwater, grey-water, reuse and recycling.

## Priority 9: Market Transformation

Conservation should be an easy, automatic part of our daily interaction with water. Efficient technology can help us achieve that. A market transformation could encourage businesses to develop and deliver innovative, cost effective, water saving solutions. An awareness of the water-footprint of products could better enable citizens to do their part to use water wisely in their homes and workplace.

This transformation will eventually allow provincial and local governments to phase out rebates and financial incentives for water efficiency, because the right signals for citizens, businesses and

communities will be embedded in our economy. But until this transformation penetrates our value systems and infuses the market, our leaders must initiate and guide this transition.

## Meters

Metering water use is one of the most important BMPs for encouraging water conservation, and is essential for the adoption of any volume-based pricing structure.<sup>37</sup> The City of Calgary has observed through local studies “that metered customers use 60 per cent less water on average than customers on a flat rate because they are more conscious of where and how water is used”.<sup>38</sup> Nationally, a similar trend has been noted. Without metering, it is impossible to understand how much water is being used and where the opportunities for savings lie.<sup>xii</sup>

### Action 19: Mandate Meters

Meters should be required in all new construction of homes, businesses and industry, through:

- Mandating universal metering for all urban communities.
- Requiring sub-metering for multi-residential buildings.
- Encouraging metering in small communities, with financial and technical support provided as needed.

## Full-Cost and Volume-Based Pricing

Ontario’s Financial Plans Regulation encourages municipalities to introduce full-cost pricing. Financial plans are required by December 2010 at the latest, depending on the municipality, and will outline the full-costs associated with providing water. There are a large number of municipalities (low-income, small, northern, and First Nations) who may be unable to fully recover the costs of municipal water infrastructure and operation for a number of reasons. Special consideration would need to be given to these municipalities. The intent of pricing water according to its full cost is to move away from a culture of “cheap water” in areas where residents can currently “afford” to waste water.

The full cost analysis should extend to protecting the source, replacing aging infrastructure at a reasonable rate, water conservation planning and programming, education, research, and treatment of wastewater as opposed to a narrow focus on water treatment infrastructure. Full-cost, volume-based water pricing remains a key recommendation from the Environmental Commissioner of Ontario. The Province should aim to continue to move towards this goal, whilst avoiding undue hardship on low-income communities. In particular, equitable access should be addressed by providing the first block of water at low or no cost to all consumers to ensure basic human water needs are met.

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<sup>xii</sup> The PTTW allowance for reporting pump records for small self-supplied license holders, such as small agricultural operations, is a reasonable approach to avoid a cost burden on rural families.

## Action 20: Move Toward Full-Cost and Volume-Based Pricing

Conduct a review of financial plans submitted in accordance with the Financial Plans Regulation to identify gaps in responsible, sustainable planning for water provision. If a review of the financial plans suggests that full cost and volume based pricing are not planned in the majority of urban communities, develop a plan of action to ensure implementation of full cost and volume based pricing in these communities.

In August 2007, the province introduced a water charge for highly consumptive industrial and commercial water users. Starting on January 1, 2009, all “phase one industrial or commercial water users” are required to pay \$3.71 for every million litres of water that they take each year. The stated purpose of this charge was to recover the costs of the province’s water management programs and to encourage conservation. However, the Environmental Commissioner of Ontario has stated that: “[T]his low fee will help cover only a small portion of the costs of the province’s needed water management programs, and furthermore, will do nothing to encourage conservation or efficient use of Ontario’s waters.”<sup>39</sup> The Commissioner has strongly urged the Ontario government to take a more expansive approach in the future. These charges should apply only to non-essential industrial and commercial water takings, not to the minimum water necessary for ecosystems, food, and human health.

## Action 21: Increase Water Charges for Water Users

Water charges should be increased to reflect the full value of the water withdrawn, including ecological values and the quantity and quality of the water being returned to the ecosystem. Actions include:

- Increasing water charges for highly consumptive users.
- Broadening the category of users subject to the water charge to include mining, pulp and paper, and thermal power generation.<sup>40</sup>

## Efficient Products and Buildings

Municipalities are spending millions of dollars per year on rebate programs that would no longer be necessary if water wasting fixtures (13L toilets, top-loading clothes washers, inefficient pre-rinse spray valves) were no longer available for purchase. The US Energy Policy Act sets minimum water efficiency standards for both new construction and all point of sale transactions.<sup>41</sup> The Green Energy Act, recently passed into law, has the potential to similarly mandate minimum water efficiency standards for point of sale transactions – potentially banning the sale of 13 L toilets.

The Building Code changes in 1996 were instrumental in improving Ontario’s water efficiency. Mandating best available efficient fixtures, and updating specifications regularly, makes purchasing the most efficient technology easy and automatic for consumers and incentivizes development of new technology. Installing best available technology in all new construction is much more cost effective than conducting retrofits later, and ensures all new demands for water are the most efficient possible. Another key action is to make water conservation a simple choice for Ontario consumers by adopting WaterSense, the water efficiency equivalent of the successful ENERGY STAR consumer labeling program.

## Action 22: Establish WaterSense Labelling Program in Ontario

Partner with the US EPA's WaterSense program, for example by:

- Encouraging Ontario organizations to become WaterSense partners including municipalities, builders, retailers, and irrigation professionals.
- Advocating federally for a national organization to administer a Canadian WaterSense program, equivalent to its US EPA counterpart, in the same way Canada administers the EnergyStar program through Natural Resources Canada's Office of Energy Efficiency.

## Action 23: Require Minimum Water Efficiency Standards

Require minimum water efficiency standards that meet or exceed existing international standards, including:

- Mandating best available technology and practices for new homes in the Ontario Building Code (OBC), such as:
  - Mandate WaterSense approved fixtures and water efficient landscapes.
  - Mandate plumbing rough-in's that enable future water collection and use of alternative sources for toilet flushing and lawn watering (purple pipes) as will be mandated in British Columbia by 2010.
  - Investigate the feasibility of hot water recirculation in new home construction.
  - Increase the OBC review cycle to every 3 years to ensure standards reflect the most up to date water efficient standards.
- Extending standards beyond new construction to manufacturers and point of sale transactions, such as:
  - Ban 13 L toilets.
  - Mandate standards for all other high efficiency fixtures, that meet or exceed US standards.
  - Mandate High Efficiency residential toilets (4.8 L) by 2015 as in California.
- Educating plumbing inspectors and provide improved technical resources for innovative technologies such as rainwater harvesting and grey-water reuse (i.e. provide a series of technical templates and background to base approval decisions on).

## Priority 10: Education

The myth of abundance has shaped our excessively high water use in Ontario. To affect a change in behaviour in all sectors of society and to generate lasting support for water efficiency initiatives a new water ethic must be instilled.

Social marketing is an approach to developing a communication strategy to achieve specific behavioral goals for a social good. Doug McKenzie-Mohr, a strong advocate for social marketing, has noted that “crisis behavior is myopic. We need to look more broadly at where we should be going as a society.”<sup>42</sup> A well planned and comprehensive social marketing campaign is required to instill a long term culture of water conservation in all citizens and sectors that extends beyond reactionary behaviour.

### Action 24: Launch a Social Marketing Campaign

As part of ‘Target 150’, develop and launch a marketing campaign that directly appeals to the different values that influence citizens’ water use and pilot the campaign before expanding to the rest of the province. For example:

- Conduct a barriers analysis to identify values-based decisions around water use and the barriers to uptake.
- Identify the most effective scales for different messaging based on the barriers analysis and support communities in developing tailored campaigns as required.
- Require water utilities to report per capita consumption, average monthly per capita consumption including an estimated breakdown of indoor and outdoor water use and ‘Target 150’ on water utility bills, such as in the Target 140 Campaign in Queensland Australia.<sup>43</sup>

In 20 short years, the children of today will be the leaders and citizens of tomorrow. Education is the key to fostering long term water stewardship and creating a culture of conservation.

### Action 25: Support a Comprehensive Children’s Education Program

Incorporate water conservation into the provincial primary and secondary curriculum, including:

- Principles of sustainable water use, ecosystem needs for water, water conservation, and the importance of managing human activities to maintain the long term health of water ecosystems.
- Requiring all students to complete at least one stream-health assessment, for example as required within BC’s Living Water Smart Strategy.

## H<sub>2</sub>O ONTARIO – BECOMING A LEADER IN WATER CONSERVATION

This Blueprint outlines a comprehensive and integrated approach to guide the development of the provincial government's water conservation and efficiency strategy. It is built on the broad vision of 'No New Water Supplies', meaning that the search for new water supplies ends and the collective efforts to unleash the full potential of water conservation begins.

The 10 priority areas and 25 actions form a pragmatic and innovative framework that would make Ontario a leader in the Great Lakes-St. Lawrence River Basin, and place it on the road to becoming a world leader in water conservation and efficiency. This plan establishes meaningful targets to spur meaningful change and is designed to foster the creativity inherent within our communities and businesses in order to meet these targets.

Critically, the actions within this plan recognize the fragility of our ecosystems, the need to reduce our energy costs, and the substantial economic opportunity associated with innovations in water technology. We urge the Ministry of the Environment, and the province as a whole, to act on this plan and to instill a culture of water conservation within Ontario.

The Blueprint signatory groups collectively commit to engaging in an ongoing dialogue with other groups, organizations, and government to promote action towards a comprehensive water conservation and efficiency strategy.

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