Great Lakes/St. Lawrence River Water Conservation Model Policies & Measures

State/Provincial Model
Public Water Utility Model

Alliance for the Great Lakes

Ensuring a Living Resource for all Generations

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Public Water Utility Model

The Alliance thanks the following foundations for their generous support during the creation and implementation of the Great Lakes Compact and Agreement:

The Joyce Foundation
Charles Stewart Mott Foundation

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I. Acknowledgements

This document grew out of a confluence of several circumstances and ideas. Those who were associated with the development and approval of the Great Lakes St. Lawrence River Basin Water Resources Agreement and Compact are aware that, in approving the Agreement and Compact, the states accepted an obligation to develop and approve by December 2010 water conservation goals and objectives consistent with the Compact, and to develop, implement and promote water conservation programs. The provinces accepted a similar obligation under the Agreement with a less definitive timeline.

At the September 2009 Healing Our Waters Conference in Duluth, Minnesota, John Jackson, Program Director at Great Lakes United, suggested that the environmental groups (referred to as the Compact Coalition) active in the development of the agreements and their implementation should develop water conservation models to: assist the states and provinces in meeting their obligations; to define the environmental groups' expectations for state and provincial officials; and for use in assessing state and provincial programs and the water conservation proposals of applicants for new and increased withdrawals and consumptive uses.

Since a work plan task assigned to Ed Glatfelter, Director of Water Conservation programs at the Alliance for the Great Lakes, was the development of such a model, he volunteered to initiate a draft. Numerous drafts were distributed to the Compact Coalition for review and comment. At a May 2010 Compact Coalition meeting in Ann Arbor, Michigan, a fairly complete water conservation draft was reviewed and commented upon in a workshop. Thank you to all of those who reviewed and commented on versions of this document and who participated in the workshop in Ann Arbor.

This is not an original work, but is largely a compilation and editing of ideas found in the seven source documents identified in the Introduction. A special thank you to all of those involved in the development and publication of those works.

II. Endorsements

This report is endorsed by the following organizations, a community of environmentalists seeking to protect and sustain the Great Lakes and St. Lawrence River, in part through implementation and enforcement of the Great Lakes/St. Lawrence River Basin Water Resources Compact and Agreement. The report aims to: influence Great Lakes/St. Lawrence state, provincial and utility water conservation policies; assist in evaluating Great Lakes/St. Lawrence state and provincial programs; and assist in evaluating water conservation programs of applicants for new or increased withdrawals, diversions and consumptive uses under the compact and agreement.

Alliance for the Great Lakes
www.greatlakes.org

Tip of the Mitt Watershed Council
www.watershedcouncil.org

Canadian Environmental Law Association
www.cela.ca

River Alliance of Wisconsin
www.wisconsinrivers.org

Ohio Environmental Council
www.theoec.org

Great Lakes Environmental Law Center
www.glelc.org

Minnesota Conservation Federation
www.mncf.org

Save Lake Superior Association
www.savelakesuperior.org

Citizens Campaign for the Environment
www.citizenscampaign.org

Flow for Water Coalition
www.flowforwater.org

Milwaukee Riverkeeper
www.milwaukeeriverkeeper.org

National Wildlife Federation
www.nwf.org/greatlakes

Clean Water Action
www.cleanwateraction.org

Prairie Rivers Network
www.prairierivers.org

Great Lakes United
www.glu.org

Wisconsin Wildlife Federation
www.wiwf.org

National Resources Defense Council
www.nrdc.org

Nature Quebec
www.naturequebec.org

Midwest Environmental Advocates
www.midwestadvocates.org

Conserve-Great Lakes
www.conserve-greatlakes.com

Save the Dunes
www.savedunes.org

Clean Wisconsin
www.cleanwisconsin.org

Michigan Environmental Council
www.environmentalcouncil.org

Fresh Water Future
www.freshwaterfuture.org

III. Introduction

These models, endorsed by environmental groups across the Great Lakes and St. Lawrence River basin, were developed to: influence state, provincial and utility water conservation policies and measures: be used in the periodic evaluation of state and provincial programs for effectiveness and improvement, and be used to evaluate water conservation programs of applicants under the Great Lakes St. Lawrence River Basin Water Resources Compact and Agreement provisions.

While these models are intended to be consistent with the five Compact and Agreement water conservation and efficiency goals* and with the five objectives adopted by the Regional Body** and Compact Council**, they do not include suggested language for state or province goals and objectives.

1. Background

The Great Lakes St. Lawrence River Basin Water Resources Compact and Agreement have two primary purposes: to prevent the diversion of Great Lakes/St. Lawrence waters outside of the basin and to efficiently manage the withdrawal and use of water within the basin. The Compact and Agreement, recognizing that efficient and responsible water use is a cornerstone of sound water management policy, require water conservation as a critical element of state and provincial water management programs.

Section 4.2.1 of the Compact and Article 304.1 of the Agreement establish the following five water conservation and efficiency goals:

- Ensure improvement of the Waters and Water Dependent Natural Resources
- Protect and restore the hydrologic and ecosystem integrity of the Basin;
- Retain the quantity of surface water and groundwater in the Basin;
- Ensure sustainable use of Waters of the Basin; and,
- Promote the efficiency of use and reducing losses and waste of Water.

In accordance with Article 304 of the Agreement and Section 4.2 of the Compact, the Regional Body adopted regional water conservation and efficiency objectives on December 4, 2007 as Resolution #6 and the Compact Council adopted the same objectives on December 8, 2008 as Resolution #5. These objectives are broad, overarching concepts which provide the basis for required State and Provincial water conservation goals, objectives and programs that will be more specific in nature. The Compact and Agreement require state and provincial water conservation and efficiency goals, objectives and programs that are consistent with the Compact and Agreement goals and the Regional Body and Compact Council objectives (See appendix A for the regional objectives).

*Compact Section 4.2.1, Agreement Article 304.1
**Body: Resolution #6, 12/4/07 & Council: Resolution #5, 12/8/08

The Compact and Agreement also establish a minimum decision making standard to be met by all applicants subject to regulation for new or increased withdrawals or consumptive uses, and an exception standard to be met by all applicants requesting an exception to the prohibition on diversions. Each standard includes water conservation and efficiency requirements as follows:

Decision-Making Standard*

3. The withdrawal or consumptive use will be implemented so as to incorporate environmentally sound and economically feasible water conservation measures;
5. The proposed use is reasonable, based upon a consideration of the following factors:
    a. Whether the proposed withdrawal or consumptive use is planned in a fashion that provides for efficient use of the water, and will avoid or minimize the waste of water;
    b. If the proposal is for an increased withdrawal or consumptive use, whether efficient use is made of existing water supplies;

Exception Standard**

a. The need for all or part of the proposed exception cannot be reasonably avoided through the efficient use and conservation of existing water supplies;
b. The exception will be limited to quantities that are considered reasonable for the purposes for which it is proposed;
e. The exception will be implemented to incorporate environmentally sound and economically feasible water conservation measures to minimize water withdrawals or consumptive use.

2. Sources

This document is based on materials in the below referenced works; on ideas of the editor, Ed Glatfelter, Director of Water Conservation, Alliance for the Great Lakes; on the Great Lakes St. Lawrence River Basin Water Resources Compact and Agreement; on Regional Body Resolution #6 and Compact Council Resolution #5, and on changes prompted by feedback from reviewers.

Source Documents

Stewardship Leadership Accountability: Safeguarding and Sustaining Ontario's Water Resources for Future Generations, Summer 2009, Minister of the Environment, Minister of Natural Resources.

H2Ontario: A Comprehensive Water Conservation and Efficiency Strategy, The POLIS Project on Ecological Governance, University of Victoria, 2009

Thinking Beyond Pipes and Pumps: Top 10 Ways Communities Can Save Water and Money, By Oliver M Brandes, Tony Maas and Ellen Reynolds, The POLIS Project on Ecological Governance, University of Victoria, October 2006, as found at *www.a4we.org, Resource Library/Water Conservation Programs/Relevant Research*.

Jurisdictional Conservation Program Requirements: Suggestions for Decision Makers, Cheryl Mendoza, Regional Policy and Network Advisor, Freshwater Future, 700 Fulton Avenue, Grand Haven, MI 49417

Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast, American Rivers, Inc., found at: *www.AmericanRivers.org/WaterEfficiencyReport*

*Agreement Article 203; Compact Section 4.11
**Agreement Article 201.4; Compact Section 4.9.4

Best management practices of the California Urban Water Conservation Council as found at *www.cuwcc.org* and as contained in presentations at *www.cmap.illinois.gov*.

Model Water Use Conservation Ordinance, Chicago Metropolitan Agency for Planning, March 2010, found at: *www.cmap.illinois.gov/uploadedFiles/committees/watersupply/Documents/ModelOrdinance.pdf*

These models focus on state level water conservation policy and on public water utility water conservation practices. They do not include suggestions for industrial, commercial, institutional or agricultural water conservation measures, other than as generally suggested at the state policy level or as practices of a public water supply.

It is anticipated that selecting and implementing many of the suggestions in these models will require additional information. For those interested in more detailed information about the water conservation and efficiency concepts and measures included in these models, please refer to the source documents referenced above and the Alliance for Water Efficiency Resource Library at: *www.allianceforwaterefficiency.org/resource-library*.

3. Spirit of Collaboration

Language in the regional water conservation and efficiency objectives notes that "collaboration and assistance among all governments, stakeholders and the public will be necessary to ensure that the States and Provinces are collectively able to meet these Basin-wide goals and objectives." It is in this spirit that the following model water conservation programs were developed and are provided to the state, provincial and local officials working for effective and efficient water conservation practices within the basin. It is hoped that state, provincial and local officials will consider these provisions and incorporate into their programs all that are environmentally sound and economically feasible. The environmental organizations endorsing these models will utilize them as a basis for evaluating such programs and recommending improvements.

IV. Great Lakes/St. Lawrence River State/Provincial Water Conservation and Efficiency Program Model

In presenting the following model water conservation program, it is recognized that there is variability in circumstances between the various Great Lake/St. Lawrence states and provinces. The Great Lake/St. Lawrence states and provinces are urged to adopt all of the following water conservation policies that are environmentally sound and economically feasible.

1. Mission statement

1.1. To shift water management focus beyond source water development and new physical infrastructure toward increased water productivity through water conservation and efficiency for a "no new water" approach that meets existing and new water demands through stewardship and maximum practical conservation and efficiency of existing sources to address meeting human water demands, reducing energy demands and greenhouse gases and sustaining water sources and aquatic ecosystem health.

1.2. Guiding Principles

1.2.1. Create a lasting culture of water conservation by implementing permanent water conservation programs.

1.2.2. Increase awareness and understanding of the importance and value of water as a public resource held in trust for sustaining life.

1.2.3. Promote and demonstrate stewardship and responsible management of water resources held in trust for the benefit of citizens in the Basin.

1.2.4. Encourage innovation and leadership in water conservation and efficiency.

1.2.5. Implement water conservation and efficiency measures that enhance economic viability, resiliency and economic competitiveness while preventing and minimizing waste.

1.2.6. Implement water conservation and efficiency measures that are: technically feasible; environmentally sound; socially acceptable; and cost-effective.

1.2.7. Use an adaptive approach that is accountable and measurable against established goals and objectives.

1.2.8. Periodically evaluate the program for effectiveness and areas for improvement.

1.2.9. Integrate with other environmental management practices and considerations like energy use and climate change.

1.2.10. Build on existing programs and other jurisdictions' practices and experiences.

2. Programs Objectives

2.1. Ensure equitable access to and long-term availability of water;

2.2. Protect public health and enhance quality of life;
2.3. Preserve social, natural and cultural heritage;
2.4. Prevent or minimize conflicts among water users;
2.5. Improve the ability to manage growing demand for water amid an uncertain future;
2.6. Maximize water use and energy efficiency;
2.7. Minimize the waste of water;
2.8. Promote water reuse and match water quality to the requirements of the end use through reclamation, reuse and recycling;
2.9. Prevent or delay the need for additional supplies, minimizing costs related to water and wastewater infrastructure;
2.10. Educate and inform, ensuring public access to water conservation tools and information, and share information and experiences locally and regionally;
2.11. Limit watershed withdrawals based on sustainable levels to prevent or minimize impacts, keeping sufficient water in watersheds, wetlands, and aquifers to ensure ecosystem function and health;
2.12. Develop and implement programs openly and collaboratively with water use sector stakeholders and the public by creating standing advisory boards.

3. Water Conservation and Efficiency Measures

3.1. General

3.1.1. Adopt and regularly update building, plumbing, health, land development and similar code requirements for water and energy efficient technologies.
3.1.2. Offer incentives to encourage the adoption of water conservation and efficiency best management practices
3.1.3 Support research to improve the validity of consumptive use factors
3.1.4 Establish and adjust program targets focused on continual improvement.
3.1.5 Determine which water conservation measures return the greatest value to determine priorities in conservation efforts.

3.2 Water budgets

3.2.1. Develop watershed/aquifer water budgets: a model of inflow, outflow, withdrawals and storage in a watershed's surface waters and groundwater aquifers reflecting the relationship between inputs (precipitation, groundwater inflow, and recharge), and outputs (evapotranspiration, water withdrawals and outflows) to identify stressed water sources.
3.2.2. Use water budgets to assess sustainable flow for ecological health; determine the impacts of water withdrawals; and assess community priorities that establish how shared water resources should be used.

3.3 Planning

3.3.1. Prepare and periodically update strategic long-term (25-50 years) water planning that includes water demand forecasts with various scenarios and supply impact forecasts and uses an iterative cycle (5 years) of implementation, monitoring and reassessment.
3.3.2. Require that comprehensive community land-use plans identify an adequate and sustainable water source to meet future new/increased water supply needs.
3.3.3. Promote regional growth strategies and official community plans that are consistent with watershed water budgets.
3.3.4. Direct development to areas served by existing infrastructure.

3.3.5. Periodically review and update water conservation and efficiency programs with public consultation by: defining "lessons learned" from current water conservation programs; assessing other conservation programs for use and application in the region; and assessing new water conservation technologies.

3.4 Best Management Practices (BMP)

3.4.1. Establish and promote best management practices within each water use sector and identify barriers to implementation through water conservation stakeholder teams;

3.4.2. Offer incentives to encourage the adoption of water conservation and efficiency BMP's

3.4.3. Provide training and financial support to a central organization to deliver BMP promotion, implementation, auditing, and community based social marketing services.

3.5. Water Conservation Coordinator

3.5.1. Hire skilled staff to reduce water use through: improved planning and implementation of long-term programs; guide planning and implementation of programs; monitor and adapt programs over the long term; and gather and analyze information about local patterns of water use and effectiveness of programs.

3.6. Accountability/Measurement/Reporting

3.6.1. Establish uniform water conservation and efficiency measure definitions, methods of measurement and reporting formats.

3.6.2. Establish a public annual reporting process from all water withdrawers required to have a permit under state/provincial water management programs pursuant to the Great Lakes/St. Lawrence River Basin Water Resources Compact and Agreement that: provides an accurate portrait of water withdrawals and use; uses stakeholder derived sector specific water use benchmarks against which to measure water conservation and efficiency progress; is subject to quality control checks; and addresses barriers to improvement.

3.7 Water Loss

3.7.1. Develop water loss policies in line with the American Water Works Association's (AWWA) 3rd Edition (2009) M-36 Manual: Water Audits and Loss Control Programs (*www.awwa.org*) to support an unaccounted for or unbilled water goal at the utility level that is as close to zero as practical by eliminating all losses that are economically recoverable.

3.7.2. Establish policies against the waste of publicly supplied water.

3.8. Water Rates, Conservation Pricing

3.8.1. Where state/provincial agencies such as a public service or commerce commission approve water utility rates, establish policies to promote the following:

a. Rates, based on financial and water conservation plans, reflecting impacts of water conservation plans and the full cost pricing of water and wastewater, including source protection, replacing aging infrastructure, depreciation funding; water conservation programming, education, research, and treatment of wastewater

b. Sector sensitive increasing block rates (price per block increases as consumption increases); seasonal rates (higher prices during peak periods); excess-use rates (budget based rates with prices significantly higher for use above budget levels); indoor/outdoor rates (indoor use prices are lower than outdoor uses (requires outdoor use metering)).

c. Two-part water conservation rate structures: A flat service fee covering utility fixed costs; and

consumption/commodity charges for the volume of water consumed (increasing-block rates; water-budget based; seasonal rate structures) to encourage water conservation and discourage water waste.

d. Rates that address equity for low-fixed income customers through a lifeline rate that provides a low cost first block of water.

3.9. Billing Practices

3.9.1. Develop policies for pubic water supplies that promote:

a. A monthly billing cycle;

b. Identifying water use in commonly understood units (i.e. gallons or liters, not cubic feet, cubic meters or undefined "units");

c. Clear identification of the water use portion of a bill containing charges for other services;

d. Historical comparisons to a customer's previous month and year-ago month water use;

e. Comparisons to average use by similar customers.

3.10. Incentives

3.10.1. Make water efficiency and conservation a condition for state/provincial and federal project funding, including that project sizing has taken into account water efficiency and conservation measures and is based on reasonable population and economic projections.

3.10.2. Fund water conservation practices, including audits, leak detection and repairs, comprehensive water conservation and efficiency programs, storm water management best practices, and pilot programs that advance innovative water practices such as rainwater harvesting and use of non-potable water sources. Make water efficiency and conservation measures eligible for State Revolving Fund (SRF) funding.

3.11. Public Awareness/Information, School Education Programs, Training

3.11.1. Develop and implement training opportunities in collaboration with professional and other organizations.

3.11.2. Develop education programs for different groups of end users, such as homeowners, renters, businesses, and industry.

3.11.3. Incorporate water resource and water conservation into primary and secondary school 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.

3.11.4. Develop and implement a Public Information Plan that outlines strategies and tactics to increase the public's awareness regarding the value of water as a resource held in public trust and promotes water conservation that delivers a consistent and ongoing message.

3.11.5. Encourage an awareness of the water-footprint of products to better enable citizens to make water efficient purchasing choices.

3.12. Reuse

3.12.1. Adopt laws and regulations to permit dual plumbing systems for water reuse and recycling of alternate water sources, such as gray water (filtered and untreated water collected from sinks, tubs, showers and washing machines), rainwater and stormwater for uses not requiring drinking-quality

water, such as laundry washing, toilet flushing and landscape irrigation.

3.12.2. Adopt laws and regulations to permit water reuse of municipal wastewater for uses not requiring drinking-quality water, such as landscape and agricultural irrigation; and commercial/industrial process uses.

3.13. Plumbing Fixtures and Appliances

3.13.1. Adopt and update codes to require best available high efficiency plumbing fixtures, exceeding the U.S. Energy Policy Act of 1992 requirements, that are WaterSense and Energy Star program certified, making purchasing of the most efficient available technology easy and automatic for consumers, and incentivizing development of new technology.

3.13.2. Promote the use of best available high efficiency dish and clothes washing appliances. (WaterSense and Energy Star program certified)

3.14. Recharge

3.14.1. Promote low-impact development standards to maximize on-site infiltration, including on-site retention and reuse of the first one inch of rainfall.

4. Water Withdrawal Management

4.1. Require documentation of the following by all applicants for new or increased withdrawals, consumptive use or diversions:

4.1.1. Existing water conservation practices of the applicant;

4.1.2. Applicant's proposed additional water conservation measures and implementation schedule;

4.2. Require documentation of the following by public water supply applicants for new or increased withdrawals or diversions:

4.2.1. Existing water conservation practices of the applicant and any wholesale customers; water conservation performance of the applicant and any wholesale customers as measured by at least a five year history of: population, average day flow, peak day flow, and unaccounted for losses;

4.2.2. Proposed additional water conservation measures to be implemented by the applicant and any wholesale customers, including means for compliance and implementation schedule;

4.2.3. The basis for the requested withdrawal amount grounded in reasonable population and economic forecast data, and reasonable engineering practice.

4.3. Require as a condition of public water supply permit approval for new or increased withdrawals or diversions, in accordance with an implementation schedule, active implementation by the applicant and any wholesale customers of at least those water conservation measures in the Great Lake/St. Lawrence Public Water Utility water conservation model that are preceded by an asterisk (*).

5. Adaptive Management

5.1. Periodically evaluate the water conservation and efficiency program on a schedule supporting the Compact Council's review, in cooperation with the Provinces, of water management and conservation and efficiency programs as required in Section 3.4.2, and their assessment of cumulative impacts as required in Section 4.15 of the Great Lakes St. Lawrence River Basin Water Resources Compact. Evaluate the program for effectiveness as measured against established goals and objectives.

6. Definitions

6.1. Automatic shutoff: A mechanism that must be pressed to start or stop the flow of water.

6.2. Environmentally sound and economically feasible water conservation measures: Measures, meth-

ods, technologies or practices for efficient water use and for reduction of water loss and waste or for reducing a withdrawal, consumptive use or diversion that i) are environmentally sound, ii) reflect best practices applicable to the water use sector, iii) are technically feasible and available, iv) are economically feasible and cost effective based on an analysis that considers direct and avoided economic and environmental costs and v) consider the particular facilities and processes involved, taking into account the environmental impact, age of equipment and facilities involved, the processes employed, energy impacts and other appropriate factors.

6.3. Energy Policy Act of 1992: A federal Act that defined national uniform plumbing standards among other provisions.

6.4. ENERGY STAR: A national joint energy efficiency program of the U. S. Environmental Protection Agency and the U. S. Department of Energy. *www.energystar.gov*

6.5. Single-Pass Cooling System: An equipment-related system (includes air conditioning, refrigeration and other cooling systems) that removes heat by transferring it to a water source which is then discarded after a single use/circulation.

6.6. Turf: A surface layer of earth containing a dense growth of grass and its matted roots; sod, requiring frequent watering during the growing season.

6.7. WaterSense: A national water efficiency and partnership program of the U.S. Environmental Protection Agency. *www.epa.gov/watersense*

V. Great Lakes/St. Lawrence River Public Water Utility Water Conservation and Efficiency Program Model

In presenting the following water utility model water conservation program, it is recognized that the significant variability in water utility service area conditions means that all of the following suggested water conservation practices will not be universally applicable. Utilities are urged to give consideration to the following water conservation measures, adopting all that are environmentally sound and economically feasible.

Those measures preceded by an asterisk (*) are recommended to be a requirement of state/province programs as a condition of permit approval for new or increased withdrawals or diversions by public water supplies.

It is anticipated that selecting and implementing many of the suggestions in these models will require additional information. For those interested in more detailed information about the water conservation and efficiency concepts and measures included in these models, please refer to the source documents referenced above and the Alliance for Water Efficiency Resource Library at: *www.allianceforwaterefficiency.org/resource-library*.

1. Mission Statement

1.1. To shift water management focus beyond source water development and new physical infrastructure, toward increased water productivity through water conservation and efficiency for a "no new water" approach that meets existing and new water demands through stewardship and maximum practical conservation and efficiency of existing sources to address meeting human water demands, reducing energy demands and greenhouse gases and sustaining water sources and aquatic ecosystem health.

1.2. Guiding Principles

1.2.1. To establish goals and objectives consistent with the Mission Statement

1.2.1. To consider and implement all water conservation and efficiency measures that are environmentally sound and economically feasible.

1.2.3. To establish program targets that may identify specific numeric goals for water use measurements but that are ultimately focused on continual improvement.

1.2.4. To use an adaptive approach that is accountable and measurable against established goals and objectives.

1.2.5. To assess, at not more than 5 year intervals, program performance.

2. Planning

* 2.1. Prepare and periodically update strategic long-term (25-50 years) water planning that includes

demand forecasts with various scenarios and supply impact forecasts, and that uses an iterative cycle (5 years) of implementation, monitoring and assessment.

* 2.2. Include in the comprehensive community land-use plan identification of an adequate and sustainable water source to meet future new/increased water supply needs.

2.3. Make development permits contingent on demand management practices.

2.4. Require new municipal developments to demonstrate the availability and reliability of water supply.

2.5. Off-set additional water demand from new development through reduced water use in existing development within the watershed with water efficiency measures.

2.6. Assess land use decisions for watershed impacts.

2.7. Direct development to areas served by existing infrastructure.

* 2.8. Periodically review and update water conservation and efficiency programs with public consultation by: defining "lessons learned" from current water conservation programs; assessing other conservation programs for use and application in the region; and assessing new water conservation technologies

3. Best Management Practices (BMP)

3.1. Identify and disseminate to customers sector-based best management practices.

4. Water Conservation Coordinator

4.1. Appoint a Water Conservation Coordinator to coordinate implementation of conservation programs by:

- 4.1.1. Making recommendations on relevant policy to senior officials;
- 4.1.2. Guiding planning and implementation of programs with citizen participation
- 4.1.3. Coordinating with operations and planning staff;
- 4.1.4. Preparing and submitting an annual conservation budget;
- 4.1.5. Preparing and submitting an annual conservation performance report;
- 4.1.6. Managing conservation staff, consultants and contractors;
- 4.1.7. Participating in regional/state/county water conservation initiatives; and
- 4.1.8. Developing and promoting marketing strategies for the public and industry.

5. Accountability/Measurement/Reporting

5.1. Utilize uniform water conservation and efficiency measure definitions and methods of measurement as available.

5.2. Establish a public annual reporting process that:

- 5.2.1. Provides an accurate portrait of water withdrawals and use;
- 5.2.2. Uses stakeholder derived sector specific water use benchmarks against which to measure water conservation and efficiency progress;
- 5.2.3. Reports on the performance of water conservation and efficiency measures; and
- 5.2.4. Is subject to quality control checks; and addresses barriers to improvement.

6. Water Loss: Unaccounted for or Unbilled Water

* 6.1. Annually conduct self-audits to identify unaccounted for or unbilled water (the difference between the amount of water produced versus the amount billed) based on the American Water Works Association's (AWWA) 3rd Edition (2009) M-36 Manual: Water Audits and Loss Control Programs. (*www.awwa.org*).

* 6.2. Conduct on-going system-wide leak detection and repair/maintenance programs.

* 6.3. Reduce unaccounted for or unbilled water to as close to zero as practical by eliminating all losses that are economically recoverable.
* 6.4. Track unmetered use from activities such as firefighting, water main flushing, and water main breaks.
* 6.5. Prohibit unauthorized use of hydrants. Meter use at hydrants or install automated bulk-water delivery stations to serve pool, construction and landscape contractors.

6.6. Implement a pressure management system to stabilize and reduce water pressures through the creation of multiple pressure zones.

6.7. Require leaks in private water lines to be fixed promptly upon notification by the public water supply.

7. Water Rates, Conservation Pricing

7.1. Adopt the following rate features, or, where state/provincial agencies such as a public service or commerce commission approve water utility rates, request approval of such rate features:

* 7.1.1. No decreasing block rates or outdoor water-use sewer charge credits.
* 7.1.2. Rates, based on financial and water conservation plans, reflecting impacts of water conservation plans and the full cost pricing of water and wastewater, including source protection, replacing aging infrastructure, depreciation funding; water conservation programming, education, research, and treatment of wastewater.
* 7.1.3. Sector sensitive increasing block rates (price per block increases as consumption increases); seasonal rates (higher prices during peak periods); excess-use rates (budget based rates with prices significantly higher for use above budget levels); indoor/outdoor rates (indoor use prices are lower than outdoor use prices (requires outdoor use metering)).
* 7.1.4. A two-part water conservation rate structure: A flat service fee covering utility fixed costs; and consumption/commodity charges for the volume of water consumed (increasing-block rates; water-budget based; seasonal rate structures) to encourage water conservation and discourage water waste.

7.1.5. Rates that address equity for low-fixed income customers through a lifeline rate that provides a low cost first block of water.

* 8. Billing Practices

8.1. Adopt the following billing practices:

8.1.1. A monthly billing cycle;

8.1.2. Identifying water use in commonly understood units (i.e. gallons or liters, not cubic feet, cubic meters or an undefined “unit”);

8.1.3. Clearly identify the water-use portion of a bill containing charges for other services;

8.1.4. Include historical comparisons to customer’s previous month and year-ago month use;

8.1.5. Comparisons to average use by similar customers.

9. Metering

* 9.1. Meter all water services including sub-metering for multi-residential and multi-occupancy commercial buildings.
* 9.2. Read meters and bill all water services monthly including all public and quasi-public facilities.
* 9.3. Periodically test, calibrate and replace meters to ensure accuracy.
* 9.4. Match meter size and type to water service supply;

9.5. Install “intelligent” AMR systems to reveal significant changes in use that warrant investigation (dead meter, significant leak)

9.6. Install “smart meters” to establish the information base for water-budget water rates.

10. Fixtures and Appliances

* 10.1. Adopt and regularly update building, plumbing, health, land development and similar code requirements, that exceed the U.S. Energy Policy Act of 1992 requirement by requiring Water Sense and Energy Star certified water efficient plumbing fixtures, water using appliances and water using equipment.

10.2. Collect relevant data on housing stock built prior to 1994 to estimate the number of potential units in need of plumbing retrofits (toilets, showerheads, faucets); develop a marketing strategy to reach potential customers with retrofit kits and some form of installation assistance; track the type and number of retrofits completed, devices distributed, program costs and estimated water savings.

10.3. Promote the use of best available high efficiency dish and clothes washing appliances (WaterSense and Water Star program certified) through rebates, vouchers, etc.

10.4. Require developers to include high efficiency dish and clothes washing appliances (WaterSense program certified) in new developments and renovations.

10.5. Require installation of closed system air conditioning in all new construction and remodeling.

10.6. Require water softeners that activate regeneration by demand initiation, not by a timer-based system.

10.7. Upon a change in property ownership or reconnection to the utility's system require certification that the property has plumbing fixtures/fittings (toilets, faucets, and showerheads), appliances and air conditioners that comply with the standards of the Energy Policy Act of 1992 and state and local codes if more restrictive.

11. Landscaping, Outdoor Water Use

* 11.1. Install dedicated irrigation meters for large landscapes (such as office parks, hospitals, school campuses) in conjunction with higher rates for irrigation water.
* 11.2. Require installation of improved irrigation technology such as soil moisture or rain sensors on all systems, and drip irrigation systems for small areas.

11.3. Irrigation systems shall be adjusted so that no significant amount of water falls upon or runs across impervious surfaces.

* 11.4. Promote rainwater harvesting as a source for outdoor irrigation (rain barrels).
* 11.5. Implement outdoor water irrigation time-of-day restrictions.
* 11.6. Place a surcharge on outdoor irrigation (separate metering; increasing block rates, seasonal charges, site specific water budgets, etc.).

11.7. Recommend watering schedules- duration, frequency, time of day, etc.

11.8. Conduct comprehensive outdoor water-use audits, including irrigation system audits, especially for large commercial, industrial, and institutional users.

11.9. Develop high profile pilot projects and demonstration sites including local community examples for conservation-oriented landscaping, including native and low water use plants.

11.10. Promote alternative landscape options that include native and low water use plantings that rely primarily on precipitation for irrigation, and that reduce turf in thin strips or on steep surfaces.

11.11. Include financial incentives for retrofits.

11.12. Promote turf reduction thru rebate programs ("cash for grass").

11.13. Developers shall include water-efficient landscaping and design in new developments and renovations.

11.14. Homeowner association covenants or rules shall not require water intensive landscaping or maintenance practices.

11.15. Automatic shut-off nozzles shall be placed on hand-held out-door hoses.

11.16. Perform site-specific landscape water surveys: check irrigation system and timers for maintenance and repairs; estimate or measure landscaped area; develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions; review the scheduling with customer; provide information packet to customer; and provide customer with evaluation results and water savings recommendations.

12. Water Waste Prohibition

* 12.1. Develop policies that prohibit specific wasteful activities such as:
  - 12.1.1. Gutter flushing;
  - 12.1.2. Single pass-through cooling systems;
  - 12.1.3. Non-recirculating systems in car washes and commercial laundry systems;
  - 12.1.4. Non-recycling decorative water fountains;
  - 12.1.5. Water softener regeneration initiated by timer-based control;
  - 12.1.6. Outdoor hose use without a positive shut-off nozzle;
  - 12.1.7. Irrigation runoff leaving a water-user's property;
  - 12.1.8. Failure to repair a leak.

13. Incentives

13.1. Offer Incentives to encourage the adoption of water conservation and efficiency best practices.

13.2. Invest in incentive programs that provide rebates, vouchers, swap-outs, or direct installations to retrofit water fixtures and appliances with WaterSense/Energy Star or equivalent certified units, including high efficiency clothes washers, dishwashers and ultra-low-flush and dual flush toilets.

13.3. Encourage retrofitting of wasteful fixtures and appliances upon resale of homes or establishment of a new water account.

13.4. Provide incentives to retrofit individual metering in existing master-metered multi-family and commercial buildings.

13.5. Provide financial incentives for outdoor retrofits such as "cash for grass".

14. Customer Audits

14.1. Provide free audits for all sector users to assess where the most cost-effective and water efficient savings can be secured. Audit program elements include: assess current water use (indoor and outdoor); review water bills; make water savings recommendations; make small repairs/changes/upgrades (replacing showerheads and faucet-aerators); leave water conservation literature.

15. Wholesale Agency Assistance Programs

15.1. Develop goals in cooperation with retail partners to take advantage of economies of scale for program implementation, system-wide water savings, positive public perception of good stewardship; identify effective measures and incentives; provide financial incentives; provide training or tools; and share specialized staff.

16. Conservation Programs for Commercial, Industrial and Institutional Accounts

16.1. Offer site specific water audits; conservation certification (water conservation recognition); financial and regulatory incentives, and conservation credits;

16.2. Adopt codes allowing utilization of reclaimed water and water reuse.

* 16.3. New and remodeled commercial car wash and laundry facilities shall be equipped with water recycling systems.
16.4. Drinking and eating establishments shall serve drinking water only upon request.
16.5. Commercial water using machines shall be Energy Star certified when available.

17. Reuse

17.1. Adopt laws and regulations to permit dual plumbing systems for water reuse and recycling of alternate water sources, such as gray water (filtered and untreated treated water collected from sinks, tubs, showers and washing machines), rainwater (rain barrels) and stormwater, for uses not requiring drinking-quality water, such as laundry washing, toilet flushing and landscape irrigation.
17.2. Adopt laws and regulations to permit water reuse of municipal wastewater for uses not requiring drinking-quality water, such as landscape and agricultural irrigation; and commercial/industrial process uses.

18. Public Awareness/Information

18.1. Educate the public through an outreach campaign about smart, simple, cost-effective water efficiency tools through means such as media stories, bill inserts, print, radio, billboard and cable TV ads, school programs, a user-friendly and informative website, and an ambassador program training staff to talk with the public about conservation and other water topics.
18.2. Provide periodic timely information on water use, water savings and energy savings to individual end users with information about their water use patterns by:
* 18.2.1. Billing in recognizable units of measure (gallon or liters) on a monthly basis;
* 18.2.2. Displaying water costs as separate and distinct on combined billing statements;
18.2.3. Sharing historical data to compare water use from month to month and year to year;
18.2.4. Sharing comparisons to other/average users; and
18.2.5. through lawn care workshops, in-home and business water audits.
* 18.3. Develop and implement a Public Information Plan that outlines strategies and tactics to increase the public's awareness regarding the value of water as a resource held in public trust and promote water conservation that delivers a consistent and ongoing message.
18.4. Encourage an awareness of the water-footprint of products to better enable citizens to make water efficient purchasing choices.

19. Adaptive Management

19.1. Periodically evaluate and update the water conservation and efficiency program at intervals not exceeding five years.
19.2. Assess the program for effectiveness as measured against established goals, objectives and targets.
19.3. Reevaluate and update goals, objectives, targets, sector best management practices and other program areas as appropriate.

20. Definitions

20.1. Automatic shutoff: A mechanism that must be pressed to start or stop the flow of water.
20.2. Environmentally sound and economically feasible water conservation measures: Measures, methods, technologies or practices for efficient water use and for reduction of water loss and waste or for reducing a withdrawal, consumptive use or diversion that i) are environmentally sound, ii) reflect best practices applicable to the water use sector, iii) are technically feasible and available, iv) are economically feasible and cost effective based on an analysis that considers direct and

avoided economic and environmental costs and v) consider the particular facilities and processes involved, taking into account the environmental impact, age of equipment and facilities involved, the processes employed, energy impacts and other appropriate factors.

20.3. Energy Policy Act of 1992: A federal Act that defined national uniform plumbing standards among other provisions.

20.4. ENERGY STAR: A national joint energy efficiency program of the U. S. Environmental Protection Agency and the U. S. Department of Energy. *www.energystar.gov*

20.5. Single-Pass Cooling System: An equipment-related system (includes air conditioning, refrigeration and other cooling systems) that removes heat by transferring it to a water source which is then discarded after a single use/circulation.

20.6. Turf: A surface layer of earth containing a dense growth of grass and its matted roots; sod, requiring frequent watering during the growing season.

20.7. WaterSense: A national water efficiency and partnership program of the U.S. Environmental Protection Agency. *www.epa.gov/watersense*

* Water conservation measures preceded by an asterisk (*) are recommended in the State/Provincial Water Conservation and Efficiency Program Model to be required as a condition of permit approval for new or increased withdrawals or diversions.

APPENDIX A

Great Lakes/St. Lawrence River Regional Water Conservation and Efficiency Objectives

Guide programs toward long-term sustainable water use.

- Use adaptive programs that are goal-based, accountable and measurable.
- Develop and implement programs openly and collaboratively, including with local stakeholders, Tribes and First Nations, governments and the public.
- Prepare and maintain long-term water demand forecasts.
- Develop long-term strategies that incorporate water conservation and efficient water use.
- Review and build upon existing planning efforts by considering practices and experiences from other jurisdictions.

Adopt and implement supply and demand management to promote efficient use and conservation of water resources.

- Maximize water use efficiency and minimize waste of water.
- Promote appropriate innovative technology for water reuse.
- Conserve and manage existing water supplies to prevent or delay the demand for and development of additional supplies.
- Provide incentives to encourage efficient water use and conservation.
- Include water conservation and efficiency in the review of proposed new or increased uses.
- Promote investment in and maintenance of efficient water infrastructure and green infrastructure.

Improve monitoring and standardize data reporting among State and Provincial water conservation and efficiency programs.

- Improve the measurement and evaluation of water conservation and water use efficiency.
- Encourage measures to monitor, account for, and minimize water loss.
- Track and report program progress and effectiveness.

Develop science, technology and research.

- Encourage the identification and sharing of innovative management practices and state of the art technologies.
- Encourage research, development and implementation of water use and efficiency and water conservation technologies.
- Seek a greater understanding of traditional knowledge and practices of Basin First Nations and Tribes.
- Strengthen scientific understanding of the linkages between water conservation practices and ecological responses.

Develop education programs and information sharing for all water users.

- Ensure equitable public access to water conservation and efficiency tools and information.
- Inform, educate and increase awareness regarding water use, conservation and efficiency and the importance of water. Promote the cost-saving aspect of water conservation and efficiency for both short-term and long-term economic sustainability.
- Share conservation and efficiency experiences, including successes and lessons learned across the Basin.
- Enhance and contribute to regional information sharing.
- Encourage and increase training opportunities in collaboration with professional or other organizations in order to increase water conservation and efficiency practices and technological applications.
- Ensure that conservation programs are transparent and that information is readily available.
- Aid in the development and dissemination of sector-based best management practices and results achieved.
- Seek opportunities for the sharing of traditional knowledge and practices of Basin First Nations and Tribes.

ALLIANCE FOR THE GREAT LAKES

ENSURING A LIVING RESOURCE FOR ALL GENERATIONS

About Alliance for the Great Lakes

Alliance for the Great Lakes serves as the voice of the 40 million people who rely on Great Lakes water for drinking, recreation and commerce. Formed in 1970, it is the oldest independent Great Lakes protection organization in North America. Its mission is to conserve and restore the world's largest freshwater resource using policy, education and local efforts, ensuring a healthy Great Lakes and clean water for generations of people and wildlife. Its headquarters are in Chicago, with offices in Cleveland, Grand Haven, and Milwaukee.

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