Water Management Planning
for
Indiana Significant Water Withdrawal Facilities

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Suggested Water Management Planning Guidelines

1. Introduction & Objectives

The Indiana Department of Natural Resources has developed these recommendations and guidelines to provide assistance in identifying appropriate water management practices and aid in the development of water conservation & efficiency plans for all registered use types in the Great Lakes Basin, under the Significant Water Withdrawal Facility program and the Great Lakes Compact. (IC 14-25-7-15 & IC 14-25-15-5)

The purpose of this voluntary water conservation plan is to:

- To reduce water consumption from the levels that would exist without conservation efforts;
- To reduce the loss and waste of water;
- To encourage improvement of processes that inefficiently consume water;
- To extend the life of current supplies by reducing the rate of growth in demand;
- To document the level of recycling and reuse in the water supply.

The water management planning suggestions included in this document are intended to serve as a guide. The following plan framework (see Appendix C) is intended to assist facilities in meeting the voluntary conservation and efficiency requirements under the Great Lakes Compact for new or increased water withdrawals by demonstrating progress towards water conservation and efficiency improvements. Adoption of water conservation and efficiency measures statewide for existing water users is also considered voluntary.

2. Description of Water Use

Registered significant water withdrawal facilities should document how water is used throughout the facility's processes.

- The facility provides information including:
    - How water moves through their system;
    - Identification of primary and secondary significant water use processes, equipment, and operations;
    - What purpose the water serves in the production process;
    - How much water is consumed in the production process and is not available for reuse;
    - Means of discharging water used in industrial processes;
    - Identify and quantify cost parameters associated with water usage where practical.

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3. Specifications of Water Conservation Goals

The Great Lakes Compact suggests that each registered water user in the Great Lakes Basin adopt quantifiable water conservation goals in their water management plan. Facilities should specify a five-year target for water savings. *[Include quantifiable water savings targets and the details of the basis for the development of these goals in the Water Management Plan Report.]*

Goals for this water conservation plan may include the following:

- Identification of Potential Goals:
  - Whole System Maintenance: Identification of leaks in delivery and distribution, preservation of optimal operation pressure, gauge maintenance, regular testing, system calibration etc.;
  - Metering and submetering at all levels of water use;
  - System Controls Improvements: Implementation of a comprehensive water accounting and loss control program including system inspections, universal metering, leak detection, and repair;
  - Improve, modify, or audit processes in order to increase efficient water use.

4. Metering of Water Use

- A facility's water use may be metered at a specific location(s). Submetering is a good strategy for many high capacity water users. Processes or equipment that consume large quantities of water could be usefully submetered. Submetering is an effective means to account for all water used by process, or by piece of equipment in a facility. *[Identify processes and equipment that are currently metered or submetered in the Water Management Plan Report.]*

5. Control of Unaccounted for Water and Leak Detection and Repair

Careful metering of water use, detection, and repair of leaks in the distribution system and regular monitoring of unaccounted water are important in controlling losses. Unaccounted for water is the difference between water delivered to a system and water delivered to a system plus authorized but unmetered uses. Authorized but unmetered uses include water used for fire fighting, releases for flushing of lines, and water used during new construction. Unaccounted for water can be attributed to several things including:

- Regularly inspect system for leaks and promptly repair in order to control unaccounted for water;

- Inaccuracies in meters. Older meters or meters in disrepair can under report or over report actual use;

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- Other *[Please identify other potential causes unaccounted for water in the Water Management Plan Report.]*

In order to better control unaccounted for water, facilities are asked to watch for and report main breaks and leaks. Broken and leaking lines should be replaced or repaired in a timely manner. Meter readers are asked to report any concerns immediately.

Facilities may implement and maintain a water loss program. This program would serve to reduce losses due to leakage. Measures implemented in a water loss program can include *[select the applicable measures]:*

- Conducting regular inspections of water main fittings and connections
- Installation of leak detectors and loggers
- Using a leak modeling program
- Controlling the pressure just above the minimum standard-of-service level
- Limiting surges in pressure
- Metering individual pressure zones
- Other *[Please specify other measures taken to reduce water loss in the Water Management Plan Report.]*

6. Auditing, Modifying, and Improving Processes and Equipment

Facilities can increase water efficiency by improving modifying and auditing facility processes and equipment. Water can be conserved through the following measures *[select appropriate measures]*:

- Accurate accounting for all water into and out of a system or process;
- Implement metering and submetering at all levels;
- Establishing a Conservation Coordinator or Water Conservation Manager to develop and carry out the water management plan;
- Optimizing the water-use efficiency of cooling systems (other than cooling towers) by implementing closed loop recirculation systems;
- Consider opportunities for water reclamation and reuse;
- Education and involvement of employees in water conservation & efficiency initiatives;
- Invite presentations and seminars by appropriate agencies or organizations.

7. Implementation and Modifications to Water Conservation Plan

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Upon implementation of a water management plan, the facility is encouraged to adopt a standard period for plan review. A review period may allow a facility to assess and update the plan on a regular basis; every five years being a recommended time span. New goals may then be based on previously identified five year goals, changes in facility processes, and any new information.

Following adoption of a water management plan, an implementation report can be prepared for an annual voluntary internal review. *[A sample report is included in Appendix C.]* This report may include:

- Efforts made in conservation and efficiency planning already in place;
- The list of dates and descriptions of conservation and efficiency measures or best management practices (BMPs) implemented;
- Conservation and efficiency goals;
- Amount of water saved;
- Whether or not targets in the plan were met;
- If targets are not met, the plan may be used as a means to identify why the targets were not met and provide a framework for discussion of the progress needed to meet or adjust the targeted goals.

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APPENDIX A

Indiana's Water Management Policy

Indiana's water resources are public goods that generate benefits for all citizens of the State. The wise use of water through environmentally sound and economically feasible water management practices is essential to maximize the benefits obtained from water resources and sustain them for future generations. To achieve these goals, Indiana promotes the following:

1) Public education and outreach that identifies appropriate water management practices and water conservation methods, and stresses the economic, environmental, and social benefits of wise water management;

2) Appropriate water pricing and incentive structures, such as increasing block rate pricing and water rates that increase during water shortages;

3) Development of a Statewide Water Management Plan that promotes improvements in water management practices, such as watering lawns, gardens, and farm fields efficiently, using water efficient fixtures in homes and businesses, using drought resistant landscape practices, and using reclaimed or lower quality water for irrigation, industrial, and other appropriate non-potable uses;

4) Identification and dissemination of water management practices, such as demand and supply analyses, that will increase water use efficiency;

5) The application and sharing of available science and research regarding water management, water conservation, and water use efficiency; and

6) Funding of a water management and water use efficiency program by user fees established by legislative directive.

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APPENDIX B

Great Lakes Compact Conservation & Efficiency Objectives

GREAT LAKES—ST. LAWRENCE RIVER WATER RESOURCES REGIONAL BODY RESOLUTION #6—ADOPTION OF BASIN-WIDE CONSERVATION AND EFFICIENCY OBJECTIVES

WHEREAS, on December 13, 2005, the Governors of the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio and Wisconsin, the Commonwealth of Pennsylvania, and the Premiers of Ontario and Québec signed the *Great Lakes—St. Lawrence River Basin Sustainable Water Resources Agreement* ("Agreement"); and,
WHEREAS, Article 304 paragraph 1 of the Agreement came into force on December 13, 2005, pursuant to Article 709 paragraph 1g of the Agreement; and,
WHEREAS, Article 304 paragraph 1 of the Agreement states that:
"Within two years of the signing of the Agreement, the Regional Body shall identify Basin-wide Water conservation and efficiency objectives to assist the Parties in developing their Water conservation and efficiency program. These objectives shall be based on the goals of:
a. Ensuring improvement of the Waters and Water Dependent Natural Resources;
b. Protecting and restoring the hydrologic and ecosystem integrity of the Basin;
c. Retaining the quantity of surface water and groundwater in the Basin;
d. Ensuring sustainable use of Waters of the Basin; and,
e. Promoting the efficiency of use and reducing losses and waste of Water."; and,
WHEREAS, the two year anniversary of the signing of the Agreement is December 13, 2007; and,
WHEREAS, the Council of Great Lakes Governors created a Great Lakes Water Conservation and Efficiency Initiative and appointed a Committee of Great Lakes State and Provincial representatives, the objective of which was to provide recommendations to the Regional Body regarding basin-wide water conservation and efficiency objectives to fulfill the Regional Body's obligations in Article 304 paragraph 1 of the Agreement; and,
WHEREAS, when drafting its recommendations, the Committee met with and invited the input of an Advisory Panel of regional stakeholders and consulted with Great Lakes Tribes and First Nations; invited public comment from March 15-June 8, 2007 on draft regional water conservation and efficiency objectives; and, revised the draft objectives following a review of the public comments; and,
WHEREAS, on August 21, 2007, the Committee submitted recommendations for basinwide conservation and efficiency objectives (Attachment "A") to the Regional Body for its consideration.
NOW THEREFORE BE IT RESOLVED that in fulfillment of its obligations under Article 304 paragraph 1 of the Agreement, the members of the Regional Body adopt as basin-wide conservation and efficiency objectives the recommendations submitted by the Council of Great Lakes Governors' Committee as included in Attachment "A."

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GREAT LAKES—ST. LAWRENCE RIVER BASIN WATER CONSERVATION AND EFFICIENCY INITIATIVE BACKGROUND

The Great Lakes Governors and Premiers signed the Great Lakes—St. Lawrence River Basin Sustainable Water Resources Agreement (Agreement) on December 13, 2005. This Agreement created the Great Lakes-St. Lawrence River Water Resources Regional Body (Regional Body), comprising the Governors and Premiers, to further coordinate implementation of its terms. Pursuant to Article 304(1) of the Agreement, the Regional Body will adopt regional water conservation and efficiency objectives by December 13, 2007. These objectives are intended to be broad, overarching concepts which will provide context for further State and Provincial action that will be more specific in nature.

The process for developing the regional water conservation and efficiency objectives was intended to be open and transparent. Regional stakeholders were asked to provide technical information, make recommendations and foster communication with interested organizations and individuals. Representatives of Tribes and First Nations were also engaged and asked to share their experience and traditional knowledge. Additionally, public was sought through a formal public comment period. Once finalized and adopted by the Regional Body, the regional objectives will then be used to inform the development of individual State and Provincial water conservation and efficiency goals and objectives. These goals and objectives will in turn shape State and Provincial water conservation programs that will be more specific in nature. The Agreement also provides direction to ensure that the States and Provinces, along with the Regional Body, undertake periodic reviews of their water conservation programs. Additionally, the regional objectives, as well as reports prepared by each State and Province on their programs, will be reviewed by the Regional Body every five years.

INTRODUCTION

Efficient and responsible water use is a cornerstone of sound water management policy, whether the resource is considered abundant or scarce. Efficient use and conservation of our water resources can:

- Ensure equitable access to and long-term availability of water;
- Protect public health and enhance quality of life;
- Minimize impacts of water use to support healthy aquatic ecosystems of the Great Lakes and St. Lawrence River Basin;
- Minimize costs related to water and wastewater infrastructure;
- Preserve social and cultural heritage;
- Prevent or minimize conflicts among water users;
- Enhance economic viability and competitiveness of the region;
- Support reductions in energy use and greenhouse gas emissions;
- Improve the ability to manage an uncertain future and growing demand for water; and,
- Demonstrate that the region's citizens are prudent stewards of the resource.

These Basin-wide goals and objectives are intended to complement other water conservation and efficiency efforts consistent with water quality objectives. They will accelerate intergovernmental and other partnerships including, for example, partnerships with Basin Tribes and First Nations to build a greater understanding and consideration of traditional knowledge and practices. Whether accomplished through voluntary, mandatory, or a combination of measures, to be successful, these goals and objectives need to be broadly supported. Regional 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 Basinwide goals and objectives.

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GOALS—As stated in the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement

1. Ensuring improvement of the waters and water dependent natural resources;
2. Protecting and restoring the hydrologic and ecosystem integrity of the Basin;
3. Retaining the quantity of surface water and groundwater in the Basin;
4. Ensuring sustainable use of waters of the Basin; and,
5. Promoting the efficiency of use and reducing losses and waste of water.

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.

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• 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.

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APPENDIX C

Sample
Water Management Plan Report
For Conservation & Efficiency

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Water Management Plan Report

Facility Name: _____

Registration Number: _____

Date: _____

Current Water Management Planning and Conservation & Efficiency Efforts:

For facilities that currently have a Water Management Plan in place that includes measures to achieve improvements in conservation and efficiency that satisfy the voluntary requirements under the Great Lakes Compact; please attach that plan to this report framework and track Water Management Plan progress by providing the applicable descriptions under Evaluation and Modification.

Current Water Usage:

An important component of any water management plan is the characterization of the facility's current water usage. This includes indentifying how water moves through a facility or system, identifying the purpose of water within the facility or system, identifying specific equipment involved, identifying how water is discharged from the system, and identifying and quantifying the cost considerations associated with current water usage.

Provide the following information:

- Describe the source of water at the facility
- Identify significant use processes, operations, or equipment
- Describe water metering and water use tracking, if any
- Identification of Areas of Potential Water Loss
- Describe leak prevention and repair programs, if any
- Identify current water reclamation or reuse strategies, if any
- Identify how much water is consumed and not available for reuse
- Identify how much water is discharged
- Identify and quantify to extent practicable the cost parameters associated with water usage.

1) Describe Water Sources
   [Facility adds description here]

2) Describe Significant Water Use
   [Facility adds description here]

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3) Describe Water Metering and Tracking
   [Facility adds description here]

4) Identification of Potential Water Loss
   [Facility adds description here]

5) Reclamation and Reuse
   [Facility adds description here]

6) Means of Discharging Water
   [Facility adds description here]

Selection of Conservation and Efficiency Goals:

Implementation of Best Management Practices [BMPs] for water conservation planning and improving water use efficiency are an important component of this management plan. This list contains examples that might be considered by a facility and are not to be considered complete or mandatory. No one set of BMPs would be appropriate for, or applicable to, all facilities.

(Check those that apply)

- ☐ Install water meters in high use areas to encourage conservation and accountability.
- ☐ Submeter at each process or piece of equipment that consumes large quantities of water.
- ☐ Develop meter maintenance plan and replace old inaccurate meters.
- ☐ Develop system wide maintenance to enhance conservation objectives.
- ☐ Retrofit applications that use once-through cooling water (chillers, compressors, condensers, etc.) with closed-loop recirculation systems.
- ☐ Replace water-cooled equipment with air cooled equipment.
- ☐ Install cooling towers to reduce once-through cooling water use, where cost-effective and otherwise appropriate.
- ☐ Replace liquid ring vacuum pumps with mechanical seal vacuum pumps.
- ☐ Use clean in place technologies.
- ☐ Operate pumps to meet, but not exceed, process rates to reduce excessive pumping.
- ☐ Consider the installation of surge tanks to prevent overflow or the installation of float controlled valves on makeup water lines.
- ☐ Turn off water consuming equipment that is not in use and during shutdowns.

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- ☐ Calibrate and clean process equipment to enhance thermal and hydraulic performance efficiency.
- ☐ Install flow restrictors, aerators, spring-loaded valves and timers on faucets and nozzles.
- ☐ Use fogging nozzles or mist eliminators to minimize water losses in cooling towers.
- ☐ Investigate alternative water sources for major processes, including using clarified, cooling or waste water for certain processes.
- ☐ Investigate process and equipment upgrades that result in more efficient operations and water use, (e.g. adjusting water intake design and pump speed, increasing efficiency of the whitewater system in the mill).
- ☐ Install high-pressure, low-volume shower heads and low-flow or waterless toilets.
- ☐ Consider chemical treatments to reduce the amount of make-up water required for cooling towers, steam boilers, etc.
- ☐ Consider landscape alterations that demand less watering and prevent less runoff.
- ☐ Monitor drought and water stress conditions regionally and communicate awareness issues throughout the organization.
- ☐ Install drip irrigation to reduce watering use.
- ☐ Implement irrigation scheduling program.
- ☐ Consider opportunities for water reclamation and reuse throughout the process and facility.
- ☐ Include water conservation policies and procedures into employee training programs.
- ☐ Participate in water conservation advisory group or organization to raise awareness.
- ☐ Incorporate water conservation practices into employee training programs.
- ☐ Implement leak detection and repair programs to mitigate water losses.

- ☐ Other [please specify]:

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Evaluation and Modification of Water Management Plans

Upon implementation of this Water Management Plan, the *[facility]* will evaluate and update the plan on a periodic basis. Modifications to the plan will be based upon an evaluation of previously selected BMPs and any new relevant information or changes in processes. This evaluation is intended to satisfy the requirements for periodic review under the Great Lakes Compact.

The *[Facility]* will consider documenting the following information to evaluate the existing Plan:

- A list of dates and descriptions of conservation measures implemented
  [Facility adds description here]

- Means used to quantify water savings
  [Facility adds description here]

- Approximate amounts of water saved for each measure implemented
  [Facility adds description here]

- Discussion about whether or not the goals of the plan have been met
  [Facility adds description here]

• If objectives were not met, an explanation as to the reason why the objectives were not met and a discussion of the specific revisions to the Plan intended to help meet the objectives in the future.
[Facility adds description here]

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