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STATE OF MICHIGAN
OFFICE OF THE GREAT LAKES
LANSING



JON W. ALLAN
DIRECTOR

November 21, 2017

Mr. David Naftzger, Executive Director
Great Lakes-St. Lawrence River Basin Water Resources Council
Secretary, Great Lakes-St. Lawrence River Water Resources Regional Body
Conference of Great Lakes and St. Lawrence Governors and Premiers
20 North Wacker Drive, Suite 2700
Chicago, Illinois 60606

Dear Mr. Naftzger:

SUBJECT: 2017 Water Conservation and Efficiency Program Annual Assessment
Submitted on behalf of the State of Michigan

On behalf of the State of Michigan, please find enclosed our 2017 Water Conservation and Efficiency Program Annual Assessment being sent pursuant to and in satisfaction of the obligations included in Section 4.2.2 of the Great Lakes-St. Lawrence River Basin Water Resources Compact. Please note that these reports are subject to revision and update during the course of the Compact Council and Regional Body program review process.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Jon W. Allan
Director

Enclosure

cc: James Milne, Michigan Department of Environmental Quality
Grant Trigger, Racer Trust
Peter Johnson, Conference of Great Lakes St. Lawrence Governors and Premiers

**Great Lakes-St. Lawrence River Basin Water Resources Compact
Water Conservation and Efficiency Program Annual Assessment**

State of Michigan

November 21, 2017

This Water Conservation and Efficiency Program Annual Assessment fulfills Michigan's obligation under Section 4.2.2 of the Great Lakes-St. Lawrence River Basin Water Resources Compact.

LEAD AGENCY AND OFFICE CONTACTS

The Michigan Department of Environmental Quality (MDEQ) Water Use Program is the lead agency responsible for Michigan's water conservation and efficiency program.

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**STATUS OF MICHIGAN'S WATER CONSERVATION AND EFFICIENCY GOALS
AND OBJECTIVES**

The Michigan Department of Environmental Quality (MDEQ) established the Water Use Advisory Council (WUAC) in 2013 to collaboratively study, evaluate and provide advice regarding Michigan's water management, conservation, and efficiency programs. These open and ongoing discussions keep the staff of these programs informed on the effectiveness and progress of these programs, providing valuable insight to guide Michigan's efforts to improve water conservation and efficient use of water.

Currently, MDEQ is working with other state agencies and stakeholders to implement Michigan's Water Strategy, an all-inclusive 30-year vision and blueprint to ensure Michigan's water resources continue to support healthy ecosystems, communities, and economies for current and future generations. The plan was collaboratively developed by state agencies and refined as a result of extensive engagement and input from nongovernmental organizations, environmental groups, communities, industry leaders, tribal governments, and others. MDEQ is currently reviewing and assessing policies and practices concerning water conservation within Michigan's agriculture and

thermoelectric industries. Examining two of the largest water using sectors in Michigan will help gain insight into their current water conservation practices and any new and innovative efforts to conserve water or improve efficiency. As part of implementation of the strategy, in 2018 the MDEQ will convene agency partners and stakeholders to begin a process to prioritize water conservation recommendations within the Water Strategy and those recommended by the WUAC to continue progress toward improving Michigan's overall water conservation and efficiency efforts.

Appendix 1 provides a full list of water conservation and efficiency recommendations from the Water Strategy, as well as a link to the WUAC water conservation and efficiency recommendations.

WATER CONSERVATION AND EFFICIENCY PROGRAM OVERVIEW

Michigan's water conservation and efficiency program is founded on the water withdrawal assessment requirement that applies to all new or increased large quantity withdrawals (LQWs). The assessment process evaluates proposed water withdrawals relative to the environmental impact standards set for conserving and protecting the water resources of the Great Lakes Basin (MCL 324.32705). Through the assessment process, the likely resource impacts of a proposed withdrawal must meet the environmental impact standard and be authorized by MDEQ before the withdrawal can begin (MCL 324.32706b, 324.32706c, 324.32723). To gain authorization to make a LQW after a site-specific review, water users consider conservation and efficiency of use as a means to reduce their impact. LQWs are cumulatively tracked and accounted for against the environmental standard at a sub-watershed scale, ensuring that the water resources of the basin are conserved even at a small scale (MCL 324.32706e).

In conjunction with annual water use reporting that is required for LQWs, owners are required to review water conservation measures applicable to their water use sector. Implementation of conservation measures is voluntary (MCL 324.32707, 324.32708). In sub-watersheds that are approaching the environmental impact standard, as a condition of approval an applicant must implement the water conservation measures they deem to be reasonable (MCL 324.32706c, 325.1004). For applications greater than 2 MGD capacity, it is required that all sector or withdrawal-based conservation measures are complied with as a condition of approval (MCL 324.32723).

In Michigan, where water resources are generally plentiful and true conflicts over its use are somewhat rare, there is a challenge in motivating citizens and governing bodies to work towards conservation and efficiency program development. The WUAC is an integral part of the program for raising the issue and establishes an integrated framework of roles and responsibilities for all stakeholders in managing Michigan's water resources. This framework creates opportunities for involvement by the public,

university researchers, industry professionals, advocacy groups, and other interested parties to work directly with state agency personnel to set policy and shape the direction of the program. This promotes better understanding and cooperation to the benefit of the program, and results in shared investment in the management and sustainability of Michigan's streams, lakes, wetlands, and groundwater.

**WATER CONSERVATION AND EFFICIENCY PROGRAM CONSISTENCY WITH
REGIONAL OBJECTIVES, AND THE PROMOTION OF ENVIRONMENTALLY
SOUND AND ECONOMICALLY FEASIBLE WATER CONSERVATION MEASURES**

Compact's Water Conservation and Efficiency Objectives	Summary of Current Efforts
I. Guide programs toward long-term sustainable water use.	<ul style="list-style-type: none"> • Regulatory framework that requires resource conservation • Adaptive programs that integrate new data, methods, and policies in response to changing environmental conditions
II. Adopt and implement supply and demand management to promote efficient use and conservation of water resources.	<ul style="list-style-type: none"> • Sub-watershed scale cumulative impact limits for withdrawals • Notification of nearby water users and local government when limits are approached • Restrictions on withdrawals when local impact would exceed limit or is unreasonable
III. Improve monitoring and standardize data reporting within water conservation and efficiency programs.	<ul style="list-style-type: none"> • Increased water use reporting data quality • Outreach initiative to bring into compliance previously unreported water uses
IV. Develop science, technology, and research.	<ul style="list-style-type: none"> • \$1.4 million geological, hydrogeological, and hydrological data collection and analysis regional pilot study • \$320,000 study to document the response of stream flow to high-capacity groundwater pumping and develop groundwater models • State/federal glacial geology mapping partnership • More than 75 streamflow measurement locations added in high water use areas • Increased use of site-specific data and regional withdrawal impact models
V. Develop education programs and information sharing for all water users.	<ul style="list-style-type: none"> • Stakeholder committee formed to improve outreach and communication about water use in Michigan and Michigan's Water Use Program • Annual agriculture irrigation practices workshops • Additional water use data made available online • Water use data published in media outlets

I. Guide programs toward long-term sustainable water use.

Michigan's LQW assessment process, environmental impact standard, and cumulative impact tracking system have effected significant changes in the planning and development of LQWs. This process has driven the integration of long-term sustainable water use concepts into water management decisions, and has raised the awareness of water use and resource impact implications. The LQW assessment process is designed to be adaptive and able to respond to changing environmental conditions. Additional hydrologic data is continually being collected, and combined with refined models for better decision-making, the LQW assessment methods and policies keep up with current understanding to ensure long-term sustainable water use.

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

The MDEQ works with many water users and industry contractors on an individual basis throughout the assessment process to ensure withdrawals are implemented in an efficient manner that reduces the impact to water resources. This assessment process incorporates both supply-side management of the water resources using a specialized database that tracks cumulative impact of withdrawals at the sub-watershed level, and demand-side management by notifying all affected water users when withdrawal limits begin to be approached in an area. Michigan's common law reasonable use doctrine is the legal foundation underlying the assessment process, and also promotes the conservation and efficient use of water in its own way when conveying to water users that water is a shared, finite resource under this doctrine. Users are encouraged to conserve up front, rather than when required to in the event of a conflict situation when supplies are limited or overtaxed.

III. Improve monitoring and standardize data reporting within water conservation and efficiency programs.

Measurement and evaluation of water conservation and water use efficiency, and changes over time remain difficult to track from an agency perspective. Ongoing improvements to electronic data collection systems and databases and use of new tools are resulting in better consistency in water use data collection, and a better ability to identify trends in water use and account for variability. Additional resources are being allocated to conduct further review of data collected to ensure data accuracy and quality. Compliance with reporting requirements by water users is being increased through a special outreach initiative currently underway to identify, and bring into compliance previously unreported water uses. Michigan's Water Strategy also includes a recommendation to create a coordinated strategy for groundwater data collection, including a data management system. Such data is a critical measurement and indicator of the effects of water use and the effects of water conservation and efficiency practices. State and federal agencies, research

institutions and stakeholders continue to assess available groundwater data and develop strategies for effective data integration to advance coordinated water monitoring programs and improve decision making.

IV. Develop science, technology, and research.

Michigan is actively developing science, technology, and research on an ongoing basis through the efforts of various projects by state, federal, and academic institutions. Michigan has identified scientific data collection as a primary need in order to make better-informed decisions when assessing proposed new water uses. Michigan is funding several research projects in high water use areas to better understand the groundwater-surface water interaction. Michigan is also part of a state/federal partnership to conduct more detailed mapping of Michigan's glacial geology. This data will be used to improve the assessment and forecasting of new water uses' impact on the resource through increased use of site-specific data and more localized regional models. Increasing and improving the quality of data is imperative to effectively promote proactive conservation and efficient use to water users before obvious shortage issues occur. Michigan is investing in this data now more than ever, including through cooperative cost-sharing agreements with federal agencies and private industry groups. The WUAC convened scientific and policy discussions amongst stakeholders and technical experts to evaluate Michigan's water management and water conservation and efficiency programs, and identified where improvements and updates could be made. Many of these recommendations are also reiterated in Michigan's Water Strategy. The development of science, technology, and research in the water conservation field is in early stages, as Michigan strives to convey its importance prior to potential issues such as regional shortage or conflict.

V. Develop education programs and information sharing for all water users.

A dedicated educational program has not been developed in Michigan; however, recognizing the growing importance and interest in water use issues, the MDEQ has recently formed a committee of WUAC members to enhance communication and outreach related to water use in Michigan and Michigan's Water Use program targeting program stakeholders and the general public. The committee will focus on the Water Use Program including, but not limited to, the goals of the Great Lakes Compact and Michigan's implementing legislation; withdrawal regulations; decision making framework, including the LQW assessment process; the availability of water for withdrawal; and water use in the state of Michigan.

The MDEQ and Michigan Department of Agriculture and Rural Development staff makes educational presentations and shares information at various conferences and meetings, and to interested parties in personal communication. The WUAC and its subcommittee meetings are open to the public and provide educational opportunities

and information sharing for water users and water managers. Meeting notes and informational materials from the WUAC proceedings are posted on the MDEQ webpage. Increased access to data and awareness of water use by the public has been accomplished by publishing additional water use data online, at public information meetings, and in various media outlets. In addition, the MDEQ provides webinars, conferences, training, and information for businesses and industry to support enhanced water conservation and efficiency. Michigan State University Extension also convenes meetings around the state with agricultural water users to share information about conservation practices for irrigation. Other efforts are ongoing to promote water stewardship through outreach, education, and development of effective statewide communication strategies to improve the public's understanding of their impact on water resource and actions and behaviors that support responsible water use.

Appendix 2 provides a full list of the water conservation and efficiency goals and objectives of Michigan's Water Conservation and Efficiency Programs.

WATER CONSERVATION AND EFFICIENCY PROGRAM IMPLEMENTATION TIMELINE AND STATUS

Michigan's water conservation and efficiency program is being implemented. The foundation of the program, the water withdrawal assessment process, has been in effect since 2009. Sector-based water conservation measures are required to be reviewed annually by all large water users. From the beginning, it has been recognized that the program would continually adapt and that the staff would be open to changes necessary for improvement and enhancement. Michigan has shown a strong commitment to this forward-looking approach, continuing to improve its program and remains dedicated to the betterment of the program and to upholding the ideals of the Compact.

APPENDIX 1: WATER CONSERVATION AND EFFICIENCY RECOMMENDATIONS FROM MICHIGAN'S WATER STRATEGY

Goal 1: Michigan citizens are stewards of clean water and healthy aquatic ecosystems.

Outcome: Individuals and communities understand their responsibility for and make informed and responsible decisions regarding water resources.

Recommendations:

1-2: The State, working with stakeholders, will develop a public outreach campaign that highlights stewardship practices and encourages actions that sustain water resources.

Goal 2: Michigan's aquatic ecosystems are healthy and functional.

Outcome: Aquatic systems are resilient and diverse.

Recommendations:

2-8: Incorporate planning for wet weather extremes, droughts, and increased seasonal variability of precipitation into state, regional, and community planning to mitigate impacts to ecological, economic, social and cultural resources.

2-11: The State, working with tribal governments and stakeholders, will establish new partnerships to develop innovative strategies to enhance wetland restoration and green infrastructure efforts in Michigan. The Tribes will work with the State to elevate the recognition, protection, and restoration of native wild rice stands throughout the state.

2-14: Refine and improve the water withdrawal assessment process and model to ensure sustainable use of water resources and that high priority is given to incorporating existing and new data to better represent local and regional water resources and surface water/groundwater interactions.

2-15: Provide technical and financial support to communities and their partners to plan and implement green infrastructure techniques and low-impact development while preserving natural spaces that contribute to water quality, including application of these techniques in the design of new developments, redevelopments, and road projects to ensure storm water management, improved hydrology, and overall water quality.

2-16: Modernize road and highway planning and infrastructure and integrate with watershed planning to effectively accommodate storm water runoff and infiltration needs, thereby reducing the costs and impacts of flooding.

2-17: Enhance financial and technical support of local stakeholder efforts to develop and implement watershed management plans to restore impaired waters, protect high quality waters, and develop and utilize local water resource assets.

Goal 3: Michigan communities use water as a strategic asset for community and economic development.

Outcome: Economic and community development plans and efforts fully leverage water assets to create great places to live, work, and play.

Recommendations:

3-1: Emphasize water resources as assets in state, regional, and community planning efforts to provide appropriate, sustainable protection and to fully leverage community-based economic opportunities.

Goal 5: Michigan has a strategic focus on water technology and innovation to grow sustainable water-based economies.

Outcome: Policy, innovative practices, and technologies are developed and adopted to grow sustainable water-based economies.

Recommendations:

5-3: Establish voluntary water efficiency targets for all major water sectors to reduce water use impacts and costs.

5-4: Promote innovative technologies that reduce cost and water loss, or convert waste products to usable materials.

5-5: Develop a water conservation and reuse strategy for the State, local governments, and public and private facilities that incorporates the use of green infrastructure, grey water systems, and energy production that includes recognition programs.

5-6: Fund a pilot project, through a competitive bid process, for the initiation and evaluation of a new model for wastewater management. This pilot program will assess the opportunities and barriers to creating a "Water Resources Utility of the Future," focused on:

- Reclaiming and reusing water
- Extracting and finding commercial uses for nutrients and other constituents
- Capturing waste heat and latent energy in biosolids and liquid streams
- Generating renewable energy using its land and other assets
- Using green infrastructure to manage storm water and improve urban quality of life

5-7: Define measures of agriculture water conservation and establish voluntary targets for utilizing best management practices (BMPs) that reflect conformance with the Irrigation Water Use Generally Accepted Agricultural and Management Practices in areas of existing or potential water stress.

5-8: Enhance voluntary water conservation measures through technology and outreach for agriculture to optimize water use while reducing impacts and costs.

Goal 8: Michigan has integrated outcome-based monitoring systems that support critical water-based decisions.

Outcome: Monitoring systems are in place at a scale and frequency to ensure water quality and quantity are maintained to support diverse uses and values.

Recommendations:

8-1: Develop a coordinated, comprehensive monitoring strategy for groundwater quantity and quality, including a data management system.

8-2: Secure a long-term, sustainable funding source for groundwater and surface water quality and quantity monitoring that is continually improved with new technologies.

8-3: Implement a pilot decision-support framework that includes monitoring, data and information, and analytical tools. This framework will assess ecological, economic, social and cultural values and outcomes at local and regional watershed scales.

Goal 9: Michigan has the governance tools to address water challenges and provide clean water and healthy aquatic ecosystems.

Outcome: Policies, organizational, and institutional structures are in place to achieve goals and outcomes of the Strategy.

Recommendations:

9-3: Uphold the Great Lakes Compact and Agreement by actively participating in the Great Lakes-St. Lawrence River Regional Body and Great Lakes – St. Lawrence River Compact Council including financial support of these entities entrusted to govern the Compact and Agreement.

9-4: State and tribal governments will meet on an ongoing basis to discuss and develop strategies to support management of Michigan's shared water resources. The state and tribal governments will jointly develop agendas reflecting the priorities of all parties involved.

The Water Use Advisory Council Conservation and Efficiency Recommendations are available online at Michigan.gov/waterstrategy under the Development tab.

APPENDIX 2: MICHIGAN WATER CONSERVATION AND EFFICIENCY PROGRAM

Water Conservation and Efficiency Goals and Objectives

Goals

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

1. Utilize Michigan's Water Use Program and Water Withdrawal Assessment Process to guide long-term sustainable water use.
 - a. The programs will be adaptive, goal-based, accountable, and measurable.
 - b. Continue to develop and implement programs openly and collaboratively, with local stakeholders, Tribes and First Nations, governments and the public.
 - c. Prepare and maintain long-term water demand forecasts.
 - d. Develop long-term strategies that incorporate water conservation and efficient water use practices.
 - e. Review and build upon existing planning efforts by considering practices and experiences from other jurisdictions.
2. Adopt and implement supply and demand management to promote efficient use and conservation of water resources.
 - a. Maximize water use efficiency and minimize waste of water.
 - b. Promote appropriate innovative technology for water reuse.
 - c. Conserve and manage existing water supplies to prevent or delay the demand for and development of additional supplies.
 - d. Provide incentives to encourage efficient water use and conservation.

- e. Consider water conservation and efficiency in the review of proposed new or increased uses.
 - f. Promote investment in and maintenance of efficient water infrastructure.
3. Improve monitoring and standardize data reporting among State and Provincial water conservation and efficiency programs.
- a. Improve the measurement and evaluation of water conservation and water use efficiency.
 - b. Encourage measures to monitor, account for, and minimize water loss.
 - c. Track and report program progress and effectiveness.
4. Develop science, technology, and research.
- a. Encourage the identification and sharing of innovative management practices and state of the art technologies.
 - b. Encourage research, development, and implementation of water use and efficiency and water conservation technologies.
 - c. Seek a greater understanding of traditional knowledge and practices of Basin First Nations and Tribes.
 - d. Strengthen scientific understanding of the linkages between water conservation practices and ecological responses.
5. Develop education programs and information sharing for all water users.
- a. Ensure equitable public access to water conservation and efficiency tools and information.
 - b. Inform, educate, and increase awareness regarding water use, conservation, and efficiency and the importance of water.
 - c. Promote the cost-saving aspect of water conservation and efficiency for both short-term and long-term economic sustainability.
 - d. Share conservation and efficiency experiences, including successes and lessons learned across the Basin.
 - e. Enhance and contribute to regional information sharing.

- f. Encourage and increase training opportunities in collaboration with professional or other organizations in order to increase water conservation and efficiency practices and technological applications.
- g. Ensure that conservation programs are transparent and that information is readily available.
- h. Aid in the development and dissemination of sector-based best management practices and results achieved.
- i. Seek opportunities for the sharing of traditional knowledge and practices of Basin First Nations and Tribes.