STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

GRETCHEN WHITMER
GOVERNOR

LANSING

LIESL EICHLER CLARK
DIRECTOR

November 23, 2020

VIA EMAIL

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: 2020 Water Conservation and Efficiency Program Annual Assessment
Submitted on behalf of the state of Michigan

On behalf of the state of Michigan, enclosed is the 2020 Water Conservation and Efficiency Program Annual Assessment being sent pursuant to and in satisfaction of the obligations included in Section 4.2 of the Great Lakes-St. Lawrence River Basin Water Resources Compact. Please note that these reports are subject to revision and update during the Compact Council and Regional Body program review process.

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

Sincerely,

James Clift
Deputy Director

Enclosure
cc: Peter Johnson, Conference of Great Lakes St. Lawrence Governors and Premiers
Liesl Eichler Clark, Director, EGLE
James Milne, EGLE
Emily Finnell, EGLE

GREAT LAKES-ST. LAWRENCE RIVER BASIN WATER RESOURCES COMPACT
WATER CONSERVATION AND EFFICIENCY PROGRAM ANNUAL ASSESSMENT

State of Michigan

November 20, 2020

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 Environment, Great Lakes, and Energy (EGLE) Water Use Program is the lead agency responsible for Michigan's water conservation and efficiency program.

Compact Contact: Mr. James Clift, Deputy Director, Executive Office; 517-284-6871, CliftJ@Michigan.gov.

Program Contact: Mr. James F. Milne, Supervisor, Water Use Assessment Unit, Permits Section, Water Resources Division; 517-285-3253, MilneJ@Michigan.gov.

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

Michigan adopted water conservation and efficiency goals and objectives that are consistent with the Basin-wide goals and objectives. These goals and objectives were developed by the former Water Resources Conservation Advisory Council, a stakeholder forum of executive and legislative appointees that was established for collaborative study, evaluation, and advisement for Michigan's water management and water conservation and efficiency programs. Michigan's water conservation and efficiency goals and objectives continue to be met through the water conservation and efficiency program that was initiated with the adoption of the Compact.

The Water Use Advisory Council (WUAC), established under Part 328, Aquifer Protection, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), continues to play an integral part in Michigan's water management and water conservation and efficiency program, in that it provides a platform for raising water withdrawal related issues and establishes an integrated framework of roles and responsibilities for all stakeholders in managing Michigan's water resources. The WUAC collaboratively studies, evaluates, and provides advice regarding Michigan's water management, conservation, and efficiency programs. It also assists on technical issues, implementation, and monitoring overall progress of Michigan's water use program. The WUAC creates opportunities for the public, university researchers, industry professionals, advocacy groups, and other interested parties to be involved and to work directly with state agencies to set policy and shape

the program's direction. 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.

The WUAC is charged to report biennially to the Michigan Legislature, the Michigan Department of Environment, Great Lakes, and Energy (EGLE), the Michigan Department of Natural Resources (DNR), and the Michigan Department of Agriculture and Rural Development (MDARD). The Council's recommendations have the potential to advance and improve data collection, modeling, research, and refine administration of the water withdrawal assessment process and Michigan's water conservation and efficiency program.

The Council's open and ongoing discussions keep agency program staff 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.

In addition to the WUAC's collective work, over the past 18 months there has been greater focus in Michigan on the impacts of climate change, including high water levels, reducing Michigan's carbon footprint, and addressing ageing water infrastructure. Michigan Governor Gretchen Whitmer recently ordered EGLE's Office of Climate and Energy to coordinate the state's efforts to achieve carbon neutrality by 2050 through development and implementation of the MI Healthy Climate Plan, outlined in Executive Order 2020-182 and Directive 2020-10. The creation of the *MI Healthy Climate Plan*, a comprehensive plan meant to protect public health and the environment while helping to develop new clean energy jobs by making Michigan fully carbon-neutral by 2050 provides an opportunity to bring water squarely into the energy conversation.

In addition, the *MI Clean Water Plan* is investing $500 million in Michigan's ageing water infrastructure. The *MI Clean Water Plan* presents an opportunity to improve drinking and wastewater infrastructure, expand green infrastructure, address water loss through leaky systems, and educate the public about water and energy efficiency and conservation.

Efforts are underway to assess Michigan's new and existing climate, energy, and water infrastructure programs and initiatives to identify opportunities to further advance Michigan's water conservation goals and objectives.

Michigan also continues to implement the 2016 Water Strategy, an all-inclusive vision and blueprint to ensure Michigan's water resources continue to support healthy ecosystems, communities, and economies for current and future generations. Implementation efforts focus on building capacity for shared governance for water and water stewardship.

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.[1] The likely resource impacts of a proposed withdrawal must meet the environmental impact standard and be authorized by EGLE before the withdrawal can begin.[2] If the withdrawal is likely to exceed the environmental impact standards, then an applicant may have an opportunity to seek site specific review. For an LQW to be approved through a site-specific review, water users incorporate water conservation and efficiency measures 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.[3]

Michigan's water conservation and efficiency program goes beyond the assessment process to include a comprehensive program of water use management. This program establishes an integrated framework of roles and responsibilities for private and public water users and governmental agencies in managing Michigan's water resources. Further, this framework creates opportunities for involvement by the public (e.g., local committees and volunteer efforts such as stream monitoring); universities (e.g., research and technical assistance); and other interested parties resulting in a latticework of shared investment in the sustainability of Michigan's lakes, streams, and groundwater.

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.[4] In sub-watersheds that are approaching the environmental impact standard, to have a withdrawal approved, an applicant must implement the water conservation measures they deem to be reasonable.[5] For applications greater than 2 million gallons per day (MGD) capacity, it is required that all sector or withdrawal-based conservation measures are complied with as a condition of approval.

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.	• Regulatory framework that requires resource conservation. • Adaptive programs that integrate new data, methods, and policies in response to changing environmental conditions.

[1] Michigan Compiled Laws (MCL) 324.32705
[2] MCL 324.32706b, 324.32706c, 324.32723
[3] MCL 324.32706e
[4] MCL 324.32707, 324.32708
[5] MCL 324.32706c, 325.1004

II. Adopt and implement supply and demand management to promote efficient use and conservation of water resources.	• 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. • Drinking water infrastructure grants to communities involving water main work, service line replacements, plant enhancements, and other upgrades. • Implementation of a water leak pilot program in the cities of Highland Park and Benton Harbor.
III. Improve monitoring and standardize data reporting within water conservation and efficiency programs.	• Increased water use reporting data quality. • Continuing efforts to bring into compliance previously unreported water uses. • Outreach efforts continue with property owners, well drillers, and other interested parties to increase awareness of Part 327's requirements and increase compliance. • Launched a new database for agricultural water users. • Continue asset management planning initiatives, including a grant program administered by EGLE to further mature local community's asset management programs.
IV. Develop science, technology, and research.	• $1.5 million geological, hydrogeological, and hydrological data collection and analysis regional pilot study. The geologic, groundwater, stream flow, and sediment characterization sample data are being used, when appropriate, as part of evaluation of future LQWs. Privately funded work continues (in collaboration with the WUAC's Models Committee, EGLE, and the United States Geological Survey (USGS) to improve the groundwater model that was one of the products of the Cass County Pilot Study. • $320,000 study completed to document the response of stream flow to high-capacity groundwater pumping and develop groundwater models. Draft report from the study is undergoing USGS internal review process. USGS continues to work on their groundwater model. • Ongoing state/federal glacial geology mapping partnership.

	• More than 80 streamflow measurement locations added in high water use areas. • Increased use of site-specific data and regional withdrawal impact models. • Research to develop an open-source, real-time sensor network in the Clinton River to assess and manage stormwater through hydrologic modeling. • Dedicated funding source for research and innovation through the Michigan Great Lakes Protection Fund.
V. Develop education programs and information sharing for all water users.	• Additional water use data made available online. • Water use data published in media outlets. • Integrated assessments provide on-site, direct assistance services to help businesses and communities to meet their sustainability goals. • Annual agriculture irrigation practices workshops. • Generally Accepted Agricultural and Management Practices for irrigation water use continue to be reviewed and updated on a yearly basis. This assures the most up-to-date standards are in place for agricultural water use at Michigan's farms. • Michigan Water School provided virtual webinar series to educate and train on water management for local appointed and elected officials. • Hosted annual Great Lakes Freshwater week to celebrate water resources and encourage Michigan residents to experience water, become educated about water resources, and take action to become water stewards. • From Students to Stewards Initiative launched to integrate water literacy principles into K-12 school curriculum and build a culture of stewardship, six schools participating in 2020-2021 academic year.

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

Michigan continues to guide programs toward long-term water sustainability through the implementation of its water withdrawal assessment program. Additionally, the WUAC works collaboratively to continuously assess and improve the program based on new science, data, advancements in modeling and new technology. Also, the new state policy initiatives focused on climate, energy, and water infrastructure investments present even greater opportunity to guide programs toward sustainable

water use. Efforts are ongoing by many actors across the state to implement key recommendations in Michigan's Water Strategy, a 30-year roadmap to ensure the viability and sustainability of Michigan's water resources for current and future generations. This long-term strategy was built through a collaborative process that recognizes continued learning, open dialogue, and adaptive management are critical to achieving improved water quality, sustainable groundwater resources, and ensuring proper management of these shared resources.

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 to inform LQW assessment methods and policies to support better decision making and ensure long-term sustainable water use.

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

EGLE 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. 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. The LQW assessment process is designed to be adaptive and able to respond to changing environmental conditions.

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, in part because reporting is voluntary. 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 was increased through a special outreach initiative to identify and bring into compliance previously unreported water uses. Approximately 232 previously unreported large quantity withdrawals were brought

into compliance through this initiative. EGLE compliance staff continue to work on a case-by-case basis with property owners, well drillers, consultants, and other interested parties to bring newly discovered unauthorized LQWs and other violations of Part 327 into compliance.

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. EGLE has prioritized investments in staff and resources to improve its technology and database management. Currently, data have been collected and frequently "compartmentalized" to meet the needs of narrowly defined programs. Therefore, existing data are found in many locations and formats. Typically, the data are housed by categories of surface water (quantity and quality), groundwater (water levels, aquifer properties, and quality), geologic data (stratigraphy), climate data (precipitation, temperature, and evapotranspiration).

The WUAC Data Collection Committee developed recommendations for the biannual report to the legislature for the creation of an Integrated Water Management Database that will increase the effectiveness and efficiency of all water related programs in Michigan by making all these data easily accessible and in a common geospatial format. This effort should include obtaining groundwater data currently only available in paper form (*e.g.*, monitoring well data collected under Part 115, Solid Waste Management; Part 201, Environmental Remediation; or Part 213, Leaking Underground Storage Tanks, of NREPA). Michigan's water programs rely on sophisticated models and technical analyses to accomplish their goals. These all require high quality data, and enough data to adequately define water resources in Michigan to make proper management decisions. The Michigan Hydrologic Framework (MHF), another proposal from the Council, would facilitate the creation of models to support statewide sustainable water management of both surface water and groundwater. The MHF recognizes the critical importance of accessing a wide range of water-related data.

The WUAC recommendations are consistent with Michigan's Water Strategy, which 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. The WUAC new recommendations, in most cases, require Michigan's legislature to appropriate additional funding in order to be implemented.

Other efforts underway to improve data collection include the work of the Michigan Infrastructure Council and the Michigan Water Asset Management Council. Both Councils were created in statute to develop and direct implementation of a statewide strategy to standardize and streamline data collection, storage, and analysis related to infrastructure. EGLE continues to provide financial support for asset management planning for water utilities through grants under its drinking water asset management

program, in addition to providing Stormwater, Asset Management, and Wastewater Program (SAW) grants and technical assistance.

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 is funding several research projects in high water use areas to better understand the groundwater-surface water interaction. 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's Quality of Life Agencies (EGLE, MDARD, and the DNR) have been implementing several key research priorities from the WUAC's December 12, 2014, final report including:

Temperature Logging Sensor Studies: The DNR, Fisheries Division, deploys temperature loggers to study stream temperatures and conducts fish population surveys in Michigan's lakes and streams.

USGS Monitoring Partnerships: EGLE and the USGS have a joint funding agreement for operating stream gages and monitoring wells, as well as collecting miscellaneous stream flow measurements. The USGS also conducted a study of the interactions between high-capacity wells in shallow groundwater and streamflow in nearby streams in two watersheds in the west-central portion of Michigan's Lower Peninsula (their final report is under internal agency review). The WUAC report contains recommendations to Michigan's legislature to provide continued long-term funding for stream gages, miscellaneous flow measurements, and monitoring wells.

Groundwater Modeling Study: The three Quality of Life agencies also partnered with external stakeholders to co-fund a three-year study in Cass County in southwest Michigan. The Cass County study collected geologic, groundwater, and stream data, evaluated multiple methods for field data collection, and developed groundwater models for several sub-watersheds in Cass County. The study ended on October 7, 2019. EGLE and USGS reviewers cited several problems with the construction and calibration of the models, but the geologic, groundwater, stream flow, and sediment characterization sample data will be useful for evaluating future LQWs. Privately funded work continues (in collaboration with the WUAC Models Committee, EGLE, and USGS) to improve the Cass County Study's groundwater model. Each of these monitoring and data collection efforts have been stepped-up and focused in areas of the state where groundwater LQWs are most prevalent to increase understanding of groundwater-surface water interaction, and the effects of groundwater use on stream ecology especially.

Geologic and Groundwater Research: The glacial geology of Michigan is quite complex and varied, and it is one of the major challenges in gaining a better understanding of Michigan's groundwater resources. Research is continually

ongoing by state, federal, and academic institutions. Examples of current research include a joint project with EGLE and the Michigan State University Department of Civil and Environmental Engineering to develop innovative ways of using technology to process and analyze existing information in Michigan's extensive groundwater database. In addition to these data collection and monitoring efforts, the Michigan Geological Survey (MGS) and USGS perform surveys and sample collections to map Michigan's glacial geology in three dimensions on a county-by-county basis. As of October 2020, MGS and USGS completed 21 three-dimensional glacial geology maps and two county bedrock geology maps. Approximately 8% of the glacial geology in Michigan has also been mapped in three dimensions.

EGLE is also supporting research on an innovative, real-time sensor network in the Clinton River. The goal of this work is to develop an open-source technology to assess and manage stormwater through hydrologic modeling that is accessible at a local scale. Dissemination and use of similar sensor networks would increase the availability of real-time data about Great Lakes water conditions and improve the state of knowledge about water quantity and quality.

The Michigan Great Lakes Protection Fund exists as a dedicated funding program to support research to improve scientific understanding of Great Lakes issues. The fund is administered by the Michigan Office of the Great Lakes.

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

Michigan has several new and ongoing outreach and education programs that provide information about water conservation and efficiency and promote water stewardship principles and practices. Efforts are also ongoing to promote water stewardship through effective statewide communication strategies to improve the public's understanding of their impact on water resources and actions and behaviors that support responsible water use.

Presentations, Conferences, Webinars, and Trainings

EGLE and MDARD staff make educational presentations at meetings and various conferences as well as share information upon request, to a variety of interested parties. The WUAC and its subcommittee meetings are open to the public and provide educational opportunities and information sharing for water users and water managers about Michigan's ongoing program implementation. Meeting notes and informational materials from the WUAC proceedings are posted on an EGLE webpage.

EGLE continues to increase public awareness of water use information and access to data by publishing additional water use data online, holding public information meetings, and utilizing various media outlets. In addition, EGLE provides webinars, conferences, training, and information for businesses and industry to support enhanced water conservation and efficiency.

Outreach for Agricultural Irrigators

Michigan State University Extension convenes meetings around the state with agricultural water users to share information about conservation practices for irrigation.

Water Leak Pilot for Water Utilities and Residents

The Office of the Clean Water Public Advocate developed the Focus on Water Initiative, bringing together multi-sector partners to support community efforts and connect resources to address water concerns. The broad initiative includes the Water Leak Pilot. In November, the Office of the Clean Water Public Advocate launched the Water Leak Pilot in partnership with community-based organizations and state and local partners. The program is focused on the communities of Highland Park and Benton Harbor. The program aims to reduce water waste in communities. Water leaks are a financial burden for municipalities and their residents. They can contribute to water quality concerns and are an energy burden for utilities. During the 12-month pilot period, the program will increase community education about water leaks, conducting household water audits, and tips for energy savings. Two hundred residents will receive free premise plumbing repairs. The Office of the Clean Water Public Advocate will continue to engage communities and add additional programs and pilots to the Focus on Water Initiative in 2021.

Michigan Water School

MSU Water Resources Institute, MSU Extension, and Michigan Sea Grant continue to implement the Michigan Water School, which is focused on educating local appointed and elected officials about water management and the impact of their decisions on water resources including water quantity and quality. Because of the Covid-19 pandemic, Michigan Sea Grant and Michigan State University Extension offered a new, online version of the Michigan Water School program for elected and appointed officials and staff to provide decision-makers with critical, relevant information needed to understand Michigan's water resources in order to support sound water management decisions. This year, Michigan Water School: Essential Resources for Local Officials, was offered for free as a webinar series. The program included sessions on water quantity; water quality; water finance and planning; and water policy issues. Topics to be covered include the Blue Economy, fiscal benefits of water management, incorporating water into local planning and placemaking, resources to help address water problems, water policy at the federal, tribal, state, and local levels.

From Students to Stewards Initiative

In January 2020, EGLE launched an initiative to integrate water literacy principles in K-12 school curriculum, in partnership with the Michigan Departments of Labor and Economic Opportunity, Education, and Natural Resources, along with numerous community partners. This effort, called the From Students to Stewards Initiative, is intended to develop a life-long culture of stewardship by integrating Great Lakes and

freshwater literacy principles into standards-based school curricula through place-based, authentic-experience approaches to improve stewardship behavior and provide an engaging context to motivate school performance. This initiative will teach STEM concepts using place-based, problem-based, and project-based approaches with a focus on Great Lakes literacy principles to foster the next generation of water stewards, leaders, skilled workers, and decision makers needed to solve complex water issues in a changing world. The From Students to Stewards Initiative teaches elementary through high school students about the Great Lakes, Michigan watersheds, and the impact people have on water resources across the state. Six Michigan school districts have been chosen as grant recipients of the program to integrate water literacy principles and place-based education into school curricula and their continuous improvement plans. The program includes a toolkit and roadmap that other schools can use to develop their own Great Lakes-based curriculum to cultivate the next generation of water stewards, leaders, and decision makers.

Great Lakes Freshwater Week

Michigan held its annual Great Lakes Freshwater week August 8-16, 2020, to celebrate our water resources and encourage Michigan residents to experience water resources, become educated about water resources, and take action to become water stewards. Watershed organizations, regional and local units of government, and other community partners hosted numerous virtual events to encourage water stewardship.

EGLE Classroom

EGLE is providing a variety of online videos through its new EGLE Classroom initiative that teachers and parents can use to supplement school lessons all year long. EGLE Classroom will help instructors to think about how to talk to their students on ways to interact with the natural world around them. The initiative is intended to be a two-way collaboration and urge teachers and students to create their own videos that can be shared with others across Michigan as a statewide resource. Teachers can record a quick classroom lesson or demonstration, post it to Twitter using the hashtag #EGLEClassroom and tag @MichiganEGLE. EGLE also has updated its EGLE Classroom educational resources webpage with classroom resources from EGLE and its partners to assist students and instructors with information on environmental topics.

Integrated Assessments for Sustainability

EGLE's Pollution Prevention (P2) and Stewardship Unit provides a variety of on-site, direct assistance services to help businesses and communities meet their sustainability goals. Benefits of the integrated assessments include an increase of efficiencies and cost savings, elimination/minimization of waste streams, conservation of energy and water resources, and mitigation of risks and the potential for noncompliance.

EGLE also holds a Sustainability Webinar series promoting sustainability practices targeted toward businesses and industries in the water sector.

Appendix 2 provides a full list of the water conservation and efficiency goals and objectives of Michigan's water conservation and efficiency program.

WATER CONSERVATION AND EFFICIENCY PROGRAM IMPLEMENTATION TIMELINE AND STATUS

All components of Michigan's water conservation and efficiency program have been 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. Additional state funding resources have recently been allocated to bolster program areas of need. From the beginning, it has been recognized that the program would continually adapt based on new science, data, research, advancements in modeling, and technological innovation to improve and enhance sustainable water use. 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.

Michigan is advancing new policies and programs to address climate, energy, and water that will further impact both state and Compact goals. This new focus on climate, energy, and water presents new opportunities to identify specific innovative opportunities to improve Michigan's water conservation and efficiency program by building connections between current and new policies and programs and technological innovations. Michigan will be assessing its current climate, energy, sustainability, and water infrastructure policies and programs to identify current and future opportunities to strategically integrate water conservation and efficiency into future efforts to ensure users have the best available information, tools, and technologies to engage in activities to improve efficiency and conservation of water resources and ensure sustainable water resources. In addition, new state policies and offices focused on environmental justice and clean water advocacy are improving state program administration and outreach and engagement efforts to address goals of equity, diversity, and inclusion.

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 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 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.