

Recommendations Matrix from the December 12, 2014, Final Report of The Water Use Advisory Council (WUAC)

Number	Recommendation (Per the December 12, 2014, Final Report)	Implementation Complete? (Y/N)	Comments (Including implementation status as of 7/22/2019)
	The Director of the DEQ should reestablish and maintain the WUAC, or a similar stakeholder group, for the foreseeable future in order to provide input on issues related to the implementation of Part 327, P.A. 451.	Y	WUAC, Version 3.0, now codified in Part 328, Aquifer Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). First meeting of the newly reconstituted WUAC is July 22, 2019.
TU 1.1	As quickly as possible, the Program should partner with Michigan NHD Steward to edit the NHDH, attributing all segments as intermittent that are symbolized as intermittent on the most current version of the 1:24,000 topographic maps.	N	Scope of work received, and funding allocated for a pilot project to edit the 1:24,000 National Hydrograph Dataset (NHDH) stream layer.
TU 1.2	As soon as an edited version of the NHDH is available, the DEQ should eliminate all intermittent segments and adopt this revised file as the hydrography used by the Program in both the WWAT and during site specific reviews.	N	The pilot project to edit the 1:24,000 NHDH stream layer will include recommendations on whether and how to implement the editing process regionally or statewide.
TU 1.3	Recognizing that such an effort could be lengthy, the Council recommends that the DEQ use a phased approach by giving first priority to those regions of the State where the majority of the current water withdrawal registrations have occurred.	N	The pilot project to edit the 1:24,000 NHDH stream layer will include recommendations on whether and how to implement the editing process regionally or statewide.
TU 1.3a	Prioritize regions for updating stream linework to 1:24,000 and truncating intermittent stream reaches.	N	The pilot project to edit the 1:24,000 NHDH stream layer will include recommendations on whether and how to implement the editing process regionally or statewide.
TU 1.3b	Phased implementation of updating stream linework & truncating intermittent stream reaches.	N	The pilot project to edit the 1:24,000 NHDH stream layer will include recommendations on whether and how to implement the editing process regionally or statewide.
TU 2.1	Modify the WWAT's coding to use the top of bedrock depth from the WWAT's glacial thickness map GIS data layer at the proposed well location instead of using an average top of bedrock depth for the Watershed Management Area.	N	Top of bedrock depth should be in the Groundwater Inventory Mapping (GWIM) data set as glacial thickness. The Water Withdrawal Assessment Tool (WWAT) needs to be recoded to use the glacial thickness value as top of bedrock in areas that were formerly subject to the bedrock pass.
TU 2.3	Permanently discontinue use of the "Bedrock Auto Pass" feature.	Y	Driller provides the Department of Environment, Great Lakes, and Energy (EGLE), [formerly the Department of Environmental Quality (DEQ)] with field notes justifying EGLE issuing a "geology pass" authorization (i.e., aquifer hydraulically separated from surface water).
TU 2.3a	WWAT uses glacial aquifer characteristics in areas where bedrock aquifer properties aren't available for proposed bedrock wells. DEQ uses bedrock aquifer characteristics in any site specific reviews in these areas.	Y	WWAT uses bedrock aquifer characteristics, when available in the GWIM data for water management areas (WMAs), otherwise it uses glacial aquifer characteristics. EGLE has "batch tool" versions of the Hunt 1999, Hunt 2003, and Ward & Lough 2011 models to estimate stream flow depletions for large quantity withdrawals (LQWs) authorized using the "bedrock auto pass" feature using bedrock aquifer properties (if available) or glacial aquifer properties.
TU 2.3b	Bedrock aquifer characteristics GIS data layer is made available throughout Michigan. WWAT is modified to use the bedrock aquifer characteristics for proposed bedrock wells.	N	WWAT uses bedrock aquifer characteristics, when available in the GWIM data for WMAs, otherwise it uses glacial aquifer characteristics.
TU 2.2	Make the WWAT registration number a required field in Wellogic (and on paper well logs) for high-capacity wells.	N	Collaboration necessary with EGLE, Drinking Water and Environmental Health Division (DWEHD) and Michigan Ground Water Association (well drillers).
TU 3.1	The process for checking the compliance of "as built" well construction details with WWAT and/or SSR registrations of groundwater LQWs should be automated. Discrepancies between these should be flagged for follow up by staff.	N	Compliance review process isn't automated. EGLE staff has geographic information system (GIS) data layers for, and compares, well logs, LQW registrations, and water use reporting data to determine compliance with Part 327 of the NREPA.

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TU 3.2	The DEQ should work with stakeholders to increase the understanding of Part 327 requirements for owners of newly constructed large capacity wells and increase compliance with the requirement to report differences between registered and "as built" well characteristics.	N	EGLE collaborating with Farm Bureau, Michigan Ground Water Association (well drillers), MSU Extension, and other stakeholders to increase compliance with this notification requirement.
EM 1.2	We recommend the DEQ invest resources to reasonably ensure continuous progress towards filling streamflow measurement data gaps.	N	Joint funding agreements with USGS to install and operate several stream gages and to collect miscellaneous stream flow measurements at other locations to support the Water Use Program.
EM 1.1	To ensure prevention of adverse resource impacts, and to reduce potential for water user conflicts, the DEQ should prioritize and invest resources to ensure prompt, adequate and strategic acquisition of stream flow data in high water withdrawal areas or areas of potential conflict.	N	Doing this now although continued stakeholder input is welcome.
TU 4.1	DEQ should write up the procedures and criteria used to modify index flows. The procedures and criteria should be reviewed by the Council, or similar stakeholder group, before adoption by the Department.	Y	EGLE, Water Resources Division (WRD) Policy and Procedure WRD-049, Index Flow (50 Percent Exceedance Flow) Determination, finalized January 15, 2019. Available on WRD's web page.
EM 1.3	Protocols and standards for the collection and use of stream flow data for use in this program should be developed by the DEQ, approved by the WUAC and approved through the appropriate statutory process, and clearly published on its website.	N	MCL 324.32706d requires that stream flow data meet the USGS' data quality standards, which are available on the USGS web site.
EM 1.5	DEQ should develop a program for streamflow data collection by non-agency persons. This program should provide data collection procedures and guidance, explanation of how the data can be used, provide for training opportunities, and provide for the collection, storage and accessibility of the data collected.	N	Michigan Clean Water Corps (MiCorps) developed a pilot project in 2016 for volunteer stream flow monitoring project procedures. Continued MiCorps funding uncertain. 3 rd party stream flow monitoring data needs to meet the USGS' data quality standards.
TU 4.2	DNR should write up the procedures and criteria used to modify stream classification. The procedures and criteria should be reviewed by the Council, or similar stakeholder group, before adoption by the Department.	N	Department of Natural Resources (DNR) Fisheries' draft policies and procedures on Stream Classification and Redesignation and Stream Thermal Data are ready for review by the WUAC.
TU 4.3	DEQ/DNR should use Table TU-1 as a guide to determine what level of approval is needed to make modifications within the Water Withdrawal Assessment Process.	Y	DNR and EGLE use Table TU-1 as a guide in determining the appropriate levels of approval for modifications in the Water Withdrawal Assessment Process.
TU 5.1	Continue to use the index flow estimation model for the initial values in the WWAT that are then modified by SSRs.	Y	No action necessary.
TU 5.2	Continue to use the current analytical solution (Hunt, 1999) in the WWAT to compute streamflow depletion.	Y	No action necessary
EM 1.7	We recommend that an overall statistical update of all index flows is not yet necessary. The need to perform this statistical update should be reviewed by DEQ at least every 5 years.	N	The current WUAC should recommend to EGLE whether there is a need to perform an overall statistical update of all index flows.

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TU 6.1	Work with stakeholders to develop criteria describing site specific data analyses to estimate potential streamflow depletion by a new well. The criteria should specify desired quality assurance and quality control processes for the program.	N	The Cass County Pilot Study (to be completed by November 2019) and the USGS' study in the Wolf Creek and Skunk Creek watersheds (in their internal agency review process) will partially address this recommendation. Nestle's data for their Mecosta and Osceola County withdrawals may also provide some information. EGLE's Water Use Assessment Unit (WUAU) developing an aquifer pumping test guidance document that will be shared with the WUAC for its input.
EM 2.2	The State should publish its protocols and standards for the collection and use of groundwater data and glacial geology on its public websites.	N	The Info Guide for LQW is on the Water Use web page. Aquifer pumping test guidance will be shared with the WUAC for its comments after revisions.
EM 1.6	The DEQ and DNR should invest in the strategic acquisition of research and/or monitoring to assess the real-world impacts of large-quantity water withdrawals.	N	The Cass County Pilot Study (to be completed by November 2019) and the USGS' study in the Wolf Creek and Skunk Creek watersheds (in their internal agency review process) will partially address this recommendation. Nestle's stream flow and stream temperature data may also be of use.
TU 7.1	Work with stakeholders to develop criteria describing the required features of groundwater-flow models to be used in the water-withdrawal assessment process focusing on streamflow depletion.	N	Cass County pilot study (due by November 2019) will include groundwater models. USGS' study in the Wolf Creek and Skunk Creek watersheds will also include developing a groundwater model.
EM 1.4	When DEQ receives or acquires data of the quality and standards that would prompt the Department to change a Tool parameter for a Watershed Management Area, DEQ should not wait until a registration request triggers an SSR in that Watershed Management Area. The DEQ should incorporate that new data and make any appropriate changes at least bi-annually.	N	Revised index flow values are used by the WWAT, SSR, and alternative analyses under Section 32706c. Revised aquifer properties are available for use by SSRs and alternative analyses but don't get incorporated into the WWAT.
EM 2.1	We recommend a database be created to gather and collate data on glacial geology, static water levels and aquifer characteristics collected by state and federal agencies as well as by universities and private industry. It should utilize a common set of accepted geologic and hydrogeologic terms and fields. Organizations or agencies collecting this data should have the ability to submit information to be entered into the database, and the data submitted shall conform to State program requirements. This database should be publicly viewable.	N	Hydrologic framework presentation made to WUAC, Version 2.0. Funding allocated by EGLE, WRD for initial phase.
EM 2.5	The DEQ should continue to collaborate with Michigan Geological Survey and water well drillers on new tools and training programs being developed to improve geologic data entered into Wellogic records and should make necessary changes to Wellogic forms to facilitate the entry of more accurate geologic data into Wellogic.	N	EGLE collaborating with the Michigan Geology Survey (MGS), which held two workshops for licensed well drillers.
EM 2.3	The DEQ should prioritize and invest resources to ensure prompt, adequate and strategic acquisition of groundwater data in areas receiving or anticipated to receive high levels of water withdrawal registrations.	N	The Cass County Pilot Study (to be completed by November 2019) and the USGS' study in the Wolf Creek and Skunk Creek watersheds (in their internal agency review process) will partially address this recommendation.

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EM 2.4	The DEQ should use high quality data it receives, acquires, or collates from the data submitted to the groundwater database and integrate that data into the SSRs, develop numerical models to better understand the hydrogeology of certain areas, and develop better tools to predict streamflow depletion in those areas. Collection of this data and using updated models can ultimately inform and upgrade the screening tool once sufficient data is collected for the associated Watershed Management Areas.	N	EGLE, WRD created "batch tool" versions of the Hunt 1999, Hunt 2003, and Ward & Lough 2011 groundwater models for use in SSRs and alternative analyses under Section 32706c. The groundwater models created for the Cass County Pilot Study and the USGS' Skunk Creek and Wolf Creek study will partially address this recommendation.
WU 1.1	DEQ should establish a process, in advance of any efforts to comprehensively identify large quantity water users, for adding into the formal list of registered and permitted users those noncompliant large quantity users who were making large quantity withdrawals prior to 2006. This process should not include a debiting of the water accounting system for the pre-2006 withdrawals.	N	EGLE, WRD wrapping up the Unreported LQW Initiative for LQWs in operation prior to October 1, 2008. LQWs that are accepted under this initiative are treated as baseline capacity and their depletions aren't counted in EGLE's cumulative stream flow depletion tracking. As of July 22, 2019, 161 previously unreported LQWs were identified and accepted as being eligible to be treated as baseline capacity through the Unreported LQW Initiative. Another two LQWs, which were ineligible for the initiative were brought into compliance with Part 327 by registering them as new LQWs.
WU 1.2	DEQ should establish a process, in advance of any efforts to comprehensively identify large quantity water users, for adding noncompliant large quantity users who have initiated withdrawal since February 28, 2006, without going through the required screening process into the formal list of registered and permitted users. Designing this process will require careful consideration of whether a distinction should be made between those withdrawals initiated prior to October 1, 2008, and those initiated after that date with respect to any decision to require the formal application and screening process to be undertaken by these users.	N	The Unreported LQW Initiative included LQWs that were in operation by October 1, 2008. New or increased LQWs in operation after October 1, 2008 are subject to the registration requirements in Part 327. EGLE resolves Part 327 violations for unreported LQWs that were installed after October 1, 2008 by issuing after-the-fact registrations if there is enough stream flow available in the affected water management areas to authorize the LQWs. If there isn't enough stream flow available to authorize these unreported LQWs, then they are referred to the WUAU's compliance staff who attempt to bring them into compliance with Part 327. As of July 22, 2019, 161 previously unreported LQWs were identified and accepted as being eligible to be treated as baseline capacity through the Unreported LQW Initiative. Another two LQWs, which were ineligible for the initiative were brought into compliance with Part 327 by registering them as new LQWs.
WU 2.1	DEQ should invest resources to produce and maintain an online set of resources (as described in Table WU-2) resource to provide technical, organizational and financial information to water users groups to support the formation and functioning of Water Resources Assessment and Education Committees (WRAECs) and Water Users Committees (WUCs).	N	No progress by EGLE. Michigan Department of Agricultural and Rural Development (MDARD)?
WU 2.2	DEQ should invest resources to produce a brochure that explains the role of WUCs in Michigan's Water Use Program. The brochure would describe the conditions under which the input from a WUC might be needed, benefits to water users of being part of a WUC, and benefits of creating a WUC before a Zone D request is made or an ARI is observed.	H	No progress
WU 2.3	DEQ should enclose a copy of the brochure in letters sent to all registered and permitted users and associated local governments when a Zone C (or Zone B for a cold transitional stream) withdrawal is approved after a site specific review and in letters that are mailed to all registered and permitted users and associated local governments when a negative SSR occurs.	N	No progress

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WU 2.5	DEQ should develop a protocol to be used for the initial convening of WUCs. The protocol should include the specific tasks the DEQ will undertake at the first WUC meeting.	N	No progress implementing this recommendation. To date, no WUCs have been formed.
WU 4.1	Financial commitment should be made to support the facilitation of water user group negotiations.	N	No progress due to budget and staffing limitations.
WU 4.2	Financial resources should be committed to fund a position which would provide technical assistance to WUCs and DEQ, serve as liaison between the WUC and DEQ, and assist with the analysis (including analysis of the expected impacts of alternative scenarios that the WUC might consider).	N	No progress due to budget and staffing limitations.
WU 2.4	We recommend that DEQ undertake the initial convening of a WUC in two scenarios: a) if a recipient of a negative SSR requests help with contacting and convening large quantity water users within the catchment of concern, and b) if an ARI is suspected.	N	No progress. To date, EGLE has not received any requests to convene a WUC in advance of an adverse resource impact (ARI) being suspected. To date, EGLE has not had to convene a WUC because an ARI is suspected.
WU 3.1	At the request of a WUC (registered and permitted water users in a watershed), the DEQ and MDARD should be prepared to share with the WUC the following information: <ul style="list-style-type: none"> • Contact information for all registered and permitted water users in the watershed • The cumulative withdrawals in the watershed • The legally available amount of streamflow depletion for the watershed. 	N	No progress. To date, no WUC have been formed. Freedom of Information Act exemptions may prevent sharing some water use information with water user groups.
WC 1.1	Michigan should improve its water use-related data management program. In particular, each water user should design the appropriate data sets in order to track water use, progress on water efficiency and conservation, and develop demand analysis. Development of these data sets must balance the need to be generally applicable to a sector or sub-sector and the ability to be tracked over time with the complexities of the circumstances faced by each particular user. The state-specific outcomes described in Recommendation WC 5.1 can inform the development of these data sets. Ideally, these data sets could be recommended for Great Lakes Basin-wide use.	N	No progress
WC 1.1a	Improve the quality of current water use reporting.	N	No progress
WU 1.3	DEQ and MDARD should partner to develop and maintain a system for cross-checking annual water use reports against lists of registered and permitted users to monitor compliance with water use reporting requirements.	N	MDARD already shares its water use reporting data with EGLE as part of the regional water use reporting under the Great Lakes Compact.
WC 1.1b	Improve the capacity to track water usage.	N	As of July 22, 2019, 161 previously unreported LQWs were identified and accepted as being eligible to be treated as baseline capacity through the Unreported LQW Initiative. Another two LQWs, which were ineligible for the initiative were brought into compliance with Part 327 by registering them as new LQWs.
WC 1.1d	Develop water demand analyses for individual water use sectors.	N	No progress

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WC 1.1c	Assess the results of water conservation & efficiency measures.	N	No progress
WC 1.2	Based on the water use trends, more focus needs to be placed on conservation and efficiency in the Irrigation Sector. MDARD has developed comprehensive guidance in the form of Generally Accepted Agricultural and Management Practices (GAAMPs), which includes guidance in preparing a water conservation and efficiency plan. MDARD and Michigan State University (MSU) Cooperative Extension should continue to provide and expand training and outreach to the Irrigation Sector to increase the use of these GAAMPs.	N	MDARD rolled out a new database in 2018 to better track implementation of best management practices. MDARD has continued to expand staffing for the local Michigan Agricultural Environmental Assistance Program (MAEAP), which helps farmers implement voluntary measures to protect water quality. MDARD has also continued to implement new incentives to expand MAEAP participation and support long-term practice implementation.
WC 1.4	Michigan should also enhance programs to address the supply side of the water equation. For example, the DEQ should continue and expand programs to support development of green infrastructure and review rules and regulations associated with the beneficial reuse of wastewater/process water/storm water to promote more development in this area.	N	Michigan's Revolving Loan Program has recently completed a Lean Process Improvement and plans to make changes to the way it evaluates applications, including assigning priority points to applications that include sustainability, efficiency, innovation, green infrastructure, water utility of the future concepts, resiliency, and reliability. In 2018, four Michigan water utilities were recognized as leaders and innovators by the EPA's Utility of the Future Today Program (Benton Harbor-St. Joseph, Grandville, Detroit, Great Lakes Water Authority) Genesee County District and Delhi Township became the first communities to receive the Premier Utility Management Performance (PUMP) Award as part of the Michigan Water Environment Association's newly finalized recognition program for Water Resource Recovery Facilities. EGLE hosted the first Great Lakes Green Infrastructure Conference in Detroit in 2017 to bring professionals together to learn and discuss the benefits of using green infrastructure.
WC 2.1	The DEQ should undertake a process to update the current generic and sector-specific conservation measures. This process should include direct involvement by multi-interest stakeholder groups and broader public involvement.	N	No progress
WC 5.3	Response to Comment: Michigan should include current users in programs encouraging adoption of water conservation measures.	N	No progress
WC 2.3	Michigan should improve the administration of its current water conservation requirements. Specifically, the DEQ and MDARD should evaluate the efficacy of current requirements that farms submit conservation plans (if reporting usage to MDARD) and new registrants in Zone C self-certify compliance with generic or sector-specific conservation measures. The efficacy of these requirements should be considered with reference to the current lack of agency follow-up, the potential for and outcomes of actual enforcement of those requirements, and the opportunities provided by the incentive-based program described above.	N	EGLE, WRD, WUAU compliance staff send compliance communications to property owners who haven't submitted their voluntary self-certifications of compliance with water conservation measures as part of their annual water use reporting or in response to receiving a Zone C SSR authorization.

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WC 2.2	Michigan should revise its water conservation program to: 1) further inform and encourage water conservation, and 2) assess and document the nature and extent of water conservation practiced by large water users. This program should consist of the following components:	(see below)	
WC 2.2a	Michigan should convene a multi-interest workgroup to identify existing and new opportunities to incentivize water conservation. This effort should target all water users and encourage conservation generally, the adoption of specific practices, and contribution to improved data collection.	N	No progress
WC 1.3	The DEQ should incentivize water conservation and efficiency in the public sector by rewarding the implementation of water conservation and efficiency measures when applying for State funding for water infrastructure projects. This could be accomplished by providing significant points to project plans from water systems that already have a water conservation and efficiency plan, thereby increasing the likelihood that the project will be funded.	N	Michigan's Revolving Loan Program has recently completed a Lean Process Improvement and plans to make changes to the way it evaluates applications, including assigning priority points to applications that include sustainability, efficiency, innovation, green infrastructure, water utility of the future concepts, resiliency, and reliability.
WC 2.2b	Among the specific practices encouraged should be a water auditing program. For public supplies, the water audit should be in conformance with the American Water Works Association (AWWA), M36 Water Audits and Loss Control Programs. Water users should be encouraged to develop a water conservation program based on the results of the audit. While each water user is able to determine the nature and extent of its conservation program, incentives should specifically encourage a component on metrics for evaluating the performance of the program and reporting of results to the DEQ or MDARD. Providing information to employees or water customers on the water user's conservation programs and policies should also be encouraged.	N	No progress
WC 2.2c	To facilitate the above set of activities, the DEQ and MDARD should develop, or arrange for the development of, templates for water audits and conservation plans. These instruments should be considered by the multi-interest group.	N	No progress
WC 2.2d	The multi-interest workgroup should also be charged with developing a process for evaluating the results of the incentive-based system. This process should include metrics and data collection and evaluation methodologies. Ideally, metrics should be based on outcomes (e.g., volume of water conserved) rather than outputs (e.g., number of conservation practices adopted).	N	No progress

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WC 3.1	The Alliance for Water Efficiency Scorecard provides some valuable information on different tools available for addressing water efficiency and conservation in the municipal sector. However, it is not a good metric to evaluate Michigan's Water Use Program overall or the municipal sector of Michigan's Water Use Program in particular. The workgroup does not recommend its use as a metric.	N/A	No action needed.
WC 3.2	Michigan should develop Water Use Program metrics based on state-specific Water Conservation Program Goals and Objectives, which are recommended for development in Recommendation WC 5.1.	N	No progress
WC 3.3	Beyond metrics based on state-specific goals and objectives, Michigan should encourage the development of regional metrics tied to the Regional Goals and Objectives developed by the Great Lakes Compact Commission.	N	No progress
WC 5.1	Response to Comment: Michigan should adopt state-specific goals and objectives for its Water Conservation and Efficiency Program.	Unsure	Adopted in 2010?
WC 4.1	Michigan should coordinate a statewide campaign and marketing effort to encourage water conservation action, or wise water use, across water use sectors and among individuals.	N	No dedicated education program or campaign has been developed for the state. Various efforts to promote stewardship are ongoing.
WC 4.2	Michigan should invest in hiring a marketing firm to conduct the necessary research to develop a common theme (similar to "Pure Michigan") and consistent message appropriate to target audiences upon which sectors can build actionable messages appropriate to their client base/members.	N	No progress
WC 4.3	Michigan should tap into and partner with successful local sector and non-profit campaigns for examples of creative and effective messaging regarding responsible water use.	N	<p>In 2017-2018, EGLE worked with Cranbrook Science Institute and other partners to bring the Smithsonian travelling Water/ways exhibit to several communities in Michigan. The exhibit provided information about Great Lakes history and culture and acted as a mechanism to collect people's water stories and understand how the people of Michigan value water.</p> <p>Efforts are underway to extend and expand this program, to use the data collected to develop a set of value-based messages and tools to help the state communicate with diverse stakeholders in terms that matter to them.</p>
WC 5.2	Response to Comment: Michigan should be doing more to manage water resources on the basis of long-term sustainability, including consideration of climate change.	N/A	
WC 6.1	This report contains a variety of recommendations for updating Michigan's water conservation program. When the program has been updated, a periodic evaluation of the program must take place to ensure its effectiveness and plan for improvement.	N/A	

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WC 6.2	A full program assessment and update should take place every five years, using data compiled from measurable objectives that have been established for each of the program components. This data should be gathered on an annual basis where applicable.	N/A	EGLE conducts a five-year program review for the Great Lakes Compact in addition to annual reports.
WC 7.1	Pursuant to the terms of the Tribal State Water Accord, Michigan should consult twice yearly with the Tribal Governments in the state to share respective progress on individual and joint efforts to manage Michigan's water resources in furtherance of shared interests in protecting and preserving the Great Lakes basin waters. The discussion should specifically address the coordination of Michigan's accounting-based water management program and tribal water management programs.	N	No progress
IL 1.1	DEQ should review, and work with DNR, on the development of protocols and procedures for collecting bathymetric data so that data collected under these standards can be used to develop inland lake and pond maps that include information about lake and pond depth and volume. The Departments should publish and make available to the public these protocols and standards so that non-agency persons can participate in bathymetric data collection for inland lakes and ponds.	N	Scope of work received, and funding allocated for a pilot project to conduct inland lake bathymetry mapping. The pilot project will use a bathymetry mapping protocol developed by DNR Fisheries Division.
IL 1.2	DEQ should develop training modules through such means as its existing MiCorps program and crowd hydrology projects to encourage citizen participation in lake and pond water level data collection, and ensure that data collection is conducted according to protocols agreed upon by DNR and DEQ for both documenting changes in water levels over time as well as to create bathymetric maps from which mean depth and hypsographic curves can be derived.	N	No progress
IL 3.1	A collaborative effort should be made to utilize public and private funds to install staff gauges in inland lakes and ponds in Michigan. Recognizing that some private groups may want to have staff gauges installed in lakes of interest to them, the staff gauges should be installed first in those inland lakes that are at high and medium risk for ARIs. We recommend using the decision tree in Appendix C as an initial predictive tool for identifying the relative ARI risk for inland lakes and ponds. The staff gauges should be tied into upland elevation benchmarks. The staff gauge elevations should be annually resurveyed due to the potential for damage from ice and other factors.	N	No progress
IL 2.1	The ARI definition for inland lakes and ponds in MCL 324.32701 (1) (a) (vii) does not need to be amended at this time. Inland lakes and ponds may need protection to prevent ARIs from indirect (groundwater) withdrawals, as well as	N/A	No action necessary.

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	<p>direct withdrawals. However, our knowledge of interactions between groundwater and surface water of inland lakes and ponds is insufficient to develop a statewide assessment procedure to efficiently and reliably screen lakes for the potential for an ARI caused by a given withdrawal proposal. Data and further research are needed to support an agency determination of an ARI for lakes and ponds potentially affected by LQWs. Once a screening procedure is established and validated, statutory changes may be made to Part 327 to protect inland lakes and ponds from both direct and indirect withdrawals. An ARI determination should include the recognized and legally protected uses of lakes and ponds.</p>		
IL 2.2	<p>The State of Michigan's Quality of Life agencies (DEQ, DNR, and MDARD), in collaboration with the United States Geological Survey (USGS), should work with the successor to the current Water Use Advisory Council to:</p>	N	See below
IL 2.2a	<p>Prioritize additional data collection and research to better characterize and classify inland lakes and ponds in Michigan with respect to their vulnerability to ARIs caused by groundwater and surface water LQWs.</p>	N	Scope of work received, and funding allocated for a pilot project to conduct inland lake bathymetry mapping.
IL 2.2b	<p>Develop an on-line screening tool capable of assessing whether a proposed surface or groundwater withdrawal is likely to cause an ARI in an inland lake or pond; allow the water user to register LQWs that pass the screening tool; and require a SSR by the DEQ for any proposed LQWs that cannot be passed by the screening tool.</p>	N	No progress
IL 2.2c	<p>Develop a SSR procedure for the DEQ to determine whether a proposed surface or groundwater LQW is likely to cause an ARI in an inland lake or pond. The procedure should be publicly available on the DEQ's website.</p>	N	No progress