

Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance

Asset Management Guidance for Submission to the Department of Environmental Quality
August 2017

Water systems are responsible for managing the infrastructure that pumps, treats, stores, and delivers potable water to their customers. Managing these assets should include a program to identify and address the deficiencies and deterioration that threaten the ability of the system to provide a safe and reliable supply of water. Many utilities are dealing with long neglected infrastructure, and asset management is a tool utilities can use to decide where best to allocate resources to restore, maintain, and improve the water system. Even those utilities that have not neglected their infrastructure will benefit from utilizing asset management to operate their utility in the most cost-effective manner.

This document is intended to provide clarification on the requirements for submission of asset management programs (AMP) to the Michigan Department of Environmental Quality (MDEQ). Other guidance documents are available that provide detailed information on how to develop and implement an AMP. Two such guidance documents have been produced by the MDEQ and the United States Environmental Protection Agency (USEPA):

The [MDEQ guidance document](http://www.michigan.gov/documents/deq/deq-ess-mfs-formsguidance-DWassetmngmntguide_426744_7.pdf) (http://www.michigan.gov/documents/deq/deq-ess-mfs-formsguidance-DWassetmngmntguide_426744_7.pdf) was initially produced for water supplies seeking funding through the Revolving Loan Program, but applies here just the same.

The USEPA has a presentation titled [Asset Management 101](https://www.epa.gov/sites/production/files/2015-10/documents/assetmgt101.pdf) (<https://www.epa.gov/sites/production/files/2015-10/documents/assetmgt101.pdf>) that serves as a good resource for basic information on asset management and guidance on setting up a functional AMP.

Water supplies will submit documentation to the MDEQ that will provide an overview of the AMP and describe the asset management efforts being implemented by the water system. It will likely not contain all of the information gathered for the implementation of the AMP.

Michigan's Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), defines an AMP as, "a program that identifies the desired level of service at the lowest life cycle cost for rehabilitating, repairing, or replacing the assets associated with the waterworks system." The requirements for an AMP are outlined in Rule 1606 of the Administrative Rules of Act 399. The level of detail necessary for each component of the AMP will depend on the needs of the individual water supply. The intent of these requirements is to allow some flexibility so that the AMP can be tailored to provide the most useful tool to the water supply.

An excerpt of Rule 1606, Act 399, is provided below:

R 325.11606 Community water supplies; additional general plan requirements; asset management program; capital improvements plan.

Rule 1606. (1) A community water supply that serves more than 1,000 people shall implement an asset management program as defined in R 325.10102 beginning January 1, 2018, unless otherwise required in this subrule. Supplies may use the reference guide for asset management tools, May 2014, prepared by the U.S. Environmental Protection Agency and listed in R 325.10113 when developing an asset management program. Supplies shall include in the general plan each of the following:

(a) A summary detailing the system used to maintain an inventory of assets. Priority shall be given to an inventory of source, treatment, pumping, and distribution system assets.

(b) A summary describing the method used to assess the criticality of assets considering the likelihood and consequence of failure.

(c) A statement of level of service goals.

(d) A capital improvements plan that identifies waterworks system needs for 5-year and 20-year planning periods. A publicly owned or operated supply shall comply beginning January 1, 2016. A privately owned supply shall comply beginning January 1, 2018.

(e) A summary detailing the funding structure and rate methodology that provides sufficient resources to implement the asset management program.

(2) A community water supply that serves 1,000 or fewer people and that is publicly owned or operated shall include in the general plan a capital improvements plan that identifies waterworks system needs for 5-year and 20-year planning periods. A supply shall comply beginning January 1, 2016.

(3) A community water supply may include additional information with the general plan, including the current reliability study, annual pumpage report, sample siting plan, source water protection plan, water conservation/efficiency program, waterworks operation and maintenance programs, regional planning documents, and relevant zoning and land use plans for the service area.

History: 2009 AACs; 2015 AACs.

As stated above, all community water supplies serving more than 1,000 people are required to have an AMP by January 1, 2018.

Each requirement of the AMP is restated below with additional information to provide a general idea of what is expected; however, the individual water systems will choose how the requirements will be met to best serve their customers.

- a) *A summary detailing the system used to maintain an inventory of assets. Priority shall be given to an inventory of source, treatment, pumping, and distribution system assets.*

An inventory of assets is the first critical piece of any AMP. Each system must decide what information to collect and how to store and manage the data. Some systems will utilize custom software packages built specifically for this purpose, others can use the USEPA's [CUPSS](https://www.epa.gov/dwcapacity/information-check-program-small-systems-cupss-asset-management-tool) tool (<https://www.epa.gov/dwcapacity/information-check-program-small-systems-cupss-asset-management-tool>), and smaller systems may be able to use the [spreadsheet based workbook](http://www.michigan.gov/documents/deq/deq-ess-mfs-formsguidance-am-dw_426762_7.xls) (http://www.michigan.gov/documents/deq/deq-ess-mfs-formsguidance-am-dw_426762_7.xls) provided on the MDEQ website. A basic inventory should consist of a list of assets, their age, condition, useful life, and replacement cost. Other parameters may be useful to add, but this is the minimum information necessary to construct a functional AMP. Any gaps in the data should be identified, along with a plan on how the water system will address those gaps moving forward.

The submission to the MDEQ requires a description of which assets the water system has chosen to include, which parameters the system has chosen to track, and how each parameter has been assessed.

- b) *A summary describing the method used to assess the criticality of assets considering the likelihood and consequence of failure.*

A process must be developed to assess each asset for its likelihood of failure and the consequences associated with that failure. Commonly, assets are scored numerically for both the likelihood and the consequence of failure. The results are then used to calculate the risk factor or criticality score, which help rank the projects in the capital improvements plan (CIP). The scores for the likelihood of failure could depend on a number of factors, including: expected useful life, current condition, and anticipated stress. Similarly, factors for the consequences of failure might include public health, property damage, lost revenue, and social/environmental costs.

The submission to the MDEQ must describe the methodology used to assess the criticality of each asset and prioritize the water supply's needs, including the likelihood and consequences of their failure.

- c) *A statement of level of service goals.*

Each water system must choose the level of service it wants to provide to its customers and plan to sustain that level of service. Many factors will play into that discussion, including: compliance with regulations, additional public health goals, aesthetics, reliability, rates, etc.

Customers in two different communities may have different priorities and expectations, and the level of service goals should reflect that.

Some examples have been provided below:

- Meet all federal and state drinking water standards.
- Maintain pressures between X psi and Y psi.
- Limit water system disruptions to X hours.
- Limit non-revenue water to less than X percent.
- Maintaining the average water bill at less than X percent of the community's median household income.
- Replace all lead service lines by 20XX.

The submission to the MDEQ must state the level of service goals adopted by the water system. A description of the process used to develop the goals, as well as the method to measure and track the goals should also be included.

- d) *A capital improvements plan that identifies waterworks system needs for 5-year and 20-year planning periods. A publicly owned or operated supply shall comply beginning January 1, 2016. A privately owned supply shall comply beginning January 1, 2018.*

The CIP is the product of the combined efforts outlined above. Projects to replace or improve deteriorated assets should be identified once all of the assets are identified and assessed, the level of service goals are determined, and each asset is weighted for criticality. Projects described in the CIP should include a projected cost, anticipated completion date, and funding source. The CIP should go through a formal approval process by the water system's leadership to ensure all parties are aware of and familiar with the water supply's direction and priorities. It is understood that the expected costs and timelines for individual projects may change as time goes on. The CIP does not establish an enforceable schedule for the completion of the projects listed within the plan.

The entire CIP must be submitted to the MDEQ and then re-submitted whenever it is updated.

- e) *A summary detailing the funding structure and rate methodology that provides sufficient resources to implement the AMP.*

The funding structure and rate methodology are the final products for the AMP. While all of the previous pieces aim to identify the most efficient way to utilize the water system's funds, none of them work toward identifying where that funding comes from. The questions of how much funding is necessary and how to get it can both be answered once the CIP is drafted and the costs and schedule are known.

The rate methodology is a tool to determine rates and charges that will provide sufficient revenues to cover operation, maintenance, replacement, capital improvement projects, and debt costs. The budget should consist of the actual budget line items for those expenses related to the water system.

There should be a line item in the budget for capital improvement projects, which are projects that the utility has an extended period of time to plan for, and which usually cover high cost, non-recurring items. Ideally, the planning period for these projects would be looking out at least 20 years, with a minimum of five (5) years. It is understood that the specific expenditures and needs of the utility in the latter years are more speculative than the needs for the first five (5) years. However, planning for these long term needs will provide a better opportunity for the water system to plan and address its capital needs.

Rates and charges are developed based upon the billable units the community employs once total system expenses have been identified. The billing units are divided by the system costs to calculate a rate or charge per billing unit. This will provide sufficient revenues to cover those expenses. Revenues must equal or exceed the expenses or the community will be forced to subsidize the water system with outside funds. If subsidies occur, then the users of the water system are not paying for the true cost of service – someone else is making up the difference. While temporary subsidies are sometimes necessary to cover unexpected costs, continued use of subsidies will result in either significant rate increases in the future or the financial collapse of the water system. The rate calculation is an accurate and straightforward method for determining rates and charges that will generate sufficient revenues.

Rate resolutions and rate ordinances are the legal documents that implement the rates and charges of the water system. The rates and charges identified in the rate methodology are implemented by the community to insure sufficient revenues are generated to cover system expenses.

The submission to the MDEQ must include the following elements:

- **Annual operating budget**
- **Current rates**
- **Documentation of legal authority for rate setting**
- **Analysis of how the rates and other funding sources offset the anticipated costs**
- **Plan to close the funding gap (if present)**