



WATER ASSET MANAGEMENT PLAN

City of Norton Shores, MI
WSSN: 04850

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Where we're going: System Goals



INTRODUCTION

About this Document

This document is our Water Asset Management Plan. It defines the goals and guiding principles for our asset management activities. With input from our community, the Asset Management Plan will be maintained through a joint effort of our staff, administration, and elected officials. We will update our Plan on a 5 year schedule to ensure its relevancy and effectiveness.

A companion document, our Water Asset Management Program, shows how we will apply the principles of asset management to achieve the goals outlined in this Asset Management Plan.

Our Commitment

Our community water system is a complex set of components that we operate and maintain in a way that provides us with clean and reliable drinking water. That system includes assets such as interconnections which supply our water and a pipe network which distributes our water. As members of our community, each one of us helps pay for the operation, maintenance, and replacement of those system assets through our utility rates. In effect, we are all owners of the water system. As the system owners, we commit to proactively manage our system assets and make decisions based on long term lifecycle cost.

Asset Management Principles

All infrastructure deteriorates with age and requires proactive management to operate, maintain, repair, and eventually replace each physical component, or asset. This progression over time from routine operation and maintenance through repairs and eventual replacement is the asset's life cycle. Waiting to perform maintenance or make repairs can save money in the short term but may decrease the life cycle of an asset. On the other hand, replacing an asset before it fails may not take full advantage of the asset's value. It is this balance which puts the decisions for operations, maintenance, repair, and replacement actions at the heart of asset management.

Asset management is an evaluation of needed actions after considering the condition of an asset, the consequences of an asset failure, and the action alternatives available. The solution that provides lowest life cycle cost at the desired level of service is implemented.

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PART 1: DEFINING OUR GOALS – WHAT IS OUR DESIRED LEVEL OF SERVICE?

Our mission is to provide clean potable water for our community by proactively managing our water distribution assets to meet our desired level of service goals.

Our community, as the system owners, must determine the level of service we want from our system. Many factors play into this determination including: compliance with regulations, public health, aesthetics, service reliability, stable rates, etc. To this end, we have established the following primary goals:

Goal 1: Meet Regulatory Requirements

Our water system provides high-quality drinking water which meets or exceeds all regulations established in the Michigan Safe Drinking Water Act. Our system operators routinely test for contaminants in the drinking water according to Federal and State laws. We strive to achieve continued compliance with environmental regulations and provide the cleanest, safest water achievable with the facilities we have.

Goal 2: Minimize Service Interruptions

Service interruptions from water main breaks, repair operations, and asset replacements are an inevitable part of operating a water system. However, by proactively managing and investing in our system, we can minimize how often these interruptions occur.

Goal 3: Minimize Public Hazards

Water main breaks can cause significant damage, not only to the streets above the mains but also to adjacent utilities and property. Additionally, water main breaks may result in boil-water requirements and/or other use restrictions. The American Water Works Association offers a goal guideline of 15 water main breaks per 100 miles of distribution water main. Our system contains 173 miles of water main and our goal is to have less than 26 breaks per calendar year.

To limit the potential damage from main breaks, we will maintain staffing levels to provide emergency response services 24 hours per day, 7 days a week.

Goal 4: Provide Fire Protection in the Distribution System

In accordance with the American Water Works Association Standards Manual of Water Supply Practices M31, we have decided to size our drinking water system to provide water for firefighting. Firefighting can be accomplished using water brought to each site by the fire department and we can provide fire protection by oversizing our water system to allow the use of drinking water as a supplementary firefighting supply. Our system, at a minimum, must be designed to provide for the maximum expected demand for non-firefighting uses (domestic use, commercial uses, manufacturing, etc.). There is no legal requirement that we oversize portions or all of our water mains or water storage to allow the use of drinking water for firefighting.

Oversizing can increase the amount of time water sits within the system (when we are not using it for firefighting) which can create water quality issues in the system.

We will evaluate the desired levels of fire protection in each area of our community. Based on lifecycle costs, water quality considerations, the risks in various areas of our community, and the capabilities of our fire department, we will determine what level of fire protection is desired in various areas.

Goal 5: Minimize Water Loss

Water loss is often a significant source of lost revenue. We monitor the volume of pumped water and billed water which allows an accounting of potential leaked water. Causes of known, unbilled water loss include fire-fighting, hydrant flushing, and main breaks. Other water loss may occur through inaccurate water meters and leakage in the system. The American Water Works Association notes that the average water system can expect up to 10 percent water loss on an annual basis through the various causes of water loss. We will strive to operate and maintain our system to meet the goal of 10 percent or less of annual water loss.

Goal 6: Identify and Replace Lead/Galvanized Water Services

In the early part of the 20th Century, many water systems utilized lead and galvanized metal for water service connections. Later in time, copper services became the norm for use on the public systems. However, lead and galvanized metal may still have been used within homes beyond the point of the public service connection. Under certain conditions, lead and galvanized water services may corrode and adversely affect water quality. We will continue to identify and locate lead and galvanized water services within the public Right-of-Way and implement a program to replace them.

Goal 7: Minimize Life Cycle Costs

The best financial decisions are those which achieve the lowest life cycle costs. This means we consider the full life cycle of each investment each time we evaluate improvements to our system. It is recognized that short term fixes, while they may have lowest immediate costs, may not be the best long term financial decision. Likewise, not spending money on maintenance and repairs can provide short term cost savings but result in asset failure, ultimately increasing lifecycle costs. We intend to manage our system to always pursue the lowest life cycle cost possible for each system asset.

Goal 8: Partner Communities

Our water system serves not only our local residents but is supplied by the City of Muskegon through the West Michigan Regional Water Authority. We also have interconnections to the City of Muskegon Heights, City of Roosevelt Park, Fruitport Charter Township, and Spring Lake Township. In 2014, the City of Norton Shores partnered with Fruitport Charter Township to form the West Michigan Regional Water Authority which has ownership of several water transmission mains through the City of Norton Shores for the mutual benefit with Fruitport Township.

This partnership makes us all co-owners of the water system. As co-owners, we must work together to proactively manage our water system. We will continue to foster good working relationships with our neighboring utility partners to facilitate communications regarding Operation and Maintenance demands, Capital Improvement Plans, and potential rate impacts.

PART 2: INVENTORY - WHAT DO WE OWN?

Our System

Our water system includes assets such as interconnections which supply our water, and a pipe network which distributes our water.

Our Plan

We intend to keep our system inventory current by maintaining records of water system construction/maintenance utilizing a Geographic Information System (GIS) for mapping and a comprehensive data base for asset information. This system will include mapping of all water distribution system assets, and data pertinent to Operations, Maintenance, Repair, and Replacement.

PART 3: RISK OF FAILURE – WHAT ARE THE CONDITIONS OF OUR ASSETS?

Our System

To understand how long each of our assets may last, we must maintain an understanding of their condition and evaluate the potential risk for failure. We will consider functional failure of an asset to be the primary consideration for Risk of Failure. However, physical failure of an asset must also be evaluated. Water pipes, valves, hydrants, and water services can be evaluated based on break history, evidence of corrosion, and age to determine their condition. Non-pipe assets such as buildings and equipment can be inspected to determine their physical condition.

Our Plan

We will keep our condition assessments current by making recurring inspections of the assets at intervals frequent enough to document reasonably expected condition changes. These intervals will vary by asset type and expected asset life cycle. Once evaluation are completed, assets will be ranked based on the likelihood / risk of failure. All Risk of Failure ratings will be on a scale of 1-5 with 5 being the highest Risk of Failure.

PART 4: CONSEQUENCE OF FAILURE – WHAT HAPPENS WITH A FAILURE?

Our System

It is important that we understand the severity of consequences that may occur if any asset in our system fails. Functional failure consequences can occur when pumps stop working, valves cannot be opened/closed, and when water mains become corroded (pipe capacity is lost). Physical failure consequences can occur when we have water main breaks or catastrophic equipment failures.

Our Plan

We will evaluate the Consequences of Failure of each asset, from both a functional and physical failure perspective. We will maintain redundancy on assets with a high Consequence of Failure. All Consequence of Failure ratings will be on a scale of 1-5 with 5 being the highest Consequence of Failure.

PART 5: CRITICALITY – HOW DO WE PRIORITIZE OUR ACTIONS?

Our System

We must prioritize the actions we need to take for our system to meet our Level of Service goals while managing our work loads, utility rates, and minimizing life cycle costs. Criticality is the product of an asset's Risk of Failure and Consequence of Failure. The Criticality of an asset should not be confused with its Consequence of Failure. Criticality, being the product of Risk and Consequence, is simply a measure of priority.

Our Plan

Criticality Ratings will be used to guide the priority of needed improvements and development of the Capital Improvement Plan. Criticality of assets within our system will be determined by multiplying each asset's Risk of Failure rating (1-5) by an asset's Consequence of Failure rating (1-5) to establish the Criticality Rating (1-25).

PART 6: CAPACITY – DO WE HAVE ENOUGH, NOW AND FOR THE FUTURE?

Our System

Our system must meet water demands both now and into the future for industrial, domestic use and fire protection. Over time, the flow demands will change with changes in property use and population. System analysis indicates we are currently meeting typical peak demands and that we need to make some improvement to meet our enhanced-fire protection goals.

Our Plan

Our General Plan outlining the capacity improvements which are needed to keep up with future flow projections, peak demands, and desired fire flow supply is maintained as part of our

requirements under the Safe Drinking Water Act. Additional system analysis is found in our Water System Reliability Study report.

PART 7: OPERATIONS AND MAINTENANCE – KEEPING UP WITH ROUTINE WORK

Our System

Certain portions of our system need routine/on-going service to continue functioning. Our system Operations and Maintenance (O&M) demands are relatively stable and we will manage the system to maintain that stability. We will utilize Computerized Operations Maintenance and Management tools to maintain asset inventories and schedule regular O&M activities.

Our Plan

We have established the following O&M goals:

1. Maintain staffing and equipment levels such that routine O&M activities can be accomplished by in-house staff with a maximum overtime goal of 15%.
2. Utilize in-house staff to verify proper function of all system assets such as equipment, valves, and hydrants.
3. Outside consultants/contractors will be utilized when specialized technical or equipment capabilities are required.

PART 8: CAPITAL IMPROVEMENTS – CONTINUING SYSTEM RENEWAL

Our System

A Capital Improvement Plan (CIP) for our water system is found in our most recent Water Reliability Study (WRS). That study identifies the priorities of proposed water system improvements such as water main replacements, equipment replacements, and major O&M activities.

Our Plan

We will incorporate the recommendations of the WRS into a comprehensive CIP which will document the major projects we plan to complete within the next 20 years. The order and timing of projects will be guided by the Criticality Ratings developed during the asset evaluation process. Project timing may also be driven by availability of outside funding sources such as loans and grants. We will maintain and update our comprehensive Capital Improvement Plan on an annual basis.

PART 9: FINANCIAL STRATEGY – RATE PLANNING AND STABILITY

Our System

All system costs are funded through our water system billings. Our billings are broken into two primary categories: Debt Service charges and Commodity Charges. The Debt Service pays for the bonded investment into the physical assets of the system such as interconnections, regional transmission mains and distribution piping. Those assets must be in-place before any actual water can be used and must be maintained regardless of the amount of water used. The Commodity charge is based on the cost to supply and distribute the actual water. It is the smaller of the two primary cost categories and is based on the actual amount of water used.

The billings also support O&M activities and payments on utility bonds (borrowed money) used to fund major system improvements.

Our Plan

We intend to maintain a life cycle forecast of anticipated costs, income from rates, and cash balances. We will use this forecast to establish sustainable and stable utility rates. This in turn helps our residential, business, and industrial owners in their individual, long-term financial planning.

We intend to fund system O&M on a cash basis through the rate structure and intend to maintain minimum cash balance equal to 18 months of standard O&M. This will also allow us to cash fund emergency repairs and minor unanticipated asset repairs/replacements.

We intend to also cash fund planned system repairs and replacements if that can be accomplished with a stable rate structure and appropriate cash balances. Significant expenditures may be bond financed to stabilize rate impacts and maintain reasonable cash balances.

SUMMARY

Our Asset Management Plan is a compilation of goals to guide us in maintaining a reliable water system. By achieving these goals, our utility system will be proactively managed to provide the Desired Level of Service for the lowest possible long term cost.