

Asset Management Guidance for Water and Wastewater Systems

What is Asset Management?

Water and wastewater systems are made up of assets. Some of these assets are buried and are "invisible" while others are visible. Water system assets include wells, pipes, valves, storage tanks, pumps, water treatment plants and any other components that are necessary to operate the water system. Wastewater system assets include ponds, mechanical plants, pumps, lift stations, valves, collection lines, force mains, manholes and any other components that are necessary to operate the wastewater system. As a water and/or wastewater system ages and deteriorates, the assets will lose value over time. As this happens, the level of service that the utility's customers desire may become compromised, operation and maintenance costs can increase and the utility may have extreme costs that it can't afford.

Asset management is a method of managing the utility's assets. Asset management will assist the utility with making good decisions on caring for the aging assets. The Environmental Protection Agency (EPA) defines asset management as "a planning process that ensures that you get the most value from each of your assets and have the financial resources to rehabilitate and replace them when necessary." The goal of asset management is to ensure the long-term sustainability of the water and/or wastewater utility. By effectively managing the assets the utility will be able to maintain the desired level of service.

The Five Core Components of Asset Management

1. **Assets** - This involves making a complete list of all assets in the system. For each asset, include as much information as possible in the document including name brand, serial and model numbers, size of pumps, horsepower of motors, any notes on replacement or maintenance on the asset, or any other information that is important to note about the asset. The Condition is a description of the current age and level of preventative maintenance performed on the asset. Include addresses for all assets. A parcel code can be used for locations without a physical address. Taking pictures of each asset may be helpful in keeping track of multiple assets. Items to consider when making a list of your assets:
 - i. What do you own?
 - ii. Where are the assets located?
 - iii. What is the condition?
 - iv. What is the remaining useful life?
 - v. What is the value?

2. **Service Level** - The level of service establishes what your utility wants your assets to provide. In addition, it outlines your goals in order to provide your customers what they want from your utility. The goals can be in several areas such as water loss, water quality and should be "SMART" (specific, measurable, attainable, realistic or relevant, and time bound). For example, "The water utility will provide water at a minimum pressure of 50 psi 95% of the time." This goal is specific as it states very clearly what the utility is trying to accomplish. This goal is measurable as the pressure can be checked throughout the distribution system. This goal is attainable if the utility has proper storage and pumping facilities to meet that pressure level. This goal is realistic as it is at a level that customers would want the utility to maintain. Finally, this goal is time bound by stating that the pressure will be met 95% of the time. This allows for time periods when the system is down for repairs when the pressure may drop below 50 psi. It is a good idea to review and measure how the utility is meeting the goals periodically and to

report the results to the public or decision-makers with the utility at least annually. Items to consider when discussing service level:

- i. What do your customers want?
- ii. What are your customers willing to pay?
- iii. What are you able to provide?
- iv. How will you measure your performance?

3. **Criticality** - The Criticality Analysis Rating is a description of how critical an asset is to the water and wastewater system. Items to consider when deciding on the criticality include the likelihood of failure and the consequence if the asset fails. It is important to remember that some assets are more critical than others in the system. Those assets that are more critical should be the focus of the utility staff and money.

- i. What is the probability of failure?
- ii. What is the consequence of failure?
- iii. Do you have backup equipment?
- iv. Can you increase energy efficiency?

4. **Life Cycle** - The utility will need to make decisions as to how they will operate and maintain their assets including deciding when to continue to repair an asset and when to replace it. Typically, by spending more on routine maintenance means spending less on replacement. Generally speaking, routine maintenance is cheaper than replacing assets. Utilities will need to evaluate how much time and money is devoted to routine maintenance and that will involve thinking about the criticality of the assets. More routine maintenance should be performed on the highly critical assets than those that are less critical.

- i. What is the life expectancy of your assets?
- ii. What are the operation and maintenance costs?
- iii. What will it cost to replace them?
- iv. How do you know when to repair or rehabilitate and when to replace?

5. **Funding** - The utility managers will need to decide how much money is needed for operations, routine maintenance and replacement of assets. Communication is extremely important between both the decision makers and operations staff when discussing funding.

- i. Where will you get the money for operation and maintenance?
- ii. Where will you get the money for asset replacement?
- iii. Where will you get the money for increasing energy efficiency?

Using the Template

Each template is designed so that the first page titled Water System Inventory (or Wastewater System Inventory) is a summary of assets and dollar amounts that are entered into the document for all assets. All dollar amounts that are entered into the document will automatically appear on the Inventory. At the bottom of the Inventory page is a Criticality Analysis Rating and Condition. When the Year Installed is entered into the cells the document will automatically calculate the Replacement Date and Remaining Life for each asset. When the Original Cost is entered into the cells, the document will automatically calculate the Current Value and Annual Depreciation for each asset. At the back of the Asset Management document is space for any maintenance records to be entered. It is important to enter as much information into the template as possible about your assets. Also, assets change over time so it is important to review and update the asset inventory on an annual basis.

Sources

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