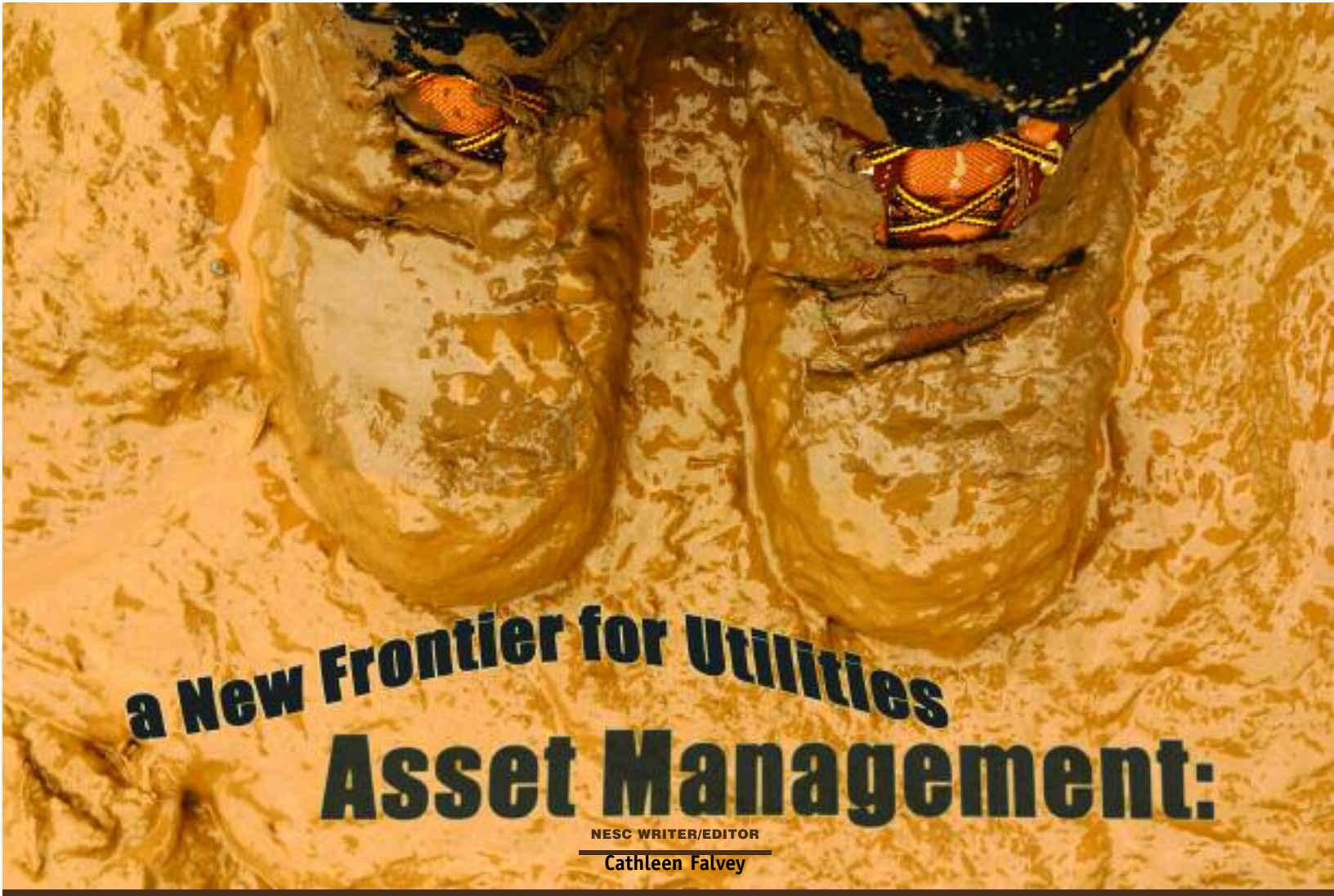

Asset Management: a New Frontier for Utilities

NESC WRITER/EDITOR
Cathleen Falvey

It's 2 a.m. on a cold, rainy fall morning. Leo, the public works director for the small rural community of Summerville, is waking up to another emergency phone call.

A pump has failed at a local sewage lift station, and if he doesn't get there quickly, raw sewage could back up and pollute a nearby stream. He wonders if he'll have the parts he needs on hand to fix the problem. As he laces up his boots, Leo tries to recall just how many times over the past three years he's been forced to leave his bed for an emergency like this one. It seems to be happening more and more.

"Things have been breaking down right and left at both the wastewater and water plants," he thinks to himself. "The equipment is getting old, so you'll have that. Still, it would be nice if we could predict which parts need to be replaced first so we can avoid a violation and so I can get some sleep." But Leo realizes there's only so much he can do with the time and money he has. It seems he only ever has enough of both to put out fires.

Meanwhile, down the road, in the neighboring town of Quiet Dell, Judy, the water treatment plant supervisor, is also spending a sleepless night. Judy is worried because she's slated to go before town council later in the day to request money to upgrade the treatment works and distribution system. She's certain the investment is needed now to prevent future problems and save money in the long run, but she's not sure the council will agree. Money is tight right now in Quiet Dell. The treatment plant has been running smoothly for a long time, and the council even increased her budget slightly last year. Although she could go into the meeting and scare everyone with worst-case scenarios of what could go wrong and speak in generalities about how waiting could cost the town more money, she doubts she'll convince anyone. If only she had the time and the data to prepare a detailed estimate to show council members exactly how much money the town could save by making the upgrades now, she knows they would make the right decision.

Leo and Judy are not alone in their worries. Many small treatment plant supervisors across the country face similar nightmares. Whether they serve 1,000 or 100,000 people, water and wastewater utilities are expected to provide continuous, high-quality service to their customers. Anything less can have dire consequences for public health and the environment. Typically, small system managers are expected to maintain this high level of service with a lot less money than their counterparts in the city. It's no wonder they're losing sleep.

Besides money, what Leo and Judy need most is information. They need to know more about their systems to manage them effectively. Imagine for a moment that Leo had, at his fingertips, data on

the age of all his pumps, their expected life cycles, how recently they've been serviced, and the parts he needs to keep in stock. Imagine that he had access to all the information he needed to plan and prioritize routine maintenance for all the pumps based upon their importance to the smooth running of the system in relation to the needs and criticality of all the other system components. If Leo were able to access data like that everyday at work—information that could help him plan and use his limited time and resources as efficiently as possible—system failures may be a lot less common in Summerville. Leo could move from putting out fires to preventing them.

Likewise, if Judy had access to detailed information about all of her system's physical assets, their cost, condition, and remaining years of service, she could compare the cost of operating, maintaining, and repairing them with the cost of replacing them with newer, more efficient models. This could give her more meaningful information to present to the council and a better chance of receiving the funding she needs. Another possibility is, after analyzing all the data and prioritizing her assets, Judy may decide that extensive upgrades are not as immediately critical as she previously thought. This would allow her to budget for the upgrades and give the council advance warning about investments they will need to make in the plant over the next few years.

By gathering information about their systems' assets and using that information to run the systems as cost-effectively and efficiently as possible, Judy and Leo are practicing asset management.

What is asset management?

Asset management is a structured, "holistic" approach to system management that relies on information about the condition, cost, and use of the system's physical assets. An asset is defined as a physical facility or a component of a physical facility that has value and that enables a service to be provided. Assets that communities should be concerned about managing typically have a useful life of more than a year.

Although asset management is not a new concept, its application to water and wastewater treatment facilities was pioneered in Australia and New Zealand and is relatively new in the U.S. All water and wastewater operators currently manage their assets in some way—the key is to do it well. The goal of

CONTINUED ON NEXT PAGE

EPA Defines Asset Management

In the publication, *Asset Management: A Handbook for Small Water Systems*, the U.S. Environmental Protection Agency (EPA) outlines a simple asset management program. Although asset management programs vary in complexity, EPA suggests the following five steps for implementing asset management in a small utility:

1. Taking Inventory

Completing an inventory of system assets includes evaluating and reporting each asset's condition, its age, its service history, and its "adjusted" useful life. Inventory is often the most labor-intensive part of the asset management process for utilities. Identifying, locating, and evaluating all of a system's assets can be time-consuming, although many systems have begun or completed this process to comply with GASB 34. The expected useful life of various system components can be found by using industry lists and cost indexes. Using this information, utilities can estimate an "adjusted" useful life for each asset by taking into account its service history and current condition. For example, the expected useful life of a given pipe may be 40 years, but if the pipe is in poor condition due to lack of maintenance or other conditions, a manager may decide to adjust the useful life by 10 years. Managers then subtract the age of the pipe (10 years) to determine its remaining useful life (20 years).

2. Prioritizing Assets

After taking inventory, utility managers need to devise a system for prioritizing their assets. The simplest way is to base priority on the remaining useful life, assigning the highest priority to assets with the shortest remaining useful life. Other, perhaps better, factors to take into account when prioritizing include the asset's importance to delivering a high-level of service (i.e., safe drinking water). The asset's "criticality" to the rest of the system and whether other assets in the system can do the same job (redundancy) are also considerations. Assets that are more important to the system's ability to protect public health should be given a higher priority, as should assets for which there is less redundancy.

3. Developing an Asset Management Plan

Now that the assets have been prioritized, utility managers need to plan for and schedule the future rehabilitation and/or replacement of each asset. In other words, they must formulate a capital improvement plan for the system. EPA suggests that utilities calculate the amount of money they will need to set aside each year in an annual reserve fund to pay for each asset.

4. Implementing the Plan

This step requires the utility manager to work out a detailed system budget. The manager will prepare a financial forecast by estimating the revenue the treatment plant expects for the next five years. Next the manager compares the forecast with the scheduled upgrades in the plan to determine if the utility will need to put aside additional funds in reserve, find ways to save money (such as sharing assets with a neighboring community), find additional funding, or increase customer rates. This exercise is not meant to replace traditional accounting methods.

5. Reviewing and Revising the Plan

The plan can be updated if priorities change and as new information becomes available. EPA suggests reviewing the plan on at least an annual basis.

Source: *Asset Management: A Handbook for Small Water Systems*, U.S. Environmental Protection Agency Office of Water, September 2003, EPA 816-R-03-016. **www.epa.gov/safewater/smallsys/pdfs/guide_smallsystems_asset_mgmnt.pdf**.

Asset management helps utilities save money both in the long- and the short-term.

"good" asset management (also called "advanced," "strategic," or "total" asset management) is to minimize the cost of owning and operating assets over time while continuously delivering the required and desired customer service. In layman's terms, asset management is getting the most bang for the infrastructure buck.

Why is asset management important?

Saving money has always been especially important for small communities, but the need to manage assets wisely will be critical for all utilities in the future. Operating costs in the industry are increasing as are costs of infrastructure improvements. EPA anticipates that the gap between drinking water and wastewater infrastructure needs and infrastructure spending and funding will widen significantly in the future. (For more information, refer to the report, The Clean Water and Drinking Water Infrastructure Gap Analysis, which can be downloaded at **www.epa.gov/safewa ter/gapre port.pdf**.)

In addition, the federal government recognizes the importance of asset management and is beginning to encourage utilities to implement programs. A bill, S. 2550, approved in June 2004 by the Senate Committee on Environment and Public Works, ties state revolving fund (SRF) eligibility to asset management through a priority system. The bill asks states to give more weight to applications for assistance from water and wastewater treatment works that include (1) an inventory of assets, including a description of the condition of those assets; (2) a schedule for asset replacement; and (3) a financing plan, indicating sources of revenue from rate payers, grants, bonds, and other loans and sources. Although the bill is not expected to become law this year, communities should take note. As with the Government Accounting Standards Board Statement (GASB 34) guidelines that came before it, asset management is not mandatory. However, in the future, communities may find it difficult to obtain funding or a good credit rating without good asset management practices.

Another incentive for utilities to embrace asset management is that it helps with GASB 34 compliance. GASB 34 is a method of accrual accounting and financial reporting that publicly-owned utilities are encouraged to use to report historical costs and depreciation on all infrastructure assets. Although GASB 34 financial statements also include discussion and analysis of assets and future spending, the goal of asset management is broader. Operators and facility managers can use asset manage-

ment to generate schedules for routine and preventative maintenance, for example. GASB 34 compliance can be seen as an important component of a utility's asset management program.

Another initiative closely related to asset management is capacity, management, operation, and maintenance or "CMOM." EPA has proposed that wastewater systems be required to submit CMOM plans to obtain National Pollutant Discharge Elimination System (NPDES) permits. CMOM is similar in many respects to asset management. Implementing asset management programs can only simplify CMOM compliance for wastewater facilities.

One clear advantage of asset management for utilities is its usefulness as a planning tool. Small communities around the country will find it indispensable as they face population growth or decline or other changes, such as the need to increase security spending or comply with increasingly stringent environmental regulations. Asset management allows communities to be proactive, not reactive, to changing needs and helps them make better financial decisions.

Asset management database will help communities

Trainers and small communities will soon have free software available to help them navigate the asset management process. Compliance assistance providers and trainers at the Maryland Center for Environmental Training (MCET) of the College of Southern Maryland and Delaware Technical and Community College (Delaware Tech) have been collaborating with small community wastewater facilities in their area to perfect the program. The database program is scheduled to be released in June 2005 and is written in Microsoft Access, part of Microsoft Office. According to MCET Director Karen Brandt, the database project is part of a three-year partnership between MCET and EPA to pilot asset management for small communities.

"We're working with four small communities to develop the program—the towns of Denton and Easton in Maryland, and Selbyville and Seaford in Delaware," says Brandt. "It's been very helpful—we're asking these guys to use this program, put it in, run it, and test it out for us, and they've been very specific about what they do and don't like. So the program is being changed and simplified according to the communities' needs."

Brandt says that system size and simplification are important issues with asset management training. She says that there's already lots of help and asset management information available for large systems, and because of their layers of staffing, these larger systems can better handle the work involved in launching asset management programs. There seems to be only a handful of trainers currently focusing on asset management for small utilities.

"System size is a huge issue because of the staffing," says Brandt. "In small systems you're talking about a superintendent and an operator running a wastewater treatment plant. It's a laborious process at best in the beginning when you're getting all of your asset information together, and a lot of small systems don't have that information. Part of the goal of our pilot program was to find out if small systems can implement asset management programs, and we're finding the answer is yes, absolutely."

Brandt says another goal of the pilot program is to find a cost-effective way for small communities to implement asset management, so as they developed the database program they made it small system-friendly. She says simplicity is the rule when it comes to almost everything with small systems because they just don't have the time.

"The database program started out as a mechanism to help communities capture their assets, because the first thing you have to do with asset management is know what you've got," says Brandt. "The program helps communities capture their assets and their assets' value—the condition, evaluation, and criticality of the assets are all captured. Then the database has a preventative maintenance component. Now it is also doing one thing we really wanted it to—which is to generate a prioritized list of assets."

Brandt says the program allows operators to track exactly how much an asset costs them to maintain, because they can enter an employee and his time with an identifier and that information will be put on the asset. Although people are not considered assets in asset management, Brandt is finding that there still is a people component. For example, when a system purchases a pump, if they install it themselves, that labor becomes part of the capital cost.

"And they'll be able to see exactly how much they're spending for something and fixing it when it breaks down," says Brandt. "So they'll be able to judge, 'oh, wait a minute, we're putting an awful lot of money into this asset, and the new one is $12,000, but look at the trend we've got here.'"

"The database also runs parallel to an accounting program, meaning it uses the same language and principles of accounting in order to help systems comply with GASB 34," says Brandt. "This is one of the things we've been very careful with."

Although operators will not be able to use the database to generate their GASB 34 financial statements, Brandt says they will be able to depreciate their equipment and do a capital improvement plan (CIP).

"The initial steps of a CIP will come out of there. They'll have their prioritized list, and then, obviously, people need to come in and make decisions," says Brandt. "We're looking at everything—operations, maintenance, asset retention, replacement, rehabilitation, management, and financial. The idea behind asset management is that it enables (the utility) to be financially sound, so it can stand alone and survive. That's the whole picture in a nutshell."

For more information about the Maryland Center for Environmental Training (MCET), visit **www.mcet.org**. For information about asset management courses offered at Delaware Tech, visit **www.dtcc.edu**.

This article was first printed in the Fall 2004 issue of the NESC newsletter E-Train.