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January 2016

WATER INFRASTRUCTURE

EPA and USDA Are Helping Small Water Utilities with Asset Management; Opportunities Exist to Better Track Results

Accessible Version

GAO-16-237

GAO Highlights

Highlights of GAO-16-237, a report to congressional requesters

January 2016

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EPA and USDA Are Helping Small Water Utilities with Asset Management; Opportunities Exist to Better Track Results

Why GAO Did This Study

Recent catastrophic breaks in water mains and sewer discharges during storms are indicators of the nation's old and deteriorating water and wastewater infrastructure. EPA estimates that small water utilities—those serving fewer than 10,000 people--may need about $143 billion for drinking water and wastewater infrastructure repairs and replacement over 20 years. EPA and USDA provide the three largest sources of federal funding for water infrastructure. In a March 2004 report, GAO found that water utilities may benefit from implementing asset management—a tool used across a variety of sectors to manage physical assets, such as roads and buildings.

GAO was asked to review water utilities' use of asset management. This report examines (1) what is known about the use of asset management among the nation's water utilities—particularly small water utilities—including benefits and challenges and (2) steps EPA and USDA are taking to help small water utilities implement asset management. GAO selected a nongeneralizable sample of 25 water utilities in 10 states based on largest infrastructure needs and interviewed EPA, USDA, state, and water utility officials.

What GAO Recommends

GAO recommends that EPA consider collecting information about utilities' use of asset management through its needs assessment surveys, and that EPA and USDA compile the benefits of asset management into one document. EPA and USDA generally agreed with GAO's findings and recommendations.

View GAO-16-237. For more information, contact J. Alfredo Gómez at (202) 512-3841 or gomezj@gao.gov.

What GAO Found

The small water utilities GAO reviewed in 10 selected states are implementing some asset management practices, although state officials said that large water utilities are more likely to implement asset management than small utilities. The asset management practices these small utilities used include identifying key assets, such as pipelines, treatment plants, and other facilities, and assessing their life-cycle costs. For example, officials from 23 of the 25 small water utilities GAO reviewed said they had maps that identify the location of at least some of their assets. However, of the 25 small water utilities, officials from 9 said they knew the cost of rehabilitation versus replacement for all of their assets. Officials from the Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), and the 10 selected states identified benefits and challenges for small water utilities using asset management. The benefits that EPA, USDA, and state officials identified include cost savings and more efficient long-term planning. The key challenges these officials identified include the availability of funding to cover start-up and maintenance costs, the availability of human resources, information on how to implement asset management practices, and political support from elected officials to begin an asset management program or increase user rates.

EPA and USDA are taking steps to help water utilities implement asset management by providing funding, free or low-cost tools such as software, one-on-one technical assistance, and classroom training for small water utilities that plan to implement asset management practices. EPA and USDA collect feedback from training participants, but do not collect information that will help track the results of the agencies' training efforts (e.g., whether utilities participating in such training implemented asset management practices). GAO identified in a March 2004 guide that evaluating training programs is key to ensuring training is effective in contributing to the accomplishment of agency goals and objectives. EPA officials told GAO that they had considered collecting nationwide data on water utilities' use of asset management but did not have the resources to pursue it. Leveraging existing data collection methods may be a cost-effective way for the agencies to collect this information. EPA conducts periodic needs assessment surveys of water utilities and has included questions about asset management use in the wastewater survey, but not in the drinking water survey. EPA officials said they did not receive enough responses to questions in the wastewater survey, and they have not considered including them in the drinking water survey. By continuing to include questions on wastewater utilities and considering questions about drinking water utilities' use of asset management in the surveys, EPA could have better assurance that it has information on the effectiveness of its training efforts with USDA. In addition, EPA and USDA officials told GAO that the agencies share anecdotal data on the benefits of asset management through technical assistance, but had not considered compiling such information into one document to encourage water utilities to adopt it. EPA and USDA are not required to compile such information, but doing so could provide information on benefits, including cost savings, and costs to water utilities that have not received training and could help encourage them to adopt asset management practices.

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Abbreviations

CBO	Congressional Budget Office
CUPSS	Check Up Program for Small Systems
EFC	Environmental Finance Center
EPA	Environmental Protection Agency
GIS	geographic information system
ISO	International Organization for Standardization
OMB	Office of Management and Budget
PAS	Publicly Available Specification
SDWA	Safe Drinking Water Act
SRF	State Revolving Fund
USDA	U.S. Department of Agriculture

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January 26, 2016

The Honorable Ken Calvert
Chairman
Subcommittee on Interior, Environment, and Related Agencies
Committee on Appropriations
House of Representatives

The Honorable Betty McCollum
Ranking Member
Subcommittee on Interior, Environment, and Related Agencies
Committee on Appropriations
House of Representatives

The Honorable Mike Simpson
House of Representatives

Recent catastrophic breaks in water mains and sewer backups and discharges during storms are indicators of the nation's old and deteriorating water and wastewater infrastructure. The American Society of Civil Engineers estimated in a 2013 report that there were more than 1 million miles of drinking water mains and 700,000 to 800,000 miles of public sewer in the country, much of which was in poor condition.[1] Drinking water and wastewater infrastructure that is old and deteriorating is at a higher risk of failure. Such infrastructure failures can disrupt the availability of drinking water and impede emergency response, such as fire-control efforts, or jeopardize public health by releasing sewage into surface waters and drinking water sources. Emergency repairs of such infrastructure can pose significant financial costs to communities. A water utilities' management professional estimated that emergency repairs can cost three to four times more than regular repairs—for example, if the cost to repair 1 mile of pipe is $550,000, the cost to repair this same pipe in an emergency could range from $1.7 million to $2.2 million.

[1]American Society of Civil Engineers, *2013 Report Card for America's Infrastructure* (Reston, VA: American Society of Civil Engineers, 2013).

According to the Environmental Protection Agency's (EPA) most recent estimates, more than $655 billion may be needed to repair and replace drinking water and wastewater infrastructure nationwide over the next 20 years.[2] Large water utilities—those serving populations of 100,000 or more—account for more of the projected infrastructure repair and replacement needs. EPA estimates that large water utilities may need an estimated $145 billion to repair and replace drinking water infrastructure and an estimated $219 billion for wastewater infrastructure (for a total of $364 billion). However, the majority of water utilities are small—serving populations of 10,000 or less,[3] and EPA estimates that small water utilities may need an estimated $110 billion for drinking water infrastructure and $33 billion for wastewater infrastructure (for a total of $143 billion).

Across the country, there are about 52,000 drinking water and 16,000 wastewater utilities. These water utilities[4] are generally subject to requirements under the Safe Drinking Water Act and Clean Water Act, respectively.[5] EPA and states regulate water utilities' compliance with these provisions, but the water utilities and the communities they serve are responsible for managing and funding the infrastructure needed to implement requirements, including the costs of repairs and replacement. Communities can fund construction, repair, and replacement of

[2]EPA's most recent water infrastructure needs assessments estimated that funding needs for drinking water infrastructure totaled $384.2 billion (as of 2011) and for wastewater infrastructure totaled $271 billion (as of 2012). EPA conducts a separate survey and assessment for each type of infrastructure, drinking water and wastewater, on separate 4-year schedules. These cost estimates reflect the 20-year projected drinking water and wastewater infrastructure costs starting with the year that each survey was conducted. See *EPA, Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, EPA 816-R-13-006 (Washington, D.C.: April 2013) and *EPA, Clean Watersheds Needs Survey 2012: Report to Congress*, EPA-832-R-15005 (Washington, D.C.: Jan. 2016). Throughout this report, all dollar figures, such as these costs, are expressed in nominal dollars, unadjusted for inflation.

[3]EPA uses the term "small" to refer to water utilities serving populations of 10,000 or less, and the U.S. Department of Agriculture uses "rural." Throughout this report, we use the term "small" to refer to these water utilities.

[4]We use the term "water utilities" to refer to both drinking water and wastewater utilities.

[5]The Safe Drinking Water Act applies to certain public water systems. Safe Drinking Water Act, Pub. L. No. 93-523, 88 Stat. 1660 (1974)(codified as amended at 42 U.S.C. §§ 300f–300j-26 (2015)). The Clean Water Act applies to all wastewater treatment. The Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816, codified as amended at 33 U.S.C. §§ 1251-1387 (2015) (commonly referred to as the Clean Water Act).

infrastructure through such options as cash, municipal bonds, grants, and loans. The costs, including the repayment of loans, are funded through the rates communities pay on their water bills.

The federal government provides significant funding to assist water utilities. The three largest federally funded drinking water and wastewater infrastructure assistance programs are EPA's Drinking Water State Revolving Fund (SRF) program[6] and Clean Water SRF program,[7] and the Department of Agriculture's (USDA) Water and Waste Disposal program.[8] Through the Clean Water and Drinking Water SRF programs, EPA provides annual grants to state-level SRF programs. States use the SRF funds to, among other things, make loans to local communities and utilities for various water infrastructure projects, such as upgrading and replacing drinking water filtration and treatment plants and water mains, and constructing, repairing, and replacing sewage treatment plants and sewer pipelines. Communities of any size can apply for assistance through the SRF programs. In fiscal year 2015, EPA provided an estimated $1.6 billion for the Drinking Water SRF and $1.4 billion for the Clean Water SRF. USDA's Rural Utilities Service administers the Water and Waste Disposal program, which provides subsidized loans and grants for both drinking water and wastewater infrastructure projects in small communities. In fiscal year 2015, USDA made an estimated $1.7 billion available through the Water and Waste Disposal program. Small water utilities generally rely more on federal assistance to fund repairs and replacements to infrastructure than large water utilities, according to a 2012 Congressional Research Service report.[9]

In a March 2004 report, we found that water utilities may benefit from implementing asset management practices to better identify and manage their

[6]EPA's Drinking Water SRF program was created under the Safe Drinking Water Act Amendments of 1996. Pub. L. No. 104-182, § 130, 110 Stat. 1613, 1662–1672 (codified as amended at 42 U.S.C. § 300j-12 (2015)).

[7]EPA's Clean Water SRF program was created under the Water Quality Act of 1987. Pub. L. No. 100-4, § 212, 101 Stat. 7, 21-28 (codified as amended at 33 U.S.C. §§ 1381–1388 (2015)). The Water Quality Act of 1987 amended the Clean Water Act.

[8]USDA's Water and Waste Disposal program was created under the Consolidated Farmers Home Administration Act of 1961, Amendments. Pub. L. No. 89-240, § 1, 79 Stat. 931, 931-932 (codified as amended at 7 U.S.C. § 1926 (2015)).

[9]Congressional Research Service, *Water Infrastructure Needs and Investment: Review and Analysis of Key Issues.* RL31116, (Washington, D.C.: Dec. 28, 2012).

infrastructure needs.[10] Asset management is a widely recognized tool used across a variety of sectors to manage physical assets, such as highways, machinery, and buildings; in the case of water and wastewater infrastructure, key assets are pipelines, tanks, pumps, and other facilities. According to international asset management standards, asset management is a framework for providing the best level of service to customers at the lowest appropriate cost.[11] For example, in our March 2004 report, we found that, by implementing asset management, a large utility in California found that increasing preventive maintenance on its tanks would be more cost-effective than replacing them, saving the utility approximately $12 million. Federal law does not require water utilities to implement asset management, but federal law does require implementation of asset management in at least one other area. Specifically, federal law requires states to develop and implement an asset management plan for pavement and bridge assets that are part of the National Highway System.[12] Asset management is used by some states to manage real property and highways, by private organizations such as electric companies, and internationally in many sectors. Appendix I provides information about requirements and incentives for asset management.

In our March 2004 report, we found, among other things, that EPA had no central repository to facilitate information sharing on asset management within and across its drinking water and wastewater programs, which would help avoid duplication of effort. As a result, we recommended that EPA better coordinate its initiatives to promote asset management, explore asset management tools developed by other federal agencies, strengthen efforts to educate water utilities on how implementing asset management can help them comply with regulations, and establish a repository of information about asset management on the agency's website. EPA agreed with our recommendations and implemented them by, among other things, holding workshops and coordinating initiatives to provide asset management information. In a previous report, issued in August 2002, we surveyed water utilities serving populations larger than

[10]GAO, *Water Infrastructure: Comprehensive Asset Management Has Potential to Help Utilities Better Identify Needs and Plan Future Investments*, GAO-04-461 (Washington, D.C.: Mar. 19, 2004).

[11]The International Organization for Standardization (ISO) published a general international standard on the use of asset management.

[12]23 U.S.C. 119(e)(1) (2015).

10,000 on how these water utilities manage existing assets and plan for future improvements. We found that more than a quarter of the large water utilities we surveyed did not have asset management plans as recommended by water utility associations but had identified future infrastructure needs.[13] We did not survey small water utilities, and we did not make recommendations in that report. (See the "Related GAO Products" list for GAO's most recent reports related to asset management.)

In 2011, EPA and USDA signed a memorandum of agreement that stated that small water utilities face unique challenges in providing affordable drinking water and wastewater services. It noted that these systems face declining populations, lack financial resources and have not engaged in long-term planning activities, among other challenges.[14] By signing this memorandum of agreement, EPA and USDA agreed to collaborate in promoting ways that small water utilities can better manage their infrastructure needs and emphasized the use of asset management to ensure long-term technical, managerial, and financial capacity.[15]

In this context, you asked us to review water utilities' use of asset management to identify and fund capital improvements in response to rising infrastructure costs. Our objectives were to examine (1) what is known about the use of asset management among the nation's water utilities—particularly small water utilities—including benefits and challenges, if any, for water utilities implementing asset management and (2) steps, if any, that EPA and USDA are taking to help small water utilities implement asset management.

[13]GAO, *Water Infrastructure: Information on Financing, Capital Planning, and Privatization*, GAO-02-764 (Washington, D.C.: Aug. 16, 2002)

[14]EPA and USDA, Memorandum of Agreement Between the United States Environmental Protection Agency and the United States Department of Agriculture-Rural Development Rural Utilities Service, *Promoting Sustainable Rural Water and Wastewater Systems*, (Washington, D.C.: June 2011).

[15]An EPA request for grant applications provides definitions for technical, managerial, and financial capacity. Technical capacity refers to the physical infrastructure of the water utility and the ability of personnel to adequately operate and maintain the system and to apply the necessary technical knowledge (for example, knowledge necessary for certification) to comply with the law and regulations. Managerial capacity refers to the management structure and practices of the utility, for example, ownership accountability, staffing, and communication with customers and regulators. Financial capacity refers to the financial resources of the utility, such as having sufficient revenue, setting user rates, and operation budget and planning.

To examine what is known about water utilities' use of asset management, we interviewed EPA and USDA staff in the agencies' headquarters about the data they collect from water utilities, including data EPA collects in national assessments of water utilities' infrastructure needs that it conducts every 4 years. In addition, we interviewed state officials responsible for managing EPA's Drinking Water and Clean Water SRF programs as well as officials in USDA's state offices in a nonprobability sample of 10 states. To select these states, we used EPA's most recent needs assessment data (i.e., 2011 for drinking water infrastructure and 2008 for wastewater infrastructure)[16] to identify the state in each of EPA's 10 regions with the highest percentage of small water utility needs. These states were: Arizona, Arkansas, Delaware, Idaho, Iowa, Minnesota, Mississippi, New York, Vermont, and Wyoming. We reviewed relevant documentation and information from EPA staff responsible for maintaining the data to assess the reliability of both data sets and determined that they were sufficiently reliable for the purpose of selecting states and utilities for our review. Because our sample of states and utilities was nongeneralizable, responses from the officials we interviewed cannot be generalized to other states and their water utilities, but they illustrate some of the uses of asset management practices among small water utilities in states with the greatest infrastructure needs. We also interviewed representatives of national water and wastewater associations to identify potential sources of data on asset management. From these interviews, we identified one report and one on-going study. The report by McGraw-Hill Construction was published in 2013 and surveyed 451 persons representing water utilities on their use of asset management.[17] We reviewed the scope and methodology of this report and determined that it was sufficient for our purpose of describing qualitative

[16]At the time of our state selection, EPA had not released its 2012 report. Therefore, we used data associated with the EPA's 2008 Clean Watersheds Needs Survey. EPA, *Clean Watersheds Needs Survey 2008: Report to Congress*, EPA-832-R-10-002 (Washington, D.C.: May 2010).

[17]McGraw-Hill Construction, *Water Infrastructure Asset Management: Adopting Best Practices to Enable Better Investments: Smart Market Report, (Bedford, MA: 2013).* The McGraw-Hill Construction study was conducted in partnership with CH2M, a company that, among other things, provides asset management consulting services. McGraw-Hill Construction provides data, analytics, news, and intelligence for North America. The report described the results of a survey of 451 water utilities in the United States and Canada and the extent to which they had adopted 14 asset management practices. The study also included information from confidential interviews with water utilities on their experiences in implementing asset management.

information to corroborate information we obtained from our interviews about large utilities' use of asset management because the study authors included asset management practices that were similar to those identified by EPA. In 2015, the American Water Works Association surveyed officials with 545 water utilities about their use of asset management practices for the purposes of identifying additional resources the organization could provide to better assist water utilities wanting to start or advance an asset management program. The results of the survey were published in a report in December 2015.[18]

To examine the extent of asset management use in our sample of 10 states, we used EPA's 2008 *Asset Management: A Best Practices Guide*—a federally-developed asset management framework for water utilities.[19] The components and practices of the framework formed the basis of our interview questions. We used the practices in the framework to interview officials in a nongeneralizable, random sample of small utilities in the sample of 10 states. To select small water utilities in these 10 states, we used EPA's Safe Drinking Water Information System and a database of water utilities included in EPA's 2008 *Clean Watersheds Needs Survey* to randomly generate a nongeneralizable sample of two drinking water and two wastewater utilities in each of these states for a total of 40 small water utilities. Of these 40 small water utilities, we conducted interviews with officials from at least one drinking water utility and one wastewater utility in 9 of the 10 states, for a total of 25 water utility interviews.[20] The water utilities we contacted in Mississippi declined to participate or did not respond to our interview requests. We also visited Maine and New Mexico to conduct more in-depth interviews on water utilities' use of asset management. We selected these states based on recommendations from EPA and USDA officials, representatives of national water and wastewater associations, and technical assistance providers.[21] On these

[18]American Water Works Association, *2015 Establishing the Level of Progress in Utility Asset Management Survey Results*," (Denver, CO: Dec. 2015).

[19]Environmental Protection Agency, *Asset Management: A Best Practices Guide*, EPA 816-F-08-014 (Washington, D.C.: April 2008). Hereafter, we refer to this document as "EPA's 2008 best practices guide."

[20]Not all of the small water utilities we contacted responded to our request for an interview.

[21]The technical assistance providers we met with were nongovernmental organizations that provided a range of services to help small communities with regulatory, managerial, and financial needs related to their water utilities, such as training, assistance with completing loan applications, or studies of water rates.

visits, we met with state SRF program and USDA officials, representatives of large and small water utilities, and technical assistance providers. To examine any benefits and challenges for small water utilities in implementing asset management, we analyzed the content of our interviews with state SRF program and USDA officials in the 10 selected states and in-person visits to Maine and New Mexico.

To examine steps EPA and USDA have taken to help small water utilities implement asset management, we reviewed EPA and USDA guidance, reports, training materials, and software tools and interviewed EPA and USDA officials. In addition, we interviewed technical assistance providers funded by EPA and USDA to conduct training sessions that included asset management. These technical assistance providers were the EPA-funded Environmental Finance Centers with the University of New Mexico, Wichita State University, Cleveland State University, and University of North Carolina at Chapel Hill and the national offices and local affiliates in Maine and New Mexico of the Rural Community Assistance Partnership and National Rural Water Association. We compared the information we collected about the steps EPA and USDA have taken with key practices related to federal agencies' training efforts and collection and dissemination of information that we identified in previous reports.[22] Appendix II contains a more detailed description of our objectives, scope, and methodology.

We conducted this performance audit from January 2015 to January 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[22]GAO, *Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs*, GAO-04-291 (Washington, D.C.: Jan. 30, 2004); *Human Capital: A Guide for Strategic Training and Development Efforts in the Federal Government*, GAO-04-546G (Washington, D.C.: March 2004); *Managing for Results: Enhancing Agency Use of Performance Information for Management Decision Making*, GAO-05-927 (Washington, D.C.: Sept. 9, 2005); *Program Evaluation: Strategies for Assessing How Information Dissemination Contributes to Agency Goals*, GAO-02-923 (Washington, D.C.: Sept. 30, 2002).

Background

This section provides background information on (1) asset management for water utilities, (2) federal funding for asset management, (3) water utilities' structures, and (4) EPA's infrastructure needs assessments.

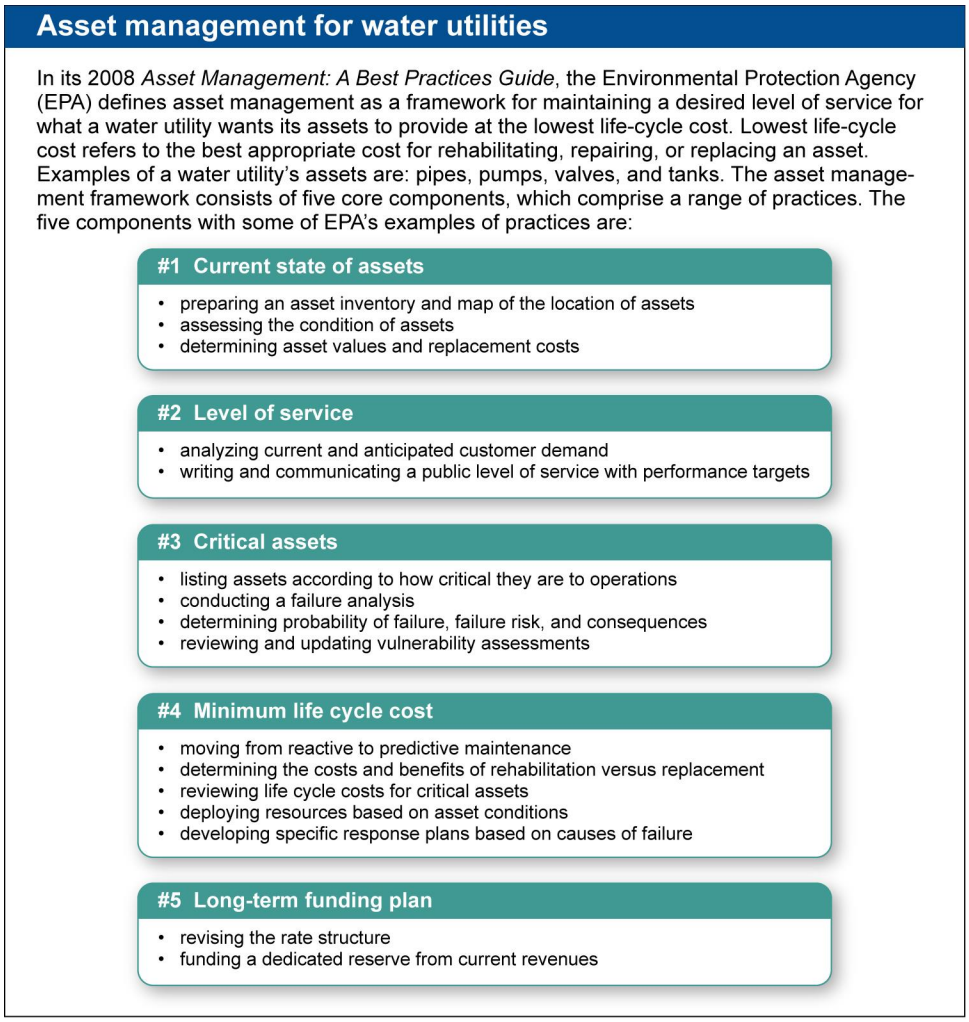
Asset Management for Water Utilities

To assist water utilities in adopting asset management, in 2003, EPA developed an asset management framework for water utilities.[23] In 2008, EPA incorporated this framework into a best practices guide for water utilities based on similar frameworks used by water utilities in Australia and New Zealand.[24] EPA's asset management framework instructs water utilities to (1) assess the current state of their assets, (2) determine the level of service they need to provide to customers, (3) identify those assets that are most critical to their operations, (4) incorporate life-cycle costs, and (5) develop a strategy for the long-term funding of the repair and replacement of their assets. As shown in figure 1, EPA's 2008 best practices guide describes the five components in EPA's asset management framework, which are characterized by a range of practices. According to EPA's best practices guide, these practices can be implemented at varying levels of sophistication, depending on the size and needs of the utility. For example, a small water utility with few assets can document its inventory of assets on paper, although a large water utility with many assets may use a software program.

[23]There are other frameworks and standards for asset management. In 2006, the Water Environment Research Foundation, with funding from EPA and the Water Research Foundation, developed the Sustainable Infrastructure Management Program Learning Environment in 2006 for use by water utilities. Standards include the Publicly Available Specification (PAS) 55, developed in 2004 by the UK-based Institute of Asset Management and British Standards Institution, and the ISO 55000 series, developed by the International Organization for Standardization in 2014. The International Organization for Standardization developed the ISO 55000 series from the PAS 55 and introduced the ISO 55000 series as an international standard in January 2015. Both the PAS 55 and ISO 55000 series are designed for multiple sectors.

[24]EPA, *Asset Management: A Best Practices Guide*, EPA 816-F-08-014 (Washington, D.C.: April 2008).

Figure 1: EPA's Asset Management Framework and Component Practices



Source: GAO summary of EPA's 2008 *Asset Management: A Best Practices Guide.* | GAO-16-237

Together, according to EPA's 2008 best practices guide, these practices make up a water utility's asset management program and are to be documented in the water utility's asset management plan. The asset management plan serves as a written record that the water utility can use much like a budget or strategic planning document to communicate plans,

progress, and future goals and also communicate user rate adjustments and recommended infrastructure investments. According to an EPA fact sheet on building an asset management team,[25] asset management requires water utility staff who can promote and articulate the benefits of asset management.[26] The fact sheet further states that a successful asset management program requires resources, including time and money, to implement, as well as the support of political leaders who have the authority and willingness to commit public resources and personnel.

We and others have cited examples of cost savings resulting from asset management. In our March 2004 report,[27] in addition to the water utility in California that saved $12 million, we found that a water utility in Massachusetts used asset management and saved $20,000 in oil purchase and disposal costs for its pumps and decreased the hours spent on preventive maintenance by 25 percent from the hours recommended by the equipment manufacturer. In addition, a 2007 study of asset management by the U.S. Conference of Mayors also found that public water utilities in cities had experienced savings in capital costs and operations and maintenance as a result of asset management.[28] Further, a 2008 EPA fact sheet about asset management for local officials stated that implementing asset management may require some up-front costs but could result in cost savings for water utilities.[29]

In their 2011 Memorandum of Agreement, EPA and USDA agreed to collaborate in promoting ways that small water utilities could better manage their infrastructure needs and highlighted the use of asset management to ensure long-term technical, managerial, and financial capacity. The agencies also agreed to coordinate agency activities and financial assistance in areas that would increase the technical, managerial, and financial capacity for

[25]In 2008, EPA issued a series of three fact sheets on the topics of best practices for implementing asset management, building an asset management team, and information about asset management for local officials.

[26]Environmental Protection Agency, *Building an Asset Management Team*, EPA 816-F-08-016 (Washington, D.C.: April 2008).

[27]GAO-04-461.

[28]U.S. Conference of Mayors, *National City Water Survey 2007: The Status of Asset Management Programs in Public Water and Sewer Infrastructure in America's Major Cities* (Washington, D.C.: September 2007).

[29]Environmental Protection Agency, *Asset Management for Local Officials*, EPA 816-F-08-015 (Washington, D.C.: April 2008).

small water utilities. The memorandum stated that EPA and USDA would encourage communities to implement system-wide planning, including asset management, and that the two agencies would share and distribute resources to water utilities and provide training and information. In this same memorandum, EPA and USDA stated that both agencies supported increasing the technical, managerial, and financial capacity of water utilities nationwide.

Federal Funding for Asset Management

EPA and USDA funding for asset management activities falls under various larger programmatic budget categories. EPA funds asset management in the following three categories: (1) grants to provide training and technical assistance to water utilities to improve financial and managerial capacity; (2) grants to selected public, private universities or colleges, and nonprofit organizations to provide technical assistance to communities on a range of EPA priorities, including improving financial capacity; and (3) drinking water SRF grants to states, a portion of which may be used for increasing water utilities' technical, managerial, and financial capacity. USDA primarily funds asset management activities through two programs: (1) the Water & Waste Disposal Technical Assistance & Training Grants program, which provides grants to nonprofit organizations in the 50 states for managerial technical assistance, and (2) the Circuit Rider program, which provides training and technical assistance through contracted staff called circuit riders,[30] in each of the 50 states to provide technical assistance to small water utilities on day-to-day operational, managerial, and financial issues. Appendix III provides more details about EPA and USDA funding for asset management.

Water Utilities' Structures

Small communities share some common characteristics in how they manage (govern and staff) their water utilities, according to EPA's 2011 report on the characteristics of small water utilities.[31] The report, and EPA, have made several observations about small water utilities and the small communities they serve. Namely, publicly-owned water utilities are

[30]The name of USDA's Circuit Rider program reflects the delivery of the technical assistance—that is, staff with expertise in operating water utilities travel to provide targeted assistance to water utilities.

[31]Environmental Protection Agency, *National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People*, EPA 816-R-10-022 (Washington, D.C.: July 2011).

typically municipalities, townships, counties, or other public entities. These entities can be governed by boards, mayors, managers, or city or town councils.[32] Privately-owned water utilities are typically governed by corporate entities, homeowner associations, or sole proprietors. For both publicly- and privately-owned water utilities, the governing bodies are responsible for ensuring the water utility complies with state and federal laws and regulations; setting and approving annual budgets; hiring staff; and in many cases, setting and adjusting the rates that users pay. EPA's 2011 report also states that small water utilities are typically staffed with an operator (or superintendent), managers, and administrative staff that may work part-time. In some cases, a publicly-owned water utility may hire a private company to operate and maintain its facility.

EPA Infrastructure Needs Assessments

EPA estimates the nation's drinking water and wastewater utilities' capital infrastructure needs over the next 20 years by administering to states two needs assessment surveys: the *Drinking Water Infrastructure Needs Survey and Assessment* and *Clean Watersheds Needs Survey* every 4 years.[33] In completing the questionnaire for the drinking water needs assessment survey, utilities report infrastructure needs to EPA and for the clean water needs assessment survey states report these infrastructure needs to EPA. EPA then uses the data from the drinking water needs assessment survey to determine each state's grant allocation for its Drinking Water SRF program. According to EPA officials, the agency does not use the clean water needs assessment survey to determine each state's allocation of Clean Water SRF program funds, but it reports the data to Congress and the public.

[32]According to a 2002 Congressional Budget Office (CBO) report on drinking water and wastewater infrastructure financing, 50 percent of all drinking water utilities that serve the public are privately-owned, and about 20 percent of wastewater utilities that serve the public are privately-owned.

[33]The methods that EPA uses to collect information about drinking water and wastewater utilities' needs differs by needs assessment and water utility size. To identify 20-year needs for drinking water utilities for the 2011 needs assessment survey, for example, EPA administered a questionnaire to all large water utilities and a sample of medium-sized water utilities in each state. EPA used data from the 2007 survey to estimate needs for small water utilities. To identify 20-year needs for wastewater utilities for the 2008 and 2012 needs assessment surveys, for example, states collect needs data from wastewater utilities and submit detailed information and supporting documents to EPA. The 2008 and 2012 *Clean Watersheds Needs Surveys* did not include information about the infrastructure needs of privately-owned wastewater utilities.

EPA works with states and the Office of Management and Budget (OMB) to produce the surveys.[34] The questionnaires for both needs assessment surveys ask about water utilities' infrastructure needs, including those assets that are in need of replacement or rehabilitation. EPA officials said that they accept certain documents as support for the states' cost information, including SRF loan applications, capital improvement plans,[35] and asset management plans. To support their reported infrastructure needs, some water utilities submitted documentation that showed the use of asset management practices, according to the results of the 2011 drinking water needs assessment survey, and other utilities' supporting documentation illustrated continuing gaps in knowledge about the condition and remaining useful life of their infrastructure.[36] The results of the 2008 clean water needs assessment survey also highlighted water utilities' use of asset management and featured examples of states that used asset management practices to determine the costs of projects submitted to EPA.[37]

[34]EPA's needs assessment surveys are subject to federal law regarding the collection of information. Under the Paperwork Reduction Act of 1980, a federal agency must, among other things, submit for the approval of the OMB any proposal to collect the same information from 10 or more members of the public. The federal agency seeking approval must describe the information the agency seeks to collect from the public, the reason the information is needed, and estimates of the burden—the time, effort, and cost—imposed on the public to provide the information.

[35]According to EPA's website, a capital improvement plan assesses which projects (including asset improvements, repairs, replacements and such) need to be completed in the future.

[36]EPA, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*.

[37]EPA, *Clean Watersheds Needs Survey 2008: Report to Congress*. EPA's 2012 *Clean Watersheds Needs Survey* did not make statements about asset management.

Small Water Utilities in Selected States Are Implementing Some Asset Management Practices, and EPA, USDA, and State Officials Have Identified Benefits and Challenges

The small water utilities we interviewed in our sample of 10 states are implementing some asset management practices, and the state SRF officials we interviewed in these states said that large water utilities are more likely to implement asset management practices than small water utilities. EPA, state SRF, and USDA officials in our review identified benefits that could result from water utilities' use of asset management practices, as well as challenges water utilities face in implementing them.

Small Water Utilities in Selected States Are Implementing Some Asset Management Practices

Officials we interviewed from small water utilities in the selected states said that they are implementing some asset management practices, and state SRF program officials in these selected states indicated that large utilities are generally more likely to implement asset management. Officials we interviewed at the 25 small water utilities we selected for our review generally told us they were implementing some of the asset management practices EPA identified in its 2008 asset management best practices guide, but we found differences in the extent to which these small water utility officials were implementing these practices. We discuss what we found using EPA's framework, which consists of the five components and a written asset management plan.

- **Current state of assets**. EPA's 2008 best practices guide states that water utilities, in assessing the current state of their assets, should know what assets they own, what condition they are in, and their remaining useful life—that is, how much longer the water utility expects their assets to last. EPA recommends that water utilities (1) compile this information into an asset inventory that lists each asset's age, condition, service history, and remaining useful life and (2) develop maps that identify the location of these assets. Officials we interviewed from 8 of 25 of the small water utilities we reviewed in the selected states told us they had an inventory listing all of their assets, and 19 of 25 told us they had an inventory that listed at least some of their assets. Of the 8 small water utilities that had complete asset inventories, 2 of 8 included information on each asset's physical condition, and 3 of 8 included an estimate of each asset's remaining

useful life, according to the officials we interviewed with these utilities. These officials described various types of inventories, ranging from a list of assets included on insurance documents to a software program that included information about the assets' age, condition, service history, and remaining useful life. Officials at almost all (23 of 25) of the small water utilities in the selected states told us they had maps that identify the location of at least some of their assets. These officials described a range in the types of maps used by their water utilities, including one official who described using maps dating back to the 1980s, but others described using maps generated with a geographic information system (GIS) to locate a water utility's assets.[38]

- **Level of service.** EPA's 2008 best practices guide states that water utility operators need to know the level of service they will provide—that is, (1) what customers and stakeholders demand, (2) what regulators require, and (3) what operators need to know about the actual performance and capabilities of the water utility itself. According to EPA's 2008 guide, water utilities should also set performance goals related to these three facets of service. Officials at (1) 11 of 25 of the small water utilities in the selected states told us they had performance goals related to customer demand, (2) 19 of 25 said they had performance goals related to meeting EPA and state regulations, and (3) 17 of 25 said they had performance goals related to the actual performance of the system. For example, at a small water utility, an official responsible for managing the community's water utilities described setting goals to control the loss of treated drinking water from leaky distribution pipes and the loss of untreated wastewater through leaks in the sewer system. According to EPA's website, leaks in sewer systems can result in sewage overflows, increasing the quantity of water requiring treatment—which, in turn, can increase a wastewater utility's costs and present public health and environmental risks. The official told us that the water utility compares the amount of water that the drinking water utility produces to the amount of water used by customers, as indicated by their individual water meters, to ensure that no more than 20 percent of the water is lost through leaky distribution pipes. Additionally, this official described comparing drinking water

[38]GIS are systems of computer software, hardware, and data used to capture, store, manipulate, analyze, and graphically present a potentially wide array of geospatial data. The primary function of a GIS is to link multiple sets of geospatial data and display the combined information as maps with different layers of information.

production to flows from the town's sanitary sewer and wastewater treatment plant to ensure that these overall flows are neither too high nor too low and no less than 90 percent of the community's drinking water eventually makes it to the wastewater utility for treatment. Other officials we interviewed in the selected states described a range of goals, some of which did not relate to asset management. For example, some officials told us that their goals related to customer demand were to simply keep the water utility operating or to meet peak customer demand.

- **Critical assets**. EPA's 2008 best practices guide states that water utilities need to know which assets are the most critical to sustaining the water utility's operations, their risk of failing, and the consequences if they do fail. Officials from 18 of 25 of the small water utilities in our selected states told us they had identified their water utility's critical assets, but officials from 11 of 25 of those utilities said they have assessed the probability of failure for every critical asset. Officials we interviewed in 15 of 25 of the utilities in the selected states told us that, generally, the likelihood and consequences of failure for assets informed their decisions about which infrastructure projects to fund. Officials we interviewed in the selected states described taking a range of approaches to identify and assess their critical assets. For example, an official from one small water utility described the process of identifying and assigning a score (i.e., minor, major, or catastrophic) to each critical asset based on the impact that asset's failure would have on the environment and customer needs. An official with another small water utility described having enough experience with the water utility to keep mental notes about which assets were critical to the water utility's operations, and another official described using an online, computer-based system to operate critical assets remotely to monitor the probability of failure.

- **Minimum life-cycle cost**. EPA's 2008 best practices guide states that asset management enables a water utility to determine the minimum life-cycle cost—that is, the lowest cost options for providing the highest level of service over the lifetime of an asset. According to the guide, water utilities can achieve this by scheduling operations and maintenance based on the condition of assets; knowing the costs to repair, rehabilitate, and replace assets; and having specific response plans in case assets fail. Officials from 19 of the 25 small water utilities we reviewed in the selected states told us they conduct regular maintenance, but officials from 9 of 25 said they knew the cost of rehabilitation versus the cost of replacement for all water utility's assets. For example, one official said that the water utility had not

determined the costs of rehabilitation versus replacement because the assets were too old to be considered for rehabilitation. Additionally, officials from 15 of the 25 small water utilities in our selected states had written plans that describe their water utility's response in the case of asset failure. Concerning written plans to address asset failure, one official described a plan outlining discrete protocols the water utility should take to address asset failures or emergencies, but another official described a list of individuals or repair companies the water utility should notify when an asset fails.

- **Long-term funding plan.** EPA's 2008 best practices guide states that asset management activities related to developing long-term funding plans involve determining whether the water utility has enough funding to maintain its assets based on the required level of service (i.e., customer demands, regulatory requirements, and the capability of the utility's assets) and whether the user rates are sufficient for the water utility's long-term needs. EPA's 2011 report on the characteristics of small water utilities described communities and water utilities as generally separating funds by routine operations and maintenance and capital improvements and that they may also have an emergency fund or reserve fund earmarked for a specific purpose.[39] Officials at 19 of the 25 small water utilities in the selected states told us they had established a reserve fund to cover the cost of short-lived assets,[40] but officials at 11 of the 25 small water utilities told us they had enough funds to cover their water utility's long-term capital infrastructure needs. For example, an official from one small water utility described using a two-tiered rate structure consisting of a monthly water usage rate and a depreciation fee. This official said that the water utility uses the monthly rate to cover operations and maintenance and short-term capital infrastructure costs and sets the depreciation fee aside to fund long-term capital infrastructure costs. Other officials from small utilities described a range of approaches to planning for the long-term. For example, some small water utility officials told us that the water utility established separate reserves for short- and long-term capital investment needs, but an official from one small water utility described establishing a general surplus account into which the water utility put any surplus funds available at the end of the year for repairs and replacement.

[39]Environmental Protection Agency, EPA 816-R-10-022.

[40]USDA defines short-lived assets as those with an estimated useful life of 15 years or less.

- **Asset management programs and plans.** According to EPA's 2008 best practices guide, asset management is implemented through an asset management program and typically includes a written asset management plan. Officials at the small water utilities we interviewed said that they are implementing asset management practices as a routine course of business rather than a concerted effort to implement a formal asset management program or plan. Therefore, officials at 5 of the 25 small water utilities in the selected states said that they had a written asset management plan.

The small utilities in our selected states were implementing some asset management practices, but officials we interviewed with 9 of the 10 state SRF programs in our selected states told us that, generally, the large water utilities in their states were more likely than small water utilities to implement asset management.[41] Similarly, a 2013 market research study by McGraw-Hill Construction found that larger water utilities were more frequently implementing asset management practices than smaller water utilities.[42] Officials from the large utility we interviewed in Maine and the large utility we interviewed in New Mexico said they were implementing what they considered as comprehensive asset management practices, that is, practices as outlined in all five components of EPA's framework. For example, officials from a large water utility in Maine said that it had a performance goal for the district's fire hydrants related to the level of service provided to customers—that is, all fire hydrants would be in working order and would not spend more than 3 days out of service. These officials said that the inspections of the fire hydrants were electronically tied to the asset management software, which allows the water utility's managers to monitor the status of the inspections and track progress related to the performance goal.

[41]Officials in one state told us that the large water utilities in their state were as likely as small water utilities to implement asset management.

[42]McGraw-Hill Construction's study defined a "small utility" as one serving less than 50,000 people and did not include water utilities serving populations of fewer than 3,300.

EPA, USDA, and State Officials Identified Benefits Resulting from Water Utilities' Use of Asset Management Practices and Challenges in Implementing Such Practices

EPA and USDA headquarters officials and state SRF and USDA officials cited benefits for both water utilities and federal agencies resulting from water utilities' use of asset management practices. They also cited challenges for water utilities—particularly small water utilities—in implementing asset management practices, particularly the costs of implementing such practices.

Benefits

EPA and USDA headquarters officials and state SRF and USDA officials cited benefits for water utilities that implement asset management, including: (1) cost savings for water utilities that prolong the useful life of their assets and avoid costly emergency repairs, (2) more efficient, focused long-term planning of management and operations, and (3) improved financial health for water utilities. They also cited benefits for federal agencies.

Cost savings. EPA headquarters and state SRF and USDA officials told us that water utilities implementing asset management can experience cost savings by prolonging the useful life of the assets they already own through preventive maintenance, including pipe lining and repair, and deferring replacement costs. EPA's guidance states that preventive maintenance can help water utilities avoid unnecessary additional costs. Officials in our review provided the following examples:

- An official from one small water utility in Maine told us that the process of creating an asset inventory helped the water utility identify assets they did not know they owned and therefore had not maintained. This official also told us that the utility's use of asset management helped utility staff assess the condition of the utility's assets and implement a regular preventive maintenance schedule to maintain those assets. According to the official, this helped the utility avoid larger replacement costs, but he could not estimate the amount of savings.

- Another official with a small water utility in Idaho told us that the utility used asset management to plan the maintenance and repair of its drinking water reservoir and fire hydrants, which extended their useful life and resulted in cost savings.

- Another official with a small water utility in Maine told us that the utility assessed the condition of its sewer lines and realized that hydrogen sulfide —a result of the type of materials used to construct the pipes—had built up and put several lines at risk of collapsing. The official said the utility spent $12,000 to remove the hydrogen sulfide and prevented the collapse.

More efficient and focused long-term planning of operations and management. State SRF and USDA officials said that water utilities implementing asset management can plan more efficiently for the long-term, such as planning for capital investments, identifying changes in infrastructure needed as a result of population change, hiring or succession planning, improved emergency planning; and making decisions about repairs and replacements. The officials we interviewed highlighted the following examples:

- Officials at a small water utility in New Mexico told us that having an asset management plan allowed the utility to prioritize its capital investment needs, identify the associated costs, and determine what resources it would need going forward.

- An official with a small water utility in Arkansas told us that the utility used its asset management plan to assess the effect of a new housing development on its drinking water and wastewater infrastructure over the next 5 years. As a result of this assessment, the water utility was able to set connections and new user fees to recover the costs of adding the housing development without increasing water utility rates for existing residents.

- An official with a small water utility in Maine told us that because it identifies assets, maintenance schedules, and replacement schedules, creating an asset management plan was the best way for water utilities to transfer decades of knowledge retiring operators and maintenance staff had about the system. The official said that ensuring the continuity of operations and service to the community after employees retire provides some long-term planning.

Improved financial health. State SRF and USDA officials told us that water utilities implementing asset management can improve their financial health. EPA headquarters officials said that asset management can help water utilities better budget for capital investments and justify increases in user rates. Asset management also enables water utilities to better account for the value of their capital assets and asset depreciation, which can improve financial transparency and help the utilities with the

documentation needed for financial audits. The officials we interviewed highlighted the following examples:

- An official at a small water utility in Maine told us that the utility used its asset management plan to determine its financial needs, calculate a new user rate to meet these needs, and successfully justify raising rates to the water utility board and its customers.

- Another official at a small water utility in New Mexico told us that the water utility uses its asset management program to track its finances, including the depreciation of its assets—information that is typically reviewed as part of its financial audit.

Benefits to federal agencies. According to state SRF and USDA officials we interviewed, the federal agencies with programs that provide loans and grants to small water utilities to help fund capital infrastructure can also benefit from water utilities' use of asset management, as follows:

- State SRF and USDA officials said that a benefit of asset management, for lenders, is knowing that federal funds would be better targeted for infrastructure projects that address a community's greatest needs and knowing that the federal funds are paying for a project that the community could not afford on its own.

- EPA officials stated that increased use of asset management by small water utilities would improve the utilities' assessments of their capital needs, thereby improving the quality of the data collected for EPA's needs assessments. In addition, EPA officials we interviewed said that water utilities' use of asset management can result in more accurate information about infrastructure needs, such as costs, and better management of the funds spent on infrastructure repairs and replacement.[43]

Challenges

In addition to benefits, the state SRF and USDA officials we interviewed generally identified the following key challenges small water utilities face in implementing asset management:

- **Costs**. According to EPA's 2008 guidance on asset management for local officials, implementing an asset management program may

[43]Generally, "repairs" are defined as work going beyond normal maintenance and "replacement" is the substitution with a new or equivalent item.

include start-up costs. For example, SRF officials in one state told us that start-up costs are the largest costs for water utilities, often challenged with limited resources, in implementing asset management. According to state SRF and USDA officials, start-up costs can include (1) purchasing asset management tools, such as software or creating GIS maps, or (2) hiring an engineer or consultant to create an asset management program or plan on water utilities' behalf. For example, officials with two separate small water utilities in New Mexico told us that they spent $34,000 and $50,000, respectively, to hire a company to create GIS maps of the water utility's assets and officials with another small water utility in New Mexico told us that they paid an engineer $12,000 to develop an asset management plan.

- **Funding**. State SRF and USDA officials we interviewed said that small water utilities have difficulty obtaining funds or anticipate they will have difficulty obtaining funds to cover the start-up and maintenance costs associated with asset management. In describing challenges with funding asset management, for example, officials with a small water utility in New Mexico told us that the utility did not have the funds to pay an engineering firm to develop the needed additional GIS maps with the locations of their assets and would have to apply to a state infrastructure grant program for an additional $50,000.

- **Human resources**. According to the state SRF and USDA officials we interviewed, small water utilities do not have human resources to dedicate to asset management. For example, officials with a small water utility we visited in Maine said that, at the time of our review, the Maine Department of Transportation was completing a major road project in the state that affected the buried pipes for multiple communities, including the one in which this utility operated. These utility officials said that work on these pipes in addition to the routine day-to-day responsibilities of operating the utility left the small staff little time to work on asset management. Similarly, an official with another small water utility in Maine told us that one staff person was assigned to develop an inventory of the water utility's assets, and that finding the time was the greatest constraint to completing the inventory, coordinating with operations and maintenance staff, and implementing additional asset management practices.

- **Information**. Acquiring information about how to start or maintain an asset management program was another challenge for small utilities that state SRF and USDA officials cited. For example, officials with a small water utility in New Mexico said that the town leadership was

unaware of asset management prior to applying for an infrastructure loan through a state program. As a result, it took some time for the water utility operator and the utility's board to understand the asset management concept and implement the activities required as part of the state's loan program.

- **Political support.** According to some of the state SRF and USDA officials we interviewed, small water utilities are challenged with garnering and maintaining the political support of elected officials and the local community to begin or maintain an asset management program or increase user rates or expend funds on repairs as a result of implementing an asset management program. For example, an official with a small water utility said that the town's council was supportive of the recommendations the utility operator made regarding the likelihood of failure for assets and the need to address those assets before they failed. However, the town council did not always implement the recommendations because, among other things, they said they wanted to avoid having to raise user rates to cover the costs. An official with another water utility said that the water utility would benefit from raising user rates incrementally each year, but that elected officials do not want to raise rates, even minimally, because the community would not support such raises.

EPA and USDA Are Taking Steps to Help Small Utilities Implement Asset Management but Do Not Collect Information on Asset Management to Track Its Use or Compile Information on Costs and Benefits

EPA and USDA are taking steps to help small utilities implement asset management and address identified challenges that water utilities face. EPA and USDA recognize the benefits to water utilities and their loan programs and the need for water utilities, particularly small water utilities, to increase their use of asset management, but the agencies do not collect information on asset management that would enable them to track their efforts or compile information on costs and benefits that could be used to encourage wider use.

EPA and USDA Are Taking Steps to Help Small Water Utilities Implement Asset Management

EPA and USDA officials told us that they would like for as many water utilities as possible to increase their managerial and financial capacity, including the implementation of asset management. The officials said they are aware that small water utilities face challenges in implementing asset management and are taking steps to help them. To help small water utilities implement asset management, EPA and USDA provide funding for the development of asset management plans, free or low-cost tools such as software to develop asset management programs and plans, classroom training, and one-on-one technical assistance or coaching.

Funding

Both agencies provide funding for the development of asset management plans, helping to address the challenges of costs and funding. EPA provides funds that can be used for the development of asset management plans through grants to state drinking water SRF programs. According to state SRF officials in some of our selected states, these funds can help water utilities address challenges in finding the funds to cover the start-up costs of asset management activities. For example, officials with the Maine Drinking Water SRF program told us that the state SRF program uses its drinking water SRF funds[44] to pay up to 75 percent of the cost of developing an asset management plan for water utilities serving populations of fewer than 3,300 people and up to 50 percent for water utilities serving populations of more than 3,300 people. According to these officials, about 15 water utilities have applied for this funding between 2013 and 2015. State officials with the Delaware Drinking Water and Clean Water SRF programs, for example, told us that they recently started a new program providing grants to water utilities for funding activities leading to the development of an asset management plan. As of June 2015, the state had provided a grant ranging from $60,000 to $100,000 to each of the 4 publicly-owned water utilities that participated in the program.

State SRF officials in some of the 10 states in our review told us that in meeting state requirements for SRF loans,[45] small water utilities in their

[44]Subject to certain limitations states may use a portion of their drinking water SRF grants to fund various activities, including training, technical assistance and programs to develop technical, managerial, and financial capacity.

[45]The SRF programs are implemented by the states. While EPA establishes high-level requirements for the programs, states may impose additional or more specific requirements that differ by state.

states were engaging in some asset management practices.[46] State officials we interviewed provided examples, such as requiring (1) a report of the inventory and condition of the utility (or preliminary engineering report)[47] to show technical capacity; (2) a community to raise user rates to pay back the loan; or, (3) a community to set up a reserve fund to pay for short-lived assets. Officials we interviewed at 10 of the 25 small water utilities in the selected states said that they currently had an SRF loan.

USDA officials in the agency's headquarters and all 10 state offices we interviewed also told us that, as a result of their loan requirements,[48] small water utilities with USDA loans were engaging in some asset management practices. USDA headquarters officials told us that asset management is incorporated throughout their loan conditions. Specifically, USDA state officials said that they consider the following loan conditions to equate to asset management practices: requiring (1) a review of financial audits, (2) a preliminary engineering report, (3) a community to create a reserve to fund debt payments and cover the repair and replacement of short-lived assets, (4) development of an operations and maintenance manual, and (5) the restructuring of user rates to cover the cost of the loan and repair and replacement of short-lived assets. According to some USDA headquarters and state officials, USDA's state offices also conduct periodic (every 3 years) inspections of the condition of the facilities they fund once they are built. Officials we interviewed at 6 of the 25 small water utilities in the selected states said that they currently had a USDA loan.[49]

[46]Under the Safe Drinking Water Act (SDWA), states may not provide Drinking Water SRF loan assistance to systems that do not have the technical, managerial, and financial capability to ensure compliance with the SDWA unless the use of such assistance will ensure compliance, and the system has agreed to make the necessary changes in operation to ensure that it has the technical, managerial, and financial capacity to comply over the long term.

[47]A preliminary engineering report describes the proposed project, including its purpose, features of the proposed location, condition of any existing facilities, alternative approaches considered, design features, and costs. The report is prepared using a template.

[48]The Water and Waste Disposal program is implemented by USDA under federal regulations that apply to all states.

[49]Officials in 5 of the 25 small water utilities we interviewed said that they had both an SRF and USDA loan.

USDA officials said that their use of the preliminary engineering report is the key way in which the agency introduces its loan applicants to asset management. In 2013, USDA, in conjunction with EPA and other federal agencies and states, issued a preliminary engineering report template, a planning document that, in general, includes an inventory of the category of assets and assessment of the assets in the entire facility (e.g., the assets involved in the project being funded, a map of the assets in the water utility); information about the need for the project (including most critical aging infrastructure and future growth needs); and the costs for the repair, rehabilitation, and replacement of some assets. USDA regulations require loan applicants to submit a preliminary engineering report, and encourage applicants to consult agency guidelines in preparing the report.[50] In a 2013 bulletin to state officials, USDA encourages its state offices to use the preliminary engineering report template. EPA does not require SRF loan applicants to submit a preliminary engineering report, but like USDA, it encourages its use; specifically, it encourages state SRF programs to require its use.[51] EPA officials told us that as of October 2015, 10 state SRF programs had adopted the preliminary engineering report template and 10 other state SRF programs had adopted it and modified it by including additional requirements.

Free or Low-Cost Tools

Both agencies provide free or low-cost tools for developing asset management programs and plans to help address the challenges of cost and providing information. EPA provides a free asset management software program, and both EPA and USDA provide free tools such as guidebooks, case studies, and other written materials for small water utilities on the agencies' websites. EPA's free software program, Check Up Program for Small Systems (CUPSS), allows water utilities to develop asset management programs and plans. EPA officials told us that the original development of CUPSS was funded with SRF funds. Users of CUPSS can enter data into the system to develop an inventory of assets, record information to track the scheduling of maintenance tasks, and produce a written asset management plan. EPA officials told us that, with CUPSS, water utility managers can produce a report specifically communicating the condition of the water utility's assets to elected officials. EPA also provides free training on how to use CUPSS. The

[50] 7 C.F.R. §§ 1780.33, 1780.55 (2015).

[51] According to an EPA official, the intent of the SRF program is to provide states with flexibility in implementing their SRF programs.

availability of CUPSS also allows utilities to avoid some of the costs they would incur if they were to hire a professional engineering firm to do the same work. For example, an official with a small water utility we interviewed said that he did not incur any monetary costs to implement asset management because he used CUPSS to develop his asset management plan and program.

Classroom Training

EPA, USDA, and state SRF programs provide classroom training on asset management to help provide information to operators and other staff about how to implement asset management.

- EPA's Environmental Finance Center (EFC) [52] at the University of North Carolina at Chapel Hill leads the Smart Management for Small Water Systems project that provides 1-day workshops for operators of water utilities on various aspects of managing a water utility. According to an official with the EFC at the University of North Carolina at Chapel Hill, the EFC partners with other EFCs (including the University of New Mexico and Wichita State University) to conduct the workshops, which include a discussion of asset management. As stated on the website for the EFC at the University of North Carolina at Chapel Hill, from 2012 to 2014, these EFCs held more than 100 workshops, with 2,000 participants, in all 50 states and four U.S. territories.

- According to USDA headquarters officials, operators of small water utilities and their elected officials participate in financial and managerial training courses provided by organizations, such as the National Rural Water Association,[53] Rural Community Assistance Partnership,[54] and others. According to these officials, these training

[52]EPA provides grants through its EFC Grant Program to selected public and private universities or colleges and nonprofit organizations to provide technical assistance to communities on a range of EPA priorities, including improving financial capacity. This assistance includes studies of user rates for water utilities, one-on-one technical assistance, workshops and other classroom trainings, and written guidance. For fiscal years 2016 through 2021, EPA will provide grants to nine EFCs that serve 9 of its 10 regions.

[53]The National Rural Water Association is a nonprofit organization dedicated to training, supporting, and promoting the water and wastewater professionals that serve small communities across the United States.

[54]The Rural Community Assistance Partnership is a federally-funded network of nonprofit organizations that provide training, technical assistance, and other resources related to water and wastewater issues for small, rural communities and tribes. Most of its project communities are economically disadvantaged and have a population under 2,500.

sessions can include asset management. An official with the National Rural Water Association told us that the organization's training sessions generally include a component of asset management. Officials with the Rural Community Assistance Partnership told us that their organization provides workshops specifically on implementing asset management, including workshops for elected officials.

- EPA and USDA officials told us that the agencies' key collaborative effort is a workshop on water utility management, with the goal of helping to increase water utilities' managerial and financial capacity. The workshop, based on a 2013 EPA and USDA document entitled *Rural and Small Systems Guidebook to Sustainable Utility Management*,[55] describes 10 steps in effectively managing a water utility. EPA and USDA officials said that asset management is discussed as part of 1 of the 10 steps. EPA and USDA's guidebook defines the steps, describes challenges water utilities may face related to the steps and the effects of those challenges, and describes the types of actions taken by high-performing water utilities to address the challenges. The workshop materials focus primarily on the logistics of implementing a workshop. EPA and USDA train technical assistance providers to conduct the workshop for water utilities. Both agencies also provide free materials for the workshop on their websites. A 2015 EPA and USDA report[56] stated that the agencies had trained1,600 persons in workshops across the United States since 2013. EPA agreed with our estimate that the two agencies, together, train about 250 water utilities per year. USDA officials told us that for fiscal year 2015, the agency provided a grant to a technical assistance provider to provide two workshops in each of the 50 states. EPA funds this effort through its Small Systems Training and Technical Assistance Grants program, and USDA funds this effort through its Water & Waste Disposal Technical Assistance & Training Grants program.

- State SRF programs also use some of their federal funds to provide classroom training, for small water utilities, on a variety of topics related to building small water utilities' managerial and financial

[55]EPA and USDA, *Rural and Small Systems Guidebook to Sustainable Utility Management,* (Washington, D.C.: 2013). According to EPA and USDA officials and EPA's website, the guidebook is adapted from another guidebook and training course, "Effective Utility Management," designed for medium to large utilities.

[56]USDA and EPA, *Making A Difference for Rural and Small Utilities: Sustainable Rural and Small Utility Management Initiative*, (Washington, D.C.: 2015).

capacity, including asset management. For example, according to Maine Drinking Water SRF officials, Maine's Drinking Water SRF program provided four $25,000 grants to a local technical assistance provider to train operators of small water utilities and their elected officials on asset management.

This classroom training provides water utilities with education and information about asset management and how to implement an asset management program.

One-on-One Technical Assistance or Coaching

Both agencies also provide one-on-one technical assistance or coaching on asset management, which helps address the challenges of costs, funding, and providing information. EPA, USDA, and state SRF programs work with many of the same organizations to provide technical assistance services in their states. EPA also reaches small water utilities through its EFCs. The two primary organizations with whom EPA and USDA work to reach small water utilities are the National Rural Water Association and Rural Community Assistance Partnership. EPA and USDA officials have said that their contracts for technical assistance with these two providers are not exclusively for asset management, but that technical assistance providers are trained to and frequently help water utilities implement asset management and develop asset management plans. In conjunction with its workshop on sustainable utility management, EPA and USDA officials told us that technical assistance providers, in their workshops, also conduct follow-up calls to workshop participants and, if necessary, provide one-on-one assistance. The availability of one-on-one technical assistance also allows water utilities to avoid some of the costs they would incur if they were to hire a professional engineering firm to do the same work. For example, an operator with a small water utility in Maine told us that the utility developed its asset management program and plan through CUPSS with the free help of an organization contracted with EPA and USDA to provide technical assistance. This operator said the water utility's asset management program would not have been developed without this technical assistance.

EPA and USDA Do Not Collect Information on Asset Management to Track Their Efforts or Compile Information on Costs and Benefits to Encourage Wider Use

EPA and USDA recognize the benefits of asset management to water utilities and their loan programs and the need for water utilities, particularly small water utilities, to increase their use of asset management. Both agencies—EPA since 2003 and USDA since 2011—have identified asset management as a tool that water utilities can use to increase their ability to address infrastructure needs. In their 2011 memorandum of agreement, EPA and USDA agreed to collaborate in promoting ways that small water utilities can better manage their infrastructure needs and highlighted the use of asset management to ensure long-term technical, managerial, and financial capacity. EPA and USDA agreed to coordinate agency activities and financial assistance in areas that would increase the technical, managerial, and financial capacity of small water utilities. The memorandum also stated that EPA and USDA would encourage communities to implement system-wide planning, including asset management, and that the two agencies would share and distribute resources to water utilities and provide training and information. EPA and USDA officials told us that they want their efforts to result in as many water utilities as possible increasing their managerial and financial capacity, including the use of asset management. However, even though EPA and USDA promote sustainable water infrastructure, and the agencies encourage water utilities to better manage their resources to address the long-term challenges posed by deteriorating infrastructure, limited funds, and declining populations, they do not—and are not required to—collect information on utilities' use of asset management. Specifically, they do not collect information that tracks the results of their training efforts on utilities' use of asset management practices or compile information on the benefits and costs of implementing asset management.

First, EPA and USDA do not collect information that tracks the results of the agencies' training efforts (e.g., whether participating utilities use asset management practices). EPA stated in a 2011 policy document describing its plans to promote sustainable water infrastructure that the agency has an interest in tracking the results of the agency's training. This is consistent with our January 2004 report on selected agencies' experiences and lessons learned in designing training and development programs and our March 2004 guide on assessing strategic training and development efforts for human capital,[57] in which we reported that evaluating

[57] GAO-04-291 and GAO-04-546G.

training programs is key to ensuring that training is effective in contributing to the accomplishment of agency goals and objectives. It is also consistent with our September 2005 report on enhancing performance management, which states that information can be used to make decisions that affect future strategies, planning and budgeting, identifying priorities, and allocating resources.[58]

Both EPA and USDA collect some information from the water utilities that participate in classroom training or receive one-on-one technical assistance; however, the agencies do not collect information that may allow them to better measure the results of their efforts to assist utilities. EPA collects information on the number of utilities that have taken training per year and reports this as part of its major performance goals. For example, as stated above, since 2011, 250 small utilities per year have taken the EPA and USDA trainings (of the 68,000 utilities nationwide). In addition, both EPA and USDA collect feedback from water utilities on their experience in training. For example, the agencies collect feedback forms from those attending the training to determine how to improve it. However, the information EPA collects does not show whether the water utilities that receive training from the agencies went on to incorporate asset management practices into their work processes or whether these water utilities have improved their managerial or financial capacity.

EPA and USDA officials said that information on water utilities' use and incorporation of asset management would help EPA and USDA understand how the training and technical assistance they provide are affecting utilities' use of asset management. EPA officials said that they would like to collect data on water utilities' incorporation of asset management and determine whether these water utilities have improved their managerial or financial capacity, but they do not have the resources to do so. An EPA official said that when the agency was considering a nationwide study in 2006, the agency wanted to study the incorporation, costs, and benefits, of water utilities' use of asset management. However, EPA found that the costs of such a data collection effort would be in the hundreds of thousands of dollars. In particular, according to an EPA official, in addition to the costs of collecting the data from water utilities, the agency would also face costs in submitting the required Information Collection Request proposal to OMB. USDA officials similarly stated that

[58]GAO-05-927.

they would be interested in collecting data on how the water utilities that participate in their sustainability workshops incorporated asset management or other management practices into their work processes. However, a USDA official told us that the agency would have to explore whether it could do a study such as this.

Leveraging existing data collection methods to collect information, such as adding questions to existing information collection requests, could be a cost-effective option for EPA and USDA to obtain information on water utilities' use of asset management. In particular, EPA's drinking water and clean water infrastructure needs assessment surveys provide national data on water utilities' infrastructure repair, rehabilitation, and replacement needs. EPA officials said that EPA works in partnership with states to obtain the data, and it works with state officials to convey the importance of the surveys. This work includes discussing the types of questions in the surveys, including any additional policy areas the questions will cover. EPA officials told us that the agency can add questions to the needs assessment surveys and has done so in the past on such policy issues as climate change and energy efficiency; the officials said that few states have responded to the questions, however, because participation by the states and water utilities is voluntary, and states are not required to answer all of the questions in the surveys.

EPA officials said that the agency included questions about asset management in the clean water needs assessment survey in 2008 and 2012. Specifically, these officials said, the questions asked water utilities to identify the status of their implementation of asset management and related costs. According to these officials, the agency did not receive enough responses to analyze and include the data in the final reports. EPA officials representing the clean water needs assessment survey said that they would be open to more discussions with states about asset management given their increased awareness. An EPA official that works with the drinking water needs assessment survey told us that EPA has not systematically asked questions about asset management in the drinking water needs assessments survey because the agency has determined that its efforts are best focused on asking questions required to determine infrastructure needs and for which the agency is likely to receive a large response from the states. In addition, this official said that EPA encourages water utilities to implement asset management practices through its guidance to states about the types of information the agency will accept as support for responses to the survey. An EPA official said that the agency has not considered or determined what asset management questions it might ask on the drinking water needs

assessment survey. By continuing to include questions on the clean water needs assessment and considering questions about water utilities' use of asset management to include in the drinking water needs assessment survey, EPA may have better assurance that it is collecting information in a cost-effective way to assess the effectiveness of its asset management training efforts with USDA. The EPA official representing the drinking water needs assessment survey said that there would be value for the agency in asking water utilities about asset management.

Second, EPA and USDA do not collect information on the benefits and costs of using and implementing asset management to encourage use. EPA and USDA do not—and are not required to—compile information on the benefits and costs of implementing asset management to encourage small utilities to use it. EPA and USDA officials stated that increasing water and wastewater utilities' use of asset management increases the utilities' managerial and financial capacity and, for this reason, EPA and USDA (through technical assistance providers) share anecdotal data to encourage water utilities to adopt asset management. In particular, these officials said that they promote managerial and financial capacity building trainings, which include asset management training, by attending conferences at which they present to water utility officials, provide one-on-one technical assistance outreach, and engage in conversations with state SRF and USDA officials. EPA also provides some information about the potential benefits of asset management in documents available on its website. For example, EPA's 2008 best practices guide provides a list of the benefits of using asset management.

EPA and USDA's training materials for their workshops on *Rural and Small Systems Guidebook to Sustainable Utility Management* include examples of management challenges and best practices— many of which are asset management practices—to address the challenges. The training materials do not, however, include cases showing communities' use of asset management and the resulting benefits, including the costs that could result from implementing these best practices. According to an EPA official, most of the information on benefits, including cost savings, and costs comes from specific anecdotes and materials that technical assistance providers have developed and conveyed through their individual training and interactions with water utilities' staff or governing bodies. Some of EPA's technical assistance providers, such as the EFCs, have used information on the benefits of asset management to encourage water utility board members and city councils to adopt asset management.

However, the agencies have not compiled information about the benefits and costs of asset management into a single document that is more broadly available to water utilities. EPA and USDA officials told us that they had not considered compiling information about the benefits of asset management into one source, and they are not required to. However, providing information on benefits and costs to those who have not attended the agencies' trainings could help encourage them to adopt asset management practices. We noted in a September 2002 report that agencies use information dissemination as one of several tools to achieve goals for programs in which agencies do not act directly, but inform and persuade others to act to achieve a desired outcome.[59] Additionally, in a September 2005 report, we reported that agencies can evaluate their efforts using fact-based understandings of how their activities contribute to accomplishing the mission and broader results and to identify and increase the use of program approaches that are working well.[60] In this same report, we stated that agencies can adopt a number of practices to enhance the usefulness of information. One of these best practices for improving the use of information is to ensure that it is, among other things, relevant, accessible, and easy to use. For example, in 2006, EPA and the Federal Highway Administration collaboratively conducted a case study review of communities' experiences, including the benefits, of implementing asset management across multiple infrastructure sectors such as water, wastewater, and transportation.[61] According to the study, the purpose of the review was to provide, in one resource, relevant examples of how communities were responding to their infrastructure needs by using asset management practices.

An EPA official told us that, in 2006, the agency considered compiling information on cost savings by asking a question in a potential nationwide study of water utilities' use of asset management but did not pursue this study because, among other things, the agency did not have the resources to pay for it at that time. This official told us that EPA has instead engaged in activities that cost less than a nationwide study, such as developing case studies or other small-scale information collection efforts. A USDA official said that the agency would be open to exploring

[59]GAO-02-923.

[60]GAO-05-927, 15.

[61]Environmental Protection Agency and Department of Transportation, Federal Highway Administration, *Multisector Asset Management Case Studies* (Washington, D.C.).

ways to collaborate on a study of the benefits and costs of asset management for small water utilities. As shown by the EPA and Federal Highway Administration study, EPA provided useful examples of the benefits for entities considering asset management by compiling and making broadly available information about the benefits and costs of asset management. Consistent with best practices for using performance information, compiling the information that EPA and USDA technical assistance providers share with water and wastewater utilities to document the benefits and costs of asset management could provide a resource for a broader audience of small water utilities that are considering using this approach. Both EPA and USDA officials said that they had developed several materials for small water utilities through their coordinated efforts and that a compilation of existing cases and examples of communities' use of asset management, its benefits, including cost savings, and costs could be useful in persuading some water utilities to use asset management.

Conclusions

EPA and USDA have provided millions of dollars of federal funding to help small water utilities increase their technical, managerial, and financial capacity to better meet the challenge of repairing and replacing the nation's aging water infrastructure and, also, provide safe and clean water to communities. Both agencies have identified asset management as a tool that water utilities can use to increase their ability to address current and future infrastructure needs.

EPA and USDA have played a significant role in encouraging and helping water utilities to implement asset management through funding conditions, training, and other resources. With 68,000 water utilities across the country, it is important to know which are using asset management and which are not. However, EPA and USDA do not collect information on water utilities' use of asset management, particularly from utilities that have taken part in agency training sessions on asset management. Existing data collection efforts such as EPA's needs assessment surveys may be a cost-effective means of doing this. By continuing to include questions in the clean water needs assessment survey and considering questions about water utilities' use of asset management to include in the drinking water needs assessment survey, EPA may have better assurance that it is collecting information in a cost-effective way to assess the results of its asset management training efforts with USDA. In addition, persuading elected officials and communities of the need for infrastructure investment is important, as is the need to use asset management to make investment decisions. EPA

and USDA share the benefits and costs of asset management in various documents provided on their websites and through technical assistance providers. However, the agencies have not compiled the information on the benefits and costs of asset management, particularly the cost savings, into one source. A documented compilation of the benefits and costs of asset management, including the cost savings, consistent with performance management best practices, that is widely available to water utilities, may be helpful to EPA and USDA in encouraging a broader audience of small water utilities to consider adopting asset management.

Recommendations for Executive Action

As EPA and USDA continue to consider ways to track and promote water utilities' implementation of asset management, we recommend the following:

- First, that the Administrator of EPA direct the Office of Groundwater and Drinking Water and Office of Wastewater Management to continue to include questions on water utilities' use of asset management in the clean water needs assessment and consider including questions about water utilities' use of asset management in future drinking water infrastructure needs assessment surveys.

- Second, that the Administrator of EPA, and the Secretary of USDA, through the Rural Development Agency, consider compiling into one document the existing cases and examples of the benefits and costs of asset management and widely share this information with water utilities.

Agency Comments and Our Evaluation

We provided the Administrator of EPA and the Secretary of USDA with a draft of this report for review and comment. In written comments provided by EPA (reproduced in app. IV), EPA generally agreed with our findings and recommendations. In addition, in an e-mail received from the GAO and OIG Liaison Officer within USDA's Rural Development agency, USDA agreed with our report.

In response to our recommendation that EPA continue to include questions on water utilities' use of asset management in the clean water needs assessment and consider including such questions in future drinking water infrastructure needs assessment surveys, EPA included "a significant caveat" to its agreement. Specifically, EPA's comments stated that the agency generally agrees with the recommendation, with the significant caveat that the method for continuing to assess the effectiveness of the agency's asset management training and technical

assistance must be both effective and efficient. It further stated that although the agency has included asset management questions as part of the needs assessment surveys in the past, this mechanism has led to limited information regarding the level of implementation of asset management at utilities. Further, the comments stated that the needs assessment survey may not be the most efficient and effective way to collect these data since the survey's primary focus and design is to assess and quantify the nation's infrastructure need and not the adequate implementation of asset management. EPA stated that it would be willing to explore other means of obtaining data that would provide an indication of how utilities are benefitting from the agency's asset management training and technical assistance. We continue to consider the needs assessment survey to be a cost-effective and efficient method for collecting data from water utilities. If EPA explores others approaches and finds that the information can be systematically collected from the nation's water utilities for comparison over time, we agree other approaches could be appropriate.

In response to our recommendation that EPA and USDA consider compiling, and widely share, existing cases and examples of the benefits and costs of asset management, EPA noted that it agrees that it is important to educate utilities on the benefits of asset management in protecting the nation's infrastructure investment and described steps it has taken to do so. EPA stated that, as funding and resources allow, the agency would most likely consider the development of a case study compilation document focused on local decision makers who are key to ensuring that asset management is a priority and is implemented appropriately. We agree that focusing on local decision makers is important and believe that a document compiling case studies could be useful and made available to water utilities as well as local decision makers. USDA did not comment specifically on this recommendation and stated in its e-mail message that the agency will continue to emphasize asset management through its technical assistance providers funded through the agency's Technical Assistance and Grant program and joint EPA/USDA Work-Shop-in-a-Box initiative.

We are sending copies of this report to the appropriate congressional committees; the Administrator of EPA; the Secretary of Agriculture; the Director, Office of Management and Budget; and other interested parties. In addition, this report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or gomezj@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix V.

J. Alfredo Gómez
Director, Natural Resources and Environment

Appendix I: Requirements and Incentives for Asset Management

Federal law does not require water utilities to implement asset management. However, in 2014, federal law began requiring all recipients of Clean Water State Revolving Fund (SRF) loans for repair, replacement, or expansion of a water utility to develop fiscal sustainability plans.[1] According to the law, fiscal sustainability plans should include (1) an inventory of critical assets; (2) an evaluation of the condition and performance of such assets or groups of assets; and (3) a plan for maintaining, repairing, and, as necessary, replacing the utility and a plan for funding such activities. According to Environmental Protection Agency (EPA) officials, some of the activities required as part of the fiscal sustainability plan are asset management practices.

Officials in one state told us their state requires water utilities to develop asset management plans as a condition of SRF loans for water infrastructure, and officials in another state told us their state requires asset management plans for SRF loan forgiveness.[2] Other states may provide incentives during the application process. Specifically, states may award additional points in the application scoring process known as "priority points." Table 1 provides information about the requirements and incentives reported by officials in the states we reviewed.

[1]Water Resources Reform and Development Act of 2014, Pub. L. No. 113-121, § 5003, 128 Stat. 1193, 1323 (codified at 33 U.S.C. § 1383(d)(1)(E)(i) (2015).

[2]We interviewed state officials responsible for managing EPA's Drinking Water and Clean Water SRF programs as well as officials in USDA's state offices in a nonprobability sample of 10 states. To select these states, we used EPA's most recent needs assessment data (i.e., 2011 for drinking water infrastructure and 2008 for wastewater infrastructure) to identify the state in each of EPA's 10 regions with the highest percentage of small water utility needs. These states were: Arizona, Arkansas, Delaware, Idaho, Iowa, Minnesota, Mississippi, New York, Vermont, and Wyoming. See *EPA, Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, EPA 816-R-13-006 (Washington, D.C.: April 2013) and *Clean Watersheds Needs Survey 2008: Report to Congress*, EPA-832-R-10-002 (Washington, D.C.: May 2010). At the time of our state selection, EPA had not released its 2012 report.

Table 1: Reported Drinking Water and Clean Water SRF Asset Management Requirements and Incentives for the States We Reviewed

	Drinking Water SRF			Clean Water SRF		
State	Required	Required for loan forgiveness	Priority points	Required	Required for loan forgiveness	Priority points
Arizona	No	No	No	No	No	No
Arkansas	No	No	Yes	No	No	No
Delaware	No	No	No	No	No	Yes
Idaho	No	No	Yes	No	No	Yes
Iowa	No	No	No	No	No	No
Maine	No	No	No	No	Yes	No
Minnesota	No	No	No	No	No	No
Mississippi	No	No	No	No	No	No
New Mexico	No	No	Yes	Yes	No	Yes
New York	No	No	Yes	No	No	No
Wyoming	No	No	No	No	No	No
Vermont	No	No	Yes	No	No	No

Legend: Yes = State officials we interviewed told us the state program has a requirement or incentive for asset management programs and/or plans.
No = State officials we interviewed told us that the state does not have a requirement or incentive for asset management.

Sources: GAO analysis of interviews with state Drinking Water and Clean Water SRF officials. | GAO-16-237

Note: The states listed in this table are those states we included in our review. We did not ask water utilities about requirements for loan forgiveness in our interviews.

Appendix II: Objectives, Scope, and Methodology

This report examines selected water utilities' use of asset management. Our objectives were to examine (1) what is known about the use of asset management among the nation's water utilities—particularly small water utilities—including benefits and challenges, if any, for water utilities implementing asset management and (2) steps, if any, that the Environmental Protection Agency (EPA) and U.S. Department of Agriculture (USDA) are taking to help small water utilities implement asset management.

To examine what is known about water utilities' use of asset management, including benefits and challenges, if any, we used EPA's framework for asset management. The framework, from EPA's 2008 *Asset Management: A Best Practices Guide*,[1] describes five components and the practices that comprise asset management. The components and practices described in this document formed the basis of our interview questions. We also used other EPA documents describing the agency's asset management framework: 2003 *Asset Management: A Handbook for Small Water Systems: One of the Simple Tools for Effective Performance (STEP) Guide Series* [2] and 2008 *Building an Asset Management Team*[3]. This criterion remains relevant today because it is a federally-developed asset management framework for water utilities.

To determine if there were existing sources of information on the extent to which utilities use asset management, we interviewed EPA and USDA Rural Development staff about data each agency collects on water utilities' use of asset management, including any data on asset management collected by EPA in its national needs assessment surveys. We also interviewed representatives of national water and wastewater associations to identify potential data sources. Through this process, we identified one national study, a market research study conducted by McGraw-Hill Construction, a company that provides analytics, news, and intelligence for the North American construction industry, and CH2M, a

[1]Environmental Protection Agency, *Asset Management: A Best Practices Guide*, EPA 816-F-08-014 (Washington, D.C.: April 2008).

[2]Environmental Protection Agency, *Building an Asset Management Team*, EPA 816-F-08-016 (Washington, D.C.: April 2008).

[3]Environmental Protection Agency, *Asset Management: A Handbook for Small Water Systems: One of the Simple Tools for Effective Performance (STEP) Guide Series,* EPA 816-R-03-016, (Washington, D.C.: September 2003).

company that, among other things, provides consulting services related to asset management.[4] The report described the results of a survey of 451 persons representing water utilities in the United States and Canada and the extent to which they had adopted 14 asset management practices. Thirty percent of the 451 persons in the survey sample represented utilities providing only drinking water services and 70 percent represented utilities providing drinking water and wastewater services. The 14 practices included such actions as (1) the use of a computerized maintenance management system, (2) the use of an asset register to facilitate analysis and planning, (3) the development of customer service and asset service-level performance measures, and (4) consideration of risks and consequences of alternative investment/ budget decisions, but the report did not describe how the 14 practices were selected. The report also included information from confidential interviews with water utilities on their insights in implementing asset management. We reviewed the authors' description of the study's methodology and determined that the data were sufficient for the purpose of describing qualitative information to corroborate information we obtained from our interviews about large utilities' use of asset management because the study authors included asset management practices that were similar to those identified by EPA.

To understand the extent to which small utilities are using asset management, we conducted semistructured interviews with officials in a nonprobability sample of 10 states: Arizona, Arkansas, Delaware, Idaho, Iowa, Minnesota, Mississippi, New York, Vermont, and Wyoming. To select these 10 states, we identified the state in each of EPA's 10 regions with the highest percentage of small water utility needs, using EPA's most recent needs assessment data from the 2011 *Drinking Water Infrastructure Needs Survey and Assessment* and the 2008 *Clean Watersheds Needs Survey*.[5] EPA's 2011 *Drinking Water Infrastructure Needs Survey and Assessment* calculated the need among small water utilities serving fewer than 10,000 people for 35 of the 50 states. For the remaining 15 states, EPA provided data on small water utilities serving fewer than 3,300 people. We calculated the percentages of small water

[4]McGraw-Hill Construction, *Water Infrastructure Asset Management: Adopting Best Practices to Enable Better Investments: Smart Market Report* (Bedford, MA: 2013).

[5]Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, EPA 816-R-13-006 (Washington, D.C.: April 2013) and Environmental Protection Agency, *Clean Watersheds Needs Survey 2008: Report to Congress*, EPA-832-R-10-002 (Washington, D.C.: May 2010).

utilities' share of statewide need for these 15 states using this information. The 2008 *Clean Watersheds Needs Survey* calculated the need for small water utilities serving fewer than 10,000 people for 47 states, the District of Columbia, and U.S. territories. It did not report data for 3 states, Alaska, North Dakota, or Rhode Island. As a result, we did not include these states in the data we used for our selection.

In our sample of 10 states, we used a standard set of questions for conducting interviews, by telephone, with state drinking water and clean water State Revolving Fund (SRF) program officials and USDA state office staff. Our standard set of questions consisted of closed- and open-ended questions to ensure we consistently captured officials' responses. During these interviews, we asked officials to estimate the use of asset management practices by water utilities' in their state, the benefits for utilities and lenders of using asset management, the challenges small utilities experience in implementing asset management, funding and technical assistance for asset management available to water utilities in their state, and the asset management practices for which small utilities are most in need of technical assistance. In addition, we asked USDA officials about the loan conditions they consider to be asset management practices. We also specifically asked SRF officials about requirements for asset management practices or plans as a condition of SRF loans. In these interviews with officials representing state SRF programs, USDA state offices, and small water utilities, we did not receive answers to every close-ended question we asked; we note in the report the number of answers provided for each question. Because our sample of states was a nonprobability sample, responses from the officials we interviewed cannot be generalized to other states and their water utilities, but they illustrate some of the uses of asset management practices among small water utilities in states with the greatest infrastructure needs.

In addition to interviewing state SRF and USDA officials in the 10 selected states, we interviewed, by telephone, officials in a nongeneralizable, random sample of small drinking water and wastewater utilities serving populations of 10,000 or less. To select these small water utilities, we used two EPA databases of water utilities. To identify drinking water utilities, we used EPA's Safe Drinking Water Information System, a database of information about drinking water utilities and their regulatory violations. To identify wastewater utilities, we used a publicly available database of the water utilities included in the 2008 *Clean Watersheds Needs Survey*. We assessed the data reliability for both databases by, among other things, reviewing published documents and data regarding EPA's quality assurance and quality control procedures for the needs

survey assessment tools, contacting EPA officials to ensure we used the correct search fields and parameters, and reviewing past GAO reports and other documentation on the reliability of the data. Through these steps, we determined that the data were sufficiently reliable for our purposes of sampling drinking water and wastewater utilities in each of our 10 states. We selected a sample of 40 utilities, two drinking water and two wastewater utilities in each of the 10 selected states, and conducted interviews with at least one drinking water and one wastewater utility in 9 of the 10 states, for a total of 25 water utility interviews. (All of the water utilities we contacted in Mississippi declined to participate or did not respond to our interview requests.) To ensure our sample represented a range of small water utilities, we selected one drinking water utility serving a population of more than 500, but less than or equal to 10,000 and one drinking water utility serving a population of 500 or fewer people. Similarly, for each of the 10 states we selected one wastewater utility serving a population between 1,000 and 10,000 and one wastewater utility serving a population of less than 1,000 in each of the 10 selected states. In addition to the 40 utilities, we also generated a back-up list of randomly selected water utilities from which to choose if the utilities in the original sample declined to participate in our review or did not respond to our requests for an interview after three or more attempts. In total, we contacted 68 water utilities in all 10 of the states and conducted interviews with officials representing 25 water utilities in 9 states. Of these 25, 12 were drinking water utilities, and 13 were wastewater utilities. Table 2 provides a summary of the population served and ownership for the water utilities we interviewed in the 10 states.

Table 2: Water Utilities Interviewed in the 10 States, by Population Served and Ownership

	Population served	Number of utilities	Ownership	Number of utilities
Drinking water	Less than 500	5	Public	9
	501 to 10,000	7	Private	3
Wastewater	Less than 1,000	7	Public	13
	1,000 to 10,000	6	Private	0
Total	**n/a**	**25**	**n/a**	**25**

Source: GAO. | GAO-16-237

Our interviews with small water utilities consisted of a standard set of closed- and open-ended questions. Officials participating in these interviews were, for example, water utility operators or superintendents, maintenance staff, public works directors, elected city officials, water utility board members, and engineers. We asked about officials' familiarity with asset management as defined by EPA, the extent to which they were implementing asset management practices, and, if so, the costs and cost savings they had identified, whether water utility staff or governing officials had received technical assistance on asset management, and contextual background on the community in which they served. Because our sample of water utilities in the 10 selected states was a nongeneralizable sample, we do not use the data collected from these states to generalize about the use of asset management in other states and by other water utilities.

To analyze the open-ended questions in our surveys, we conducted several content analyses. Specifically, we conducted a content analysis to categorize the benefits (to water utilities and federal agencies) of asset management and the challenges small utilities face in implementing asset management practices. To identify categories in which to classify the open-ended responses, we examined the responses and used content analysis software to count the words officials used most frequently and identified broad groupings of concepts. We classified the responses to the open-ended questions on benefits to water utilities into the following categories: (1) planning, (2) financial, (3) awareness (of the system and assets), (4) management, (5) technical, (6) other benefits, and (7) unaware of benefits. We classified the responses to the open-ended questions on benefits to federal agencies into the following categories: (1) system and (2) lender. We classified the responses to the open-ended questions on challenges into the following categories: (1) financial, (2) human resources, (3) support, (4) education, and (5) other challenges. Where appropriate, we also identified subcategories to classify responses.

To conduct the content analysis of responses, two analysts independently assigned officials' responses to one or more categories and compared their analyses. All initial disagreements regarding the categorizations of officials' responses were discussed and reconciled. The analysts then tallied the number of responses in each category. We tabulated the responses from closed-ended questions counts. To characterize officials' views we identified throughout this report, we defined modifiers to quantify officials' views. For example, "most" represents instances in which at least one state official in more than five states provided a response. The modifiers are as follows:

For state SRF and USDA state offices in the 10 selected states,

- "most" represents state SRF and USDA officials in more than 5 states,
- "half" represents state SRF and USDA officials in 5 states, and
- "some" represents state SRF and USDA officials in less than 5 states.

We also conducted two in-person visits to Maine and New Mexico. We selected Maine and New Mexico based on recommendations from EPA and USDA officials in the agencies' headquarters, national water and wastewater associations, and technical assistance providers. In addition, we selected New Mexico because of the state's requirement that water utilities have an asset management plan as a condition of Clean Water SRF infrastructure funding. The officials that recommended Maine generally told us they did so because the state has long encouraged utilities to adopt asset management. During our visits to Maine and New Mexico, we interviewed a total of 12 small and large, public and private, water utilities. We selected these water utilities based on recommendations from state SRF officials and technical assistance providers in each state and, in the case of New Mexico, EPA regional office staff. Table 3 provides descriptive information about the water utilities we interviewed in Maine and New Mexico.

Table 3: Description of the Water Utilities Interviewed in Maine and New Mexico

	Name of utility	Utility type	Ownership type	Utility size	Population served
Maine	Farmington Water District	Drinking Water	Public	Small	4,050
	Portland Water District	Drinking Water	Public	Large	136,945
	Great Salt Bay Sanitary District	Wastewater	Public	Small	1,403
	Thomaston Pollution Control Department	Wastewater	Public	Small	2,562
	Ogunquit Sewer District	Wastewater	Public	Small	1,092
	City of Saco	Wastewater	Public	Small	7,810
New Mexico	Agua Sana User's Association	Drinking Water	Public	Small	1,200
	El Valle Water Alliance[a]	Drinking Water	Public	Small	1,732
	Rainsville Water and Sanitation District	Drinking Water and Wastewater	Public	Small	250
	Eldorado Area Water and Sanitation District	Drinking Water and Wastewater	Public	Small	7,350
	Albuquerque Bernalillo County Water Utility Authority	Drinking Water and Wastewater	Public	Large	601,983
	Entranosa Water and Wastewater Association	Drinking Water and Wastewater	Private	Small	8,500

Sources: GAO summary of in-person interviews, EPA's Safe Drinking Water Information System, and 2008 Clean Watersheds Needs Survey database and other water utility documents. | GAO-16-237

Note: Data for utility type and ownership type are from in-person interviews with officials at these utilities. Data on utility size and population served are from EPA's Safe Drinking Water Information System (drinking water utilities) and the database for the 2008 Clean Watersheds Needs Survey (wastewater utilities).

[a] El Valle Water Alliance is a consortium of 11 small water utilities, operating under one management structure.

To examine the steps, if any, that EPA and USDA have taken to help small water utilities implement asset management, we reviewed EPA and USDA guidance, reports, training materials, and software tools available on asset management. One particular guidance we used was the 2011 Memorandum of Agreement on *Promoting Sustainable Rural Water and Wastewater Systems*, which describes EPA's and USDA's joint efforts to promote the technical, managerial, and financial capacity of small utilities and includes an emphasis on promoting asset management.[6] We then interviewed EPA and USDA officials to understand the actions they have taken, the funds they have spent, and the efforts they have made to

[6]EPA and USDA, Memorandum of Agreement Between the United States Environmental Protection Agency and the United States Department of Agriculture-Rural Development Rural Utilities Service, *Promoting Sustainable Rural Water and Wastewater Systems* (Washington, D.C.: June, 2011).

coordinate on asset management activities. We also interviewed technical assistance providers funded by EPA and USDA to conduct trainings and one-on-one technical assistance on asset management. These technical assistance providers included the EPA-funded Environmental Finance Centers at the University of New Mexico, Wichita State University, Cleveland State University, and University of North Carolina at Chapel Hill and the National Rural Water Association and Rural Community Assistance Partnership's national offices and local affiliates in Maine and New Mexico. We compared the information we collected about the steps EPA and USDA have taken to key practices related to federal agencies' training efforts and collection and dissemination of information that we identified in previous reports.[7]

We conducted this performance audit from January 2015 to January 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[7]GAO-04-291, GAO-04-546G, GAO-05-927, and GAO-02-923.

Appendix III: Federal Funding for Asset Management

The Environmental Protection Agency (EPA) and the U.S. Department of Agriculture (USDA) have funded asset management activities through their existing programs and, more recently, used some of this funding for collaborative efforts. Specifically, EPA officials told us that they first began funding asset management activities through the Drinking Water State Revolving Fund (SRF) program when the 1996 amendments to the Safe Drinking Water Act authorized states to use a certain percentage of their grants for such programs. According to USDA officials, USDA has contracted with national organizations that incorporated asset management training as part of their work in assisting small water utilities in managing and operating their facilities. With the 2011 issuance of a memorandum of agreement on sustainable infrastructure, EPA and USDA agreed to collaborate on training and to coordinate agency activities and financial assistance in areas that would increase technical, managerial, and financial capacity, including through the use of asset management.[1] As a result, EPA and USDA spending on asset management activities falls under various larger programmatic areas.

EPA's spending falls into the following three categories:

- **Small Systems Training and Technical Assistance Grants.** EPA funds asset management activities through this grant program to improve technical, managerial, and financial capacity of small drinking water and wastewater utilities. In fiscal year 2014, EPA provided an estimated $13.1 million in grants to support training and technical assistance for small utilities. Of the estimated $13.1 million, about $3 million was used to provide training and technical assistance to water utilities to improve financial and managerial capacity, which included asset management.[2] In December 2015, legislation was enacted to reauthorize the small systems training and technical assistance grants program for $15 million per year for fiscal years 2015 through 2020.[3]

[1]EPA and USDA, Memorandum of Agreement Between the United States Environmental Protection Agency and the United States Department of Agriculture-Rural Development Rural Utilities Service, *Promoting Sustainable Rural Water and Wastewater Systems* (Washington, D.C.: June, 2011).

[2]According to an EPA document summarizing the grant program and fiscal year 2014 awards, the remaining estimated $10.1 million was used to assist operators and owners of small public water systems in understanding requirements of the Safe Drinking Water Act (SDWA) and specific National Primary Drinking Water Regulations; and, training to help owners of private wells improve water quality.

[3]Grassroots Rural and Small Community Water Systems Assistance Act, Pub. L. No. 114-346, § 4 (2015).

- **Drinking Water SRF**. EPA also funds asset management training and technical assistance through the Drinking Water SRF. Subject to certain limitations, states may reserve a portion of these grants to fund various activities including training and technical assistance. States can spend 2 percent of their SRF grants to provide small water utilities with technical assistance; up to 4 percent for state program administration and technical assistance to water utilities of any size; up to 10 percent for the development of technical, managerial, and financial capacity, operator certification programs, and other activities; and up to another 15 percent for a variety of activities that can also include programs to develop technical, managerial, and financial capacity. Examples of assistance that states can provide with these funds include such activities as written guidance, one-on-one coaching, and online and classroom training that can include asset management.

- **Environmental Finance Center Grant Program.** EPA also funds asset management activities through its Environmental Finance Center Grant Program. EPA officials said that in fiscal year 2014 they provided a total of $1 million in grants to selected public, private universities or colleges, and nonprofit organizations to provide technical assistance to communities on a range of EPA priorities, including improving financial capacity.[4] This assistance included one-on-one technical assistance, workshops and other classroom trainings, and written guidance. EPA's Environmental Finance Center at the University of New Mexico has been working on asset management since 2003 and has provided training and technical assistance on the use of asset management since 2006.

USDA funds asset management activities through two programs:

- **Water & Waste Disposal Technical Assistance & Training Grant**s. This program provides grants to various nonprofit organizations for technical assistance on managerial topics, assistance with preparing loan applications, and helping water utilities to find solutions to problems in operating their facilities. USDA provides the grant funds for 1 year. In fiscal year 2014, USDA provided an estimated $19 million to nonprofit organizations. Nonprofit organizations can apply to provide services to one state or multiple states. USDA gives priority to

[4]According to EPA documents, the agency requested $2 million in grant funds for this program for fiscal year 2016.

certain types of applicants, including those that serve communities of fewer than 5,500 or fewer than 2,500, and those that will primarily provide ''hands on'' technical assistance and training to water utility managers and operators experiencing problems with operations and maintenance or management.

- **Circuit Rider Program—Technical Assistance for Rural Water Systems**.[5] Under this program, the National Rural Water Association—a training and technical assistance organization serving small communities—is contracted to provide staff in each of the 50 states with technical assistance on day-to-day operational, managerial, and financial issues. Specifically, according to the information the National Rural Water Association publishes on its website,[6] staff known as "circuit riders" work on site with water utility personnel to troubleshoot problems, evaluate alternative technological solutions, recommend operational improvements, assist with leak detection, respond to natural disasters and other emergencies, provide hands-on training, participate in board and council meetings, and conduct user rate analyses. In fiscal year 2014, USDA provided about $15 million for the Circuit Rider Program.

[5]The name of USDA's Circuit Rider program reflects the delivery of the technical assistance—that is, staff with expertise in operating water utilities travel to provide targeted assistance to water utilities.

[6]National Rural Water Association, http://nrwa.org/initiatives/training-and-technical-assistance/ (accessed on November 24, 2015).

Appendix IV: Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 11 2016

OFFICE OF WATER

Mr. Alfredo Gomez
Acting Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Gomez:

Thank you for the opportunity to review and comment on the Government Accountability Office's Draft Report GAO-16-237, "EPA and USDA are Helping Small Water Utilities with Asset Management; Opportunities Exist to Better Track Results." The purpose of this letter is to provide the U.S. Environmental Protection Agency's response to your findings, conclusions and recommendations.

In the draft report, GAO examines water utilities' implementation of asset management including (1) what is known about the use of asset management among the nation's water utilities, including benefits and challenges, and (2) steps that the EPA and the USDA are taking to help small water utilities implement asset management.

As stated in the report, the EPA's fifth national assessment of public water system infrastructure needs show a total twenty-year capital improvement need of $384.2 billion. The Agency agrees with GAO that water utilities may benefit from implementing asset management as it may result in cost savings and more efficient long-term planning. The draft report recognizes some of the challenges to asset management implementation faced by smaller utilities, such as limited human resources, lack of technical knowledge, and lack of understanding and/or support from local decision makers.

Finally, the EPA appreciates the recommendations made by the GAO and is pleased that our partnership with USDA is helping small water utilities manage their infrastructure. While we agree that collecting information on the long-term results and impacts of the EPA's training and technical assistance activities would be beneficial, the approach to doing so must be both practical and low cost. While not highlighted specifically in the GAO report, we think that educating local decision makers on the benefits of implementing asset management practices to protect their infrastructure investment and ensure sustainable and reliable water services is extremely important. Development of a document highlighting asset management best practices for water utilities is one of many possible educational tools that the EPA will consider with USDA, as funding and resources allow. The specific recommendations and our response can be found below.

GAO Recommendation

As the EPA and USDA continue to consider ways to track and promote water utilities' implementation of asset management, we recommend the following:

- **First, that the Administrator of the EPA direct the Office of Ground Water and Drinking Water and the Office of Wastewater Management to continue to include questions on utilities' use of asset management in the clean water needs assessment and consider including questions about water utilities' use of asset management in future drinking water infrastructure needs assessment surveys.**

- **Second, that the Administrator of the EPA, and the Secretary of USDA, through the Rural Development Agency, consider compiling into one document the existing cases and examples of the benefits and costs of asset management and widely share this information with water utilities.**

EPA Response

The Agency generally agrees with GAO's recommendation of continuing to assess the effectiveness of the EPA's asset management training and technical assistance, with the significant caveat that the method for doing so must be both effective and efficient. Although the Agency has included asset management questions as part of the needs assessment surveys in the past, this mechanism has led to limited information regarding the level of implementation of asset management at utilities. The needs assessment surveys may not be the most efficient and effective way to collect this data since the survey's primary focus and design is to assess and quantify the nation's infrastructure need and not the adequate implementation of asset management. The EPA would be willing to explore other means of obtaining data that would provide an indication of how utilities are benefiting from the EPA's asset management training and technical assistance.

Further, the Agency agrees that it is important to educate utilities on the benefits of asset management in protecting the nation's infrastructure investment. In an effort to do this, the Agency has taken steps to help water utilities implement asset management by providing training, technical assistance, free asset management software and resources that not only document the benefits of asset management, but also provide simple steps and worksheets to help utility staff start building their asset management inventory and compiling information on the condition of their assets. As funding and resources allow, we would most likely consider the development of a case study compilation document focused on local decision makers who are key to ensuring that asset management is a priority and is implemented appropriately. The Agency believes that educating local decision makers on asset management can help to (1) improve a system's financial health by prioritizing rehabilitation and replacement of assets, and (2) build public trust by demonstrating to customers how public funds are being prioritized to sustain reliable drinking and wastewater services, and will lead to greater support of active asset management implementation.

Summary of recent financial assistance to support asset management

The Agency's financial assistance to support asset management implementation at the local level has been provided through two main sources of funding, the Drinking Water State Revolving Fund and the national Training and Technical Assistance grants. The Drinking Water State Revolving Fund set-asides are used by the states to support capacity activities, which include asset management and board member training. On average, states use up to 16% of the allowed funds to support capacity building activities. The Agency is aware of six states that require asset management plans and/or board member training as a condition of receiving Drinking Water State Revolving Funds and five other states that assign priority points. In fiscal years 2012-2014, the Agency awarded approximately $32 million in competitive grants to provide training and technical assistance to small public water systems. This funding provided training and tools to improve small system operations and management practices. Areas of assistance

provided by this funding included asset management, as well as capacity improvement, fiscal planning and rate setting. The Agency expects to announce fiscal year 2015 funds by January 2016.

The EPA developed the Check Up Program for Small Systems (CUPSS) to provide all the tools required to implement asset management activities and develop effective asset management plans. The Agency developed CUPSS to help small system owners and operators implement asset management by increasing their knowledge of their systems by conducting an asset inventory, prioritizing the replacement of their assets, developing annual budgets and revising their plans as needed. The Agency continues to conduct trainings and provide technical assistance to utilities and states that use CUPSS, as resources allow. Due to limited resources, the Agency has not been able to upgrade CUPSS in recent years, but utilities and states continue to promote the use of asset management and conduct training using this free online tool.

Thank you for the opportunity to provide comments on the draft report. The Agency looks forward to continuing to work with GAO to improve the implementation of asset management in drinking water and wastewater utilities. If you have any questions, please contact Maria Lopez Carbo in the Office of Ground Water and Drinking Water at lopez-carbo.maria@epa.gov and Bonnie Gitlin at gitlin.bonnie@epa.gov in the Office of Water Management.

Sincerely,

Joel Beauvais
Deputy Assistant Administrator

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

J. Alfredo Gómez, (202) 512-3841 or gomezj@gao.gov

Staff Acknowledgments

In addition to the individual named above, Susan Iott, Assistant Director; Mark Braza; Antoinette Capaccio; Bruce Crise; Tahra Nichols; and Alison O'Neill made key contributions to this report. In addition, Jon Melhus and Kiki Theodoropoulos made important contributions to this report.

Appendix VI: Accessible Data

Agency Comment Letter

Text of Appendix IV: Comments from the Environmental Protection Agency

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Sincerely,

Joel Beauvais

Deputy Assistant Administrator

Related GAO Products

Water Infrastructure: Approaches and Issues for Financing Drinking Water and Wastewater Infrastructure. GAO-13-451T. Washington, D.C.: March 13, 2013.

Water Infrastructure: Comprehensive Asset Management Has Potential to Help Utilities Better Identify Needs and Plan Future Investments. GAO-04-461. Washington, D.C.: March 19, 2004.

Water Infrastructure: Information on Financing, Capital Planning, and Privatization. GAO-02-764. Washington, D.C.: August 16, 2002.

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