



September 2017

# DRINKING WATER AND WASTEWATER INFRASTRUCTURE

Information on  
Identified Needs,  
Planning for Future  
Conditions, and  
Coordination of  
Project Funding

# GAO Highlights

Highlights of [GAO-17-559](#), a report to congressional requesters

## Why GAO Did This Study

Events such as the discovery of lead in drinking water in Flint, Michigan, and the overflow and damage to the spillway at the Oroville Dam in California have drawn attention to the condition of the nation's drinking water and wastewater infrastructure. Conditions such as population growth or drought may further affect a community's needs and plans for such infrastructure.

GAO was asked to review federal programs that provide funding for drinking water and wastewater infrastructure. This report describes (1) how federal agencies and selected states identify drinking water and wastewater infrastructure needs; (2) how federal agencies have supported selected states' planning for future conditions that may affect needs; and (3) the extent to which federal and state agencies have coordinated in funding projects, and any challenges they faced. GAO reviewed eight federal agencies that provide assistance for drinking water and wastewater infrastructure and selected a nongeneralizable sample of six states—Alaska, California, New Mexico, New York, North Dakota, and Tennessee—on the basis of federal infrastructure funding amounts and geography. For the six states, GAO reviewed infrastructure planning and program documents and interviewed federal and state officials.

## What GAO Recommends

GAO is not making recommendations in this report. Federal agencies and states provided technical comments on a draft of this report that GAO incorporated as appropriate.

View [GAO-17-559](#). For more information, contact J. Alfredo Gómez or Anne-Marie Fennell at (202) 512-3841 or [gomezj@gao.gov](mailto:gomezj@gao.gov) or [fennella@gao.gov](mailto:fennella@gao.gov).

September 2017

# DRINKING WATER AND WASTEWATER INFRASTRUCTURE

## Information on Identified Needs, Planning for Future Conditions, and Coordination of Project Funding

### What GAO Found

The Environmental Protection Agency (EPA) and other federal and selected state agencies collect information to identify drinking water and wastewater infrastructure needs through surveys, the administration of agency programs, and studies. EPA's most recent surveys estimated approximately \$655 billion of drinking water and wastewater infrastructure needs nationwide over the next 20 years. The seven other agencies GAO reviewed—the departments of Agriculture (USDA) and Housing and Urban Development (HUD) and the Economic Development Administration, Indian Health Service, Bureau of Reclamation, U.S. Army Corps of Engineers, and Federal Emergency Management Agency (FEMA)—collect information on these needs by administering their programs. For example, the Corps collects information on congressionally authorized water projects. Of the six states GAO selected for review, all but Alaska and California had collected data on their needs such as through surveys of communities. For example, North Dakota biennially collects information on drinking water projects from its communities.

The Corps, Reclamation, and FEMA provide technical assistance and funding to support efforts in the six selected states to plan for future conditions that may affect drinking water and wastewater infrastructure needs. For example, the Corps helped Minnewaukan, North Dakota, identify alternatives for reducing flood risks to the city's drinking water and wastewater infrastructure, and Reclamation worked with Santa Fe, New Mexico, to study its projected water supply and demand. The remaining five agencies have at times been involved in long-term planning but do not have established programs for such purposes.

Federal and state agencies in the six selected states have taken actions to coordinate funding for projects while facing several challenges. For example, agencies in most of the selected states had established interagency coordinating groups that reached out to communities needing funding for projects. In some cases, agencies developed written agreements for their coordinating groups, with such goals as simplifying the application process and encouraging agencies to fund projects together. However, agencies in the selected states faced challenges, such as difficulty in developing a set of specific projects that were ready for funding, despite having infrastructure needs. For example, in the six selected states, USDA did not have enough applicants with projects that were developed to the extent needed to receive funding; therefore, USDA did not loan a total of about \$193 million in available loan funds for fiscal years 2012 through 2016 to communities in those states. GAO found that federal and state agencies within selected states had taken some actions to help address challenges they faced in funding projects; these actions included conducting joint outreach to develop a set of projects ready for funding. EPA and USDA also have taken actions. For example, in February 2017 in response to a GAO recommendation in a prior report, EPA and USDA issued a joint memorandum outlining five practices to help improve interagency collaboration at the state level on drinking water and wastewater infrastructure projects; these practices include using common application materials and conducting joint marketing or outreach.

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## Abbreviations

EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
HHS	Health and Human Services
HUD	Housing and Urban Development
SRF	State Revolving Fund
USDA	Department of Agriculture

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September 20, 2017

### Congressional Requesters

Recent events such as the discovery of lead in drinking water in Flint, Michigan, the overflow and damage to the spillways at the Oroville Dam in California, and frequent sewer overflows throughout the United States have drawn attention to the condition of the nation's drinking water and wastewater infrastructure. Such infrastructure includes drinking water treatment plants and distribution pipelines; wastewater treatment plants and sewers; and a system of wells, dams, and reservoirs to hold the water supply. Across the country, according to Environmental Protection Agency (EPA) documents, there are about 52,000 community water systems and 16,000 public wastewater treatment systems that provide drinking water and wastewater services to the majority of the population. In addition, the federal government owns a system of about 3,400 dams to manage and supply water for communities across the country, among other purposes. Local communities also own and manage their own dams and reservoirs.<sup>1</sup>

Local governments and their utilities plan investments to repair, replace, and upgrade drinking water and wastewater infrastructure and pay the majority of the costs, primarily by charging rates for drinking water and wastewater services. Communities and utilities can receive funding and planning assistance from the federal government and their respective states to repair, replace, and upgrade their drinking water and wastewater infrastructure. In 2014, the most recent year for which data were available, state and local governments spent approximately \$104.6 billion on drinking water and wastewater infrastructure projects, and the federal government spent \$4.4 billion, according to 2015 Congressional Budget Office data.<sup>2</sup>

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<sup>1</sup>According to the U.S. Army Corps of Engineers' National Inventory of Dams, in 2016, there were 90,580 dams in the United States, owned by federal, state, local, and private entities. The federal government owns approximately 4 percent of the total inventory of dams, and state and local governments and public utilities own 31 percent. The remaining 65 percent of the total inventory of dams are owned privately.

<sup>2</sup>Congressional Budget Office, *Public Spending on Transportation and Water Infrastructure, 1956 to 2014* (Washington, D.C.: March 2015).

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Federal funding and assistance are available for local drinking water and wastewater infrastructure projects through programs administered by eight federal agencies: EPA and the Departments of Agriculture (USDA), Commerce, Defense, Health and Human Services (HHS), Homeland Security, Housing and Urban Development (HUD), and the Interior. The programs administered by these agencies have different purposes and varying eligibility criteria that may focus funding or assistance to communities on the basis of population size, economic conditions, or geographic location. For example, USDA's Rural Utilities Service provides water and waste disposal grants and direct and guaranteed loans to rural communities with populations of 10,000 or fewer, while EPA's Drinking Water and Clean Water State Revolving Fund (SRF) programs can provide funding to communities of all sizes. The eligibility criteria can focus on particular program goals or geographic areas. For example, EPA's Clean Water SRF program prioritizes funding on the basis of water quality goals, and Commerce's Economic Development Administration has established formal nationwide criteria for selecting infrastructure projects to fund, such as criteria that prioritize projects located in an economically distressed area. In contrast, Interior's Bureau of Reclamation and Defense's U.S. Army Corps of Engineers have not historically had drinking water and wastewater infrastructure programs with specific eligibility criteria; instead, they have generally provided funding to water projects under specific congressional authorizations.<sup>3</sup> Similarly, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) and EPA provide grant funding for projects that improve the disaster resiliency of drinking water and wastewater infrastructure.

Federal agencies can also provide assistance to local communities to help them plan for future conditions that may affect drinking water and wastewater infrastructure needs. Such conditions include changes in population or land use, which can affect demand for services, or changes in climate, which can cause droughts or flooding, among other things.

You asked us to review the federal programs that provide funding for drinking water and wastewater infrastructure. This report describes (1) how federal agencies and selected states identify drinking water and

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<sup>3</sup>One exception to this was Reclamation's directive under Title I of the Rural Water Supply Act of 2006 (Pub .Law. No. 109-451, Tit. I, 120 Stat. 3345, 3346) authorizing Reclamation to establish a Rural Water Supply Program in the 17 western states; however, this authority terminated on September 30, 2016.

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wastewater infrastructure needs; (2) how federal agencies have supported selected states in planning for future conditions that may affect such needs; and (3) the extent to which federal and state agencies have coordinated in funding drinking water and wastewater infrastructure projects, and any challenges they face in funding these projects.

To address these objectives, we reviewed our previous reports to identify the agencies that provide funding or planning assistance to states or communities for drinking water and wastewater infrastructure and identified eight agencies that do so: EPA, USDA, HUD, Commerce, Interior, HHS, Defense, and the Department of Homeland Security. Our review included interviews with officials from federal agencies' regional or state offices and state agencies responsible for overseeing and administering these programs in a nonprobability sample of six states: Alaska, California, New Mexico, New York, North Dakota, and Tennessee. To obtain a diverse sample of states with a range of coordination experience on drinking water and wastewater funding, we selected these states on the basis of geographic diversity, number of federal agencies that provided funding in the state for drinking water and wastewater infrastructure projects, and the presence or absence of a formal funding coordination group. State coordination groups were identified in a 2015 report prepared on behalf of the Small Community Water Infrastructure Exchange, a network of water funding officials.<sup>4</sup> The sample of states is not generalizable, and the results of our work do not apply to all 50 states; however, they provide illustrative examples of state infrastructure programs. We also interviewed federal and state officials administering funding from congressionally authorized regional economic development authorities such as the Appalachian Regional Commission, Denali Commission, and Delta Regional Authority, as appropriate.<sup>5</sup>

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<sup>4</sup>Steven J. Grossman, *A Survey of the States on the Current Level of Activity by Statewide Support Groups Involved in Water Infrastructure Funding and Technical Assistance* (Columbus, Ohio: July 10, 2015). The Small Community Water Infrastructure Exchange, which operates under the auspices of the Council of Infrastructure Financing Authorities, is a network of water funding officials who come from public and nonprofit environmental funding and technical assistance agencies. According to the report, the main purpose of the network is to facilitate communication among peer group members throughout the United States about what they are doing in their respective states to assist small or rural communities with their environmental infrastructure needs.

<sup>5</sup>Congressionally authorized regional economic development authorities such as the Appalachian Regional Commission, Denali Commission, and Delta Regional Authority can provide funding or assistance for drinking water and wastewater infrastructure in geographically designated regions.

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To describe how federal agencies and selected states identify drinking water and wastewater infrastructure needs, we identified federal requirements directing EPA and Indian Health Service to collect information on needs and reviewed these agencies' most recent reports on needs, as well as any national, regional, or state reports on needs issued over the last 10 years by the other six federal agencies and the six selected states.<sup>6</sup> We assessed the reliability of the data reported by EPA and Indian Health Service by reviewing documentation on data collection and interviewing agency officials. We determined the data on drinking water and wastewater infrastructure needs from each of these sources were reliable for the purposes of our reporting objectives.

To describe how the eight agencies supported selected states in planning for future conditions that may affect drinking water and wastewater infrastructure needs, we reviewed federal and selected state program and planning documents. We interviewed officials or obtained written responses from the federal agencies and from state agencies in the six selected states. State agencies included state water boards and commissions, infrastructure funding agencies, and emergency management agencies as appropriate.

To describe the extent to which the eight federal agencies and selected state agencies have coordinated to fund projects and any challenges they face in doing so, we reviewed federal and state program documents, interagency agreements, and project data. We then interviewed federal and state agency officials on project funding and coordination, as well as on challenges they face in funding projects. We also compared actions the agencies took with key considerations for implementing interagency collaborative mechanisms and practices to enhance and sustain collaboration identified in our previous work.<sup>7</sup> We reviewed a report by EPA's Office of Inspector General on the status of Drinking Water SRF

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<sup>6</sup>To conduct this work, we did not define the concept of need or conduct an independent review of the studies that identify needs for drinking water and wastewater infrastructure, nor did we evaluate the legitimacy of these claims.

<sup>7</sup>GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012) and GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005). For the purpose of this report, we use the term "collaboration" broadly to include interagency activities that we and others have defined as "coordination." We do so because there are no commonly accepted definitions for these terms and we are unable to make definitive distinctions between these different types of interagency activities.



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program funding.<sup>8</sup> We obtained and analyzed fiscal year 2016 funding data on drinking water and wastewater infrastructure from each of the federal agencies and assessed the reliability of the data by obtaining information from agency officials. In some cases, agencies provided obligation data, while other agencies provided budget allocation data. We determined the data were reliable for our purposes of reporting total funding available by agency. Appendix I contains more information on our objectives, scope, and methodology.

We conducted this performance audit from March 2016 to September 2017 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.

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## Background

This section provides information on federal and state regulation of drinking water and wastewater infrastructure; federal funding for drinking water and wastewater infrastructure projects; and our prior work on coordination of drinking water and wastewater infrastructure funding and leading collaborative practices and key considerations for collaborative mechanisms.

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## Federal and State Regulation of Drinking Water and Wastewater Utilities

The Safe Drinking Water Act and the Clean Water Act authorize EPA's Drinking Water SRF and Clean Water SRF programs, respectively,<sup>9</sup> and authorize EPA to regulate the quality of drinking water provided by community water supply systems and the discharge of pollutants into the nation's waters. Under the Safe Drinking Water Act, EPA, among other things, sets standards to protect the nation's drinking water from

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<sup>8</sup>Environmental Protection Agency, Office of Inspector General, *Unliquidated Obligations Resulted in Missed Opportunities to Improve Drinking Water Infrastructure*, Report No. 14-P-0318 (Washington, D.C.: July 16, 2014).

<sup>9</sup>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). 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). The Water Quality Act of 1987 amended the Clean Water Act.

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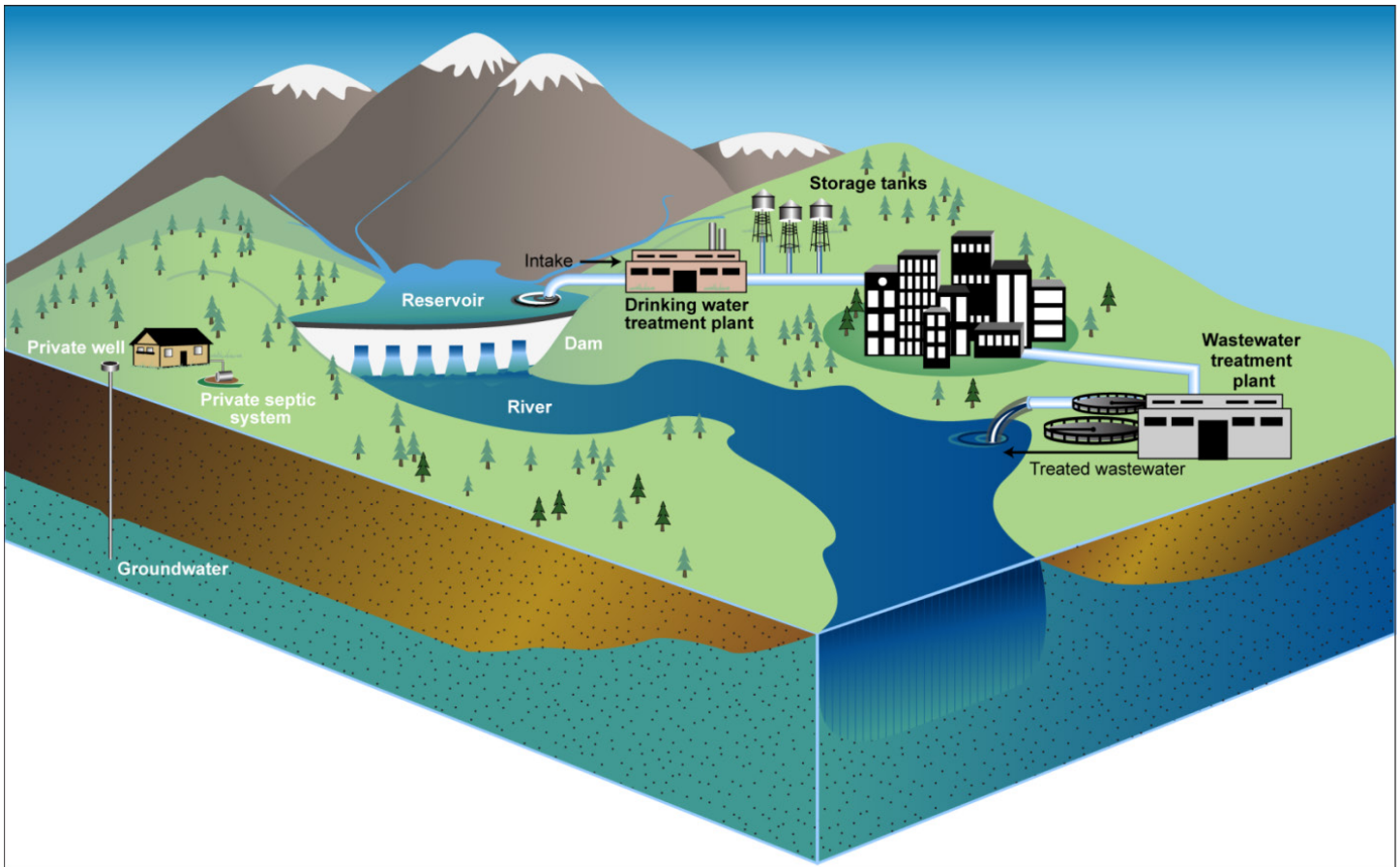
contaminants, such as lead and arsenic. The Clean Water Act generally prohibits the discharge of pollutants from “point sources”—such as discharge pipes from industrial facilities and wastewater treatment plants—without a permit.

Under the acts, EPA may authorize states to carry out their own safe drinking water and clean water programs in lieu of the federal program, as long as the state programs are at least as stringent as the federal ones. As a result, most states have primary responsibility for enforcing the applicable requirements of the Safe Drinking Water Act and administering the applicable requirements under the Clean Water Act. Specifically, for drinking water utilities, all states except Wyoming and the District of Columbia have primary permitting and enforcement authority under the Safe Drinking Water Act. For wastewater utilities, all states except Idaho, Massachusetts, New Hampshire, and New Mexico have full or partial permitting and enforcement responsibility under the Clean Water Act.

Drinking water and wastewater systems are managed by utilities that may be organized differently depending on the city or community they serve. For example, drinking water service may be provided by one utility, and wastewater service may be provided by a separate utility, or a single utility may provide both services. Regardless of the configuration, a utility can be owned and managed by a municipality, a county, an independent district or authority, a private company, or a not-for-profit water association, among others. Utilities may serve a city and neighboring area, a county, or multiple counties. To pay for operations, maintenance, repair, replacement, and upgrades of their infrastructure, drinking water and wastewater utilities generally raise revenues by charging their customers for the services they provide. Utilities generally identify planned investments as part of their operating budgets and long-term capital improvement plans.

Examples of key types of drinking water infrastructure include groundwater wells, dams, reservoirs, facilities to treat water for drinking, water storage tanks, laboratories to test the water, and drinking water distribution pipelines and the service lines that connect them to buildings. Examples of key wastewater infrastructure include sewer lines, tanks, and facilities to treat wastewater. Individuals or properties not served by utilities have private wells and septic systems (see fig. 1).

Figure 1: Key Types of Drinking Water and Wastewater Infrastructure



Sources: GAO and EPA. | GAO-17-559

## Federal Funding and Assistance for Drinking Water and Wastewater Infrastructure Projects

Eight federal agencies administer a number of programs that provide access to funding and assistance for drinking water and wastewater infrastructure. Some agencies' programs allocate funds to state agencies as grants, and the state agencies in turn use the funds to make loans or award grants to local governments or to utilities for projects. EPA's Drinking Water and Clean Water SRF program, HUD's Community Development Block Grant Program, and FEMA's Hazard Mitigation Grant Program provide funds in this way. The other five agencies make loans, award grants, or provide assistance directly to local communities or utilities to fund water and wastewater infrastructure. The Corps, Reclamation, Indian Health Service's Sanitation Facilities Construction Program, the Economic Development Administration, and USDA's Rural

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Utilities Service provide funds in this way. Additional details about the programs are described below, in descending order by the amount of their fiscal year 2016 funding:

- **EPA.** EPA provides annual grants to states to help finance utility drinking water and wastewater projects nationwide through the Drinking Water and Clean Water State SRF programs.<sup>10</sup> States use this funding, and provide a required minimum 20 percent match, to capitalize their SRFs. The states use the funds to provide low-cost loans or other financial assistance to communities for, among other things, a wide range of water infrastructure projects. Loan repayments and interest payments, as appropriate, are returned to the SRFs and are available for future loans. However, the ability to sustain the SRF depends on the loans being fully repaid. In addition, EPA provides funds from the Drinking Water and Clean Water SRF programs to tribal nations throughout the United States for drinking water and wastewater projects. In fiscal year 2016, EPA's Drinking Water and Clean Water SRF programs were funded at \$863 million and \$1.39 billion, respectively.
- **USDA.** Under its Water and Waste Disposal Program, USDA's Rural Utilities Service provides grants and loans for drinking water and wastewater projects in rural areas—defined by USDA as a city, town, or unincorporated area that has a population of no more than 10,000 inhabitants. USDA can provide assistance for various activities, such as construction of drinking water treatment and sewage collection facilities, connection of single-family homes to drinking water distribution or wastewater collection lines, and training for utility operators. The Rural Utilities Service allocates program funds to USDA offices in each state; these offices are required to loan or grant their funds by 10 months into the year and return any unobligated funds to USDA headquarters for reallocation to other states.<sup>11</sup> Under the program, a staff of engineers and loan specialists works with local communities and their utilities to fund projects, and USDA also

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<sup>10</sup>The Drinking Water State Revolving Fund Program was established to make funds available to drinking water systems to, among other things, finance infrastructure improvements. The Clean Water State Revolving Fund Program was established to fund, among other things, wastewater treatment projects.

<sup>11</sup>According to program regulations, each of USDA's state offices is required to obligate half of its allocation by mid-year and all of its allocation near the first of August. If funds remain unobligated, the state office must return those funds to the national office reserve, so they can be made available to any top-scoring projects that can be obligated by the end of the fiscal year.

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provides funding for technical assistance to help utilities apply for funding and operate and maintain their drinking water and wastewater infrastructure. In fiscal year 2016, USDA provided \$549 million in grants and \$1.21 billion in loans through its state offices.

- **HUD.** HUD disburses grants to states and local governments through its Community Development Block Grant program to fund housing, infrastructure, and other community development activities. The annual appropriation for the block grants is allocated according to formulas so that, after setting aside specified amounts for Indian tribes, insular areas, and special purposes, 70 percent is allocated among participating metropolitan cities and urban counties and 30 percent among the states to serve cities with populations of fewer than 50,000 and counties with populations of fewer than 200,000.<sup>12</sup> In addition, federal law requires that not less than 70 percent of the total Community Development Block Grant funding be used for activities that benefit low- and moderate-income persons. Historically, according to HUD data, approximately 10 percent of total funding has been used for drinking water and wastewater infrastructure.<sup>13</sup> Total Community Development Block Grant funding was \$3.01 billion in fiscal year 2016, and, according to HUD officials, at least \$381.5 million was used to fund drinking water and wastewater infrastructure.
- **Indian Health Service.** HHS's Indian Health Service funds and constructs drinking water and wastewater projects through its Sanitation Facilities Construction program. This assistance is available to tribal nations within the United States and includes various projects such as distribution and collection lines, treatment facilities, and home connections. Indian Health Service's Sanitation Facilities Construction Program was funded at \$99.4 million in fiscal year 2016.

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<sup>12</sup>The Community Development Block Grant program was created by Title I of the Housing and Community Development Act of 1974, Pub. L. No. 93-383, tit. I, 88 Stat. 633, 633-653 (codified as amended at 42 U.S.C. §§ 5301-5321). Additional information about the Community Development Block Grant formula process and the definition of metropolitan cities and urban counties is found in Title I of the Act.

<sup>13</sup>Congressional Research Service, *Federally Supported Water Supply and Wastewater Treatment Programs*. (Washington, D.C.: Mar. 17, 2016).

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- **Reclamation.** Reclamation provides different types of assistance for drinking water and wastewater infrastructure in the 17 western states, as directed by Congress.<sup>14</sup>
    - Reclamation received authorization, under the Rural Water Supply Act of 2006, to establish a rural water supply program. Under the program, Reclamation was authorized to work with rural communities and Indian tribes to identify municipal and industrial water needs and options to address such needs through appraisal investigations and in some cases feasibility studies. The authority for the program expired at the end of fiscal year 2016. Congress must authorize construction of rural water projects before they can begin.<sup>15</sup> In fiscal year 2016, Reclamation received \$83.5 million in funding for six previously authorized rural water infrastructure projects.
    - Reclamation also provides funding and assistance to states through certain WaterSMART (Sustain and Manage America's Resources for Tomorrow) programs that promote the efficient use of water, integrating water and energy policies to support the sustainable use of all natural resources, and coordinating the water conservation activities of Interior's agencies. First, Reclamation's Title XVI program helps states and communities create supplemental water supplies by investigating and identifying opportunities for reclamation and reuse of municipal, industrial, domestic, and agricultural wastewater, naturally impaired ground and surface waters, and the program provides funding for the design and construction of facilities to reclaim and reuse wastewater. Further, Reclamation's Basin Studies Program partners with state and local governments to identify strategies to address imbalances in water supply and demand, including the development of adaptation and mitigation strategies to meet current and future water demands. In fiscal year 2016, the Title

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<sup>14</sup>As set out in section 8 of the Federal Water Project Recreation Act of 1965, Pub. L. No. 89-72, § 8, 79 Stat. 213, 217 (codified at 16 USCS § 4601-19), Reclamation may only undertake feasibility studies as specifically authorized by law, for example in legislation such as the Rural Water Supply Act of 2006, PL 109-451 § 103, 120 Stat. 3345, 3347 (codified at 43 U.S.C. § 2402) and the SECURE Water Act of 2009, Pub. L. No. 111-11, Tit. IX, Subtit. F, § 9503(d), 123 Stat. 991, 1333. See also Reclamation Manual Directives and Standards CMP 09-02.

<sup>15</sup>Instead of funding new projects, Congress has typically appropriated funding for already authorized projects. No new rural water infrastructure projects have been authorized since 2009.

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XVI program received \$32.4 million and the Basin Studies Program received \$5.2 million in funding.

- **Corps.** The Corps provides various types of assistance for drinking water and wastewater projects in communities, as directed by Congress.
  - Congress has authorized and appropriated funds for the Corps to provide assistance projects that benefit rural communities in need of water or wastewater infrastructure, among other things, through the Corps' Section 219 Environmental Infrastructure Program.<sup>16</sup> In fiscal year 2016, this program received \$55 million in funding.
  - Under Section 14 of the U.S. Flood Control Act of 1946, the Corps' Emergency Streambank and Shoreline Protection program can plan, design, and construct erosion control projects that protect public infrastructure. In fiscal year 2016, this program received \$2 million in funding.
  - Under Section 22 of the Water Resources Development Act of 1974, the Corps' Planning Assistance to States program can assist states, local governments, and tribes with the preparation of comprehensive plans for development and conservation of water and related land resources. In fiscal year 2016, this program received \$6 million in funding.
  - Finally, the Corps manages about 140 reservoirs containing approximately 10 million acre-feet of storage for municipal and industrial water supply.<sup>17</sup> Under the Water Supply Act of 1958, the Corps enters into agreements with water users for water storage within Corps reservoirs.
- **Economic Development Administration.** Through its Public Works and Economic Development Program,<sup>18</sup> Commerce's Economic Development Administration provides grants to economically distressed areas to help revitalize, expand, and upgrade their physical

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<sup>16</sup>The Corps is authorized to provide assistance to nonfederal entities for specific projects, including wastewater treatment and related facilities and water supply, storage, treatment, and distribution facilities, by section 219 of the Water Resources and Development Act of 1992, Pub. L. No. 102-580 § 219, 106 Stat. 4797, 4835, as amended.

<sup>17</sup>An acre-foot is a measurement of water volume. One acre-foot is enough to cover an acre—about a football field in length and width—with water 1 foot deep.

<sup>18</sup>The Economic Development Administration's Public Works Program is authorized by Section 201 of the Public Works and Economic Development Act of 1965, Pub. L. No. 89-136 § 201, 79 Stat. 552, 554-555 (codified as amended at 42 U.S.C. § 3141).

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infrastructure, including public works investments such as drinking water and wastewater infrastructure.<sup>19</sup> In fiscal year 2016, the Public Works and Economic Development program received \$100 million in funding, about \$14.4 million of which was used for drinking water or wastewater infrastructure projects, according to Economic Development Administration estimates.

- **FEMA.** Through its Hazard Mitigation Grant Program, FEMA may provide funding for drinking water and wastewater infrastructure projects in certain circumstances when the President has declared a major disaster. States receive Hazard Mitigation Grant Program funding if approved for them as part of a major disaster declaration, and grant funding is competitively awarded by the states for projects in local communities. Communities or their utilities can submit applications to the state for projects for their water and wastewater facilities that the state may choose to include in its Hazard Mitigation grant application to FEMA.<sup>20</sup> As of May 2017, FEMA's 31 presidentially declared major disasters during fiscal year 2016 had resulted in over \$533 million in available funds for the Hazard Mitigation Grant Program, \$3.9 million of which was for drinking water and wastewater projects.

Each of the eight federal agencies we reviewed has its own programs and processes for providing funding and assistance for drinking water and wastewater infrastructure projects.<sup>21</sup> Communities or utilities have the discretion to apply to one or more federal or state programs for funding. In

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<sup>19</sup>Projects eligible for assistance generally must be located in areas that have an unemployment rate that is, for the most recent 24-month period for which data are available, at least 1 percent higher than the national average; have a per capita income that is 80 percent or less of the national average; or have experienced or are about to experience a special need arising from actual or threatened severe unemployment or economic adjustment problems resulting from severe short-term or long-term changes in economic conditions. 42 U.S.C. § 3161(a). The regulatory eligibility criteria are in 13 C.F.R. § 301.3(a).

<sup>20</sup>Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act as amended authorizes FEMA to provide public assistance grants, and section 404 authorizes FEMA to provide hazard mitigation grants. Pub. L. No. 93-288, §§ 404, 406 (1974) (codified as amended at 42 U.S.C. §§ 5170c, 5172).

<sup>21</sup>The application processes for state SRF programs and USDA's Water and Waste Disposal program, for example, generally include (1) completing an application that asks for, among other things, basic demographic, legal, and financial information associated with the project; (2) developing a preliminary engineering report that provides basic design specifications and other technical information for the project; and (3) conducting an environmental analysis that considers the environmental effects of the proposed project and alternatives.



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some cases, federal and state agencies coordinate to jointly fund the same project if the project is too large for one agency to fund or if joint funding makes the project more affordable for the utility. In other cases, programs may work together by separately funding different parts of a large project or different phases of a multi-year project.

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### Prior GAO Work on Coordination on Drinking Water and Wastewater Infrastructure

Our previous work on federal drinking water and wastewater infrastructure funding programs for rural areas has raised questions about the sufficiency of coordination among programs. In December 2009, we found that EPA, USDA, and other agencies that fund drinking water and wastewater infrastructure for rural communities along the U.S.-Mexico border did not have coordinated policies and processes.<sup>22</sup> We suggested that Congress consider establishing an interagency mechanism, such as a task force on water and wastewater infrastructure, to evaluate the degree to which gaps in water and wastewater infrastructure programs exist in the U.S.-Mexico border region and the resources needed to address them. In April 2014, EPA and USDA published a report describing a joint effort to address the critical public health and environmental challenges in the U.S.-Mexico border region. This effort was created partly in response to our December 2009 report in an effort to leverage collective resources to identify needs within the border region and to implement compatible and coordinated policies and procedures.

Similarly, in October 2012, we found that federal funding for drinking water and wastewater infrastructure is fragmented across multiple agencies and programs. We also found that potentially duplicative application requirements when applying to multiple federal or state programs, including preliminary engineering reports and environmental analyses, may make it more costly and time-consuming for communities to complete the application process.<sup>23</sup> We recommended that EPA and USDA ensure the timely completion of an interagency effort to develop guidelines to assist states in developing their own uniform preliminary engineering reports to meet federal and state requirements. We also recommended that the agencies work together and with state and community officials to develop guidelines to assist states in developing

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<sup>22</sup>GAO, *Rural Water Infrastructure: Improved Coordination and Funding Processes Could Enhance Federal Efforts to Meet Needs in the U.S.-Mexico Border Region*, [GAO-10-126](#) (Washington, D.C.: Dec. 18, 2009).

<sup>23</sup>GAO, *Rural Water Infrastructure: Additional Coordination Can Help Avoid Potentially Duplicative Application Requirements*, [GAO-13-111](#) (Washington, D.C.: Oct. 16, 2012).

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uniform environmental analyses that could be used, to the extent appropriate, to meet state and federal requirements for water and wastewater infrastructure projects. EPA and USDA neither agreed nor disagreed with these recommendations but have taken actions, along with HUD and other agencies, to respond to these recommendations. First, in 2015, EPA, USDA, HUD, and Indian Health Service adopted a uniform preliminary engineering report template and associated guidance for federal and state officials. Second, in February 2017, EPA and USDA issued a joint memorandum identifying five practices for interagency collaboration on drinking water and wastewater infrastructure projects, including reducing the potential for duplication of effort during the environmental review process.<sup>24</sup>

Our September 2012 report on key considerations for implementing interagency collaborative mechanisms discusses a variety of mechanisms to implement interagency collaborative efforts and issues for federal and state agencies to consider in implementing collaborative mechanisms.<sup>25</sup> Issues for consideration include the following, many of which are related to practices to enhance and sustain collaboration identified in our previous work: including all relevant participants, documenting written guidance and agreements, sustaining leadership, clarifying roles and responsibilities, bridging organizational cultures, identifying resources, and defining outcomes and accountability.<sup>26</sup>

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<sup>24</sup>Environmental Protection Agency and U.S. Department of Agriculture, *Environmental Review Process Coordination Best Practices* (February 2017).

<sup>25</sup>[GAO-12-1022](#).

<sup>26</sup>In our October 2015 report, [GAO-06-15](#), we described how agencies can enhance and sustain their interagency collaborative efforts by engaging in the following eight practices: (1) define and articulate a common outcome; (2) establish mutually reinforcing or joint strategies; (3) identify and address needs by leveraging resources; (4) agree on roles and responsibilities; (5) establish compatible policies, procedures, and other means to operate across agency boundaries; (6) develop mechanisms to monitor, evaluate, and report on results; (7) reinforce agency accountability for collaborative efforts through agency plans and reports; and (8) reinforce individual accountability through performance management systems.

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## Federal and Selected State Agencies Collect Information on Water Infrastructure Needs through Surveys, Program Administration, and Studies

The eight federal agencies and the six selected states identify drinking water and wastewater infrastructure needs through surveys, the administration of programs, and studies. More specifically, EPA collects information on nationwide water infrastructure needs through surveys of communities, and seven other federal agencies collect narrower data on specific projects as part of their program administration. Four of the six selected states collect information on projects in their respective states through surveys of communities and statewide studies.

EPA collects and reports information on nationwide drinking water and wastewater infrastructure needs. Specifically, the Safe Drinking Water Act and the Clean Water Act direct EPA to collect information on drinking water and wastewater projects that are eligible for the SRF programs. EPA collects the information from a sample of utilities every 4 years, with the assistance of states, through surveys of needs, and it publishes the results in its Drinking Water Infrastructure Needs Survey and Assessment and its Clean Watersheds Needs Survey.<sup>27</sup> In these reports, EPA estimated infrastructure needs, including the costs of capital improvement projects to repair, replace, and upgrade existing drinking water and wastewater infrastructure over the next 20 years. In 2013 and 2016, when EPA published its most recent survey results, EPA estimated approximately \$655 billion in drinking water and wastewater infrastructure needs nationwide. For the six states we selected to review, EPA estimated a total of approximately \$123 billion in drinking water and wastewater infrastructure needs. EPA's estimates include, for example, the following types of projects:

- **Drinking water projects serving a range of community sizes.** EPA sends a questionnaire to all large utilities and a sample of medium utilities in each state.<sup>28</sup> The utilities complete the questionnaire, provide documentation of projects, and send the questionnaire to their state coordinator for review. The coordinator then provides the information for EPA's final review. The information provided includes projects to repair or replace drinking water sources, transmission and

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<sup>27</sup>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 *Clean Watersheds Needs Survey 2012: Report to Congress*, EPA-830-R-15-005 (Washington, D.C.: January 2016).

<sup>28</sup>EPA defines large community utilities as those serving more than 100,000 persons and medium utilities as those serving 3,301 to 100,000 persons.

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distribution pipelines, treatment facilities, and storage facilities. For example, a transmission and distribution project could include replacement or rehabilitation of pumping stations or distribution pipelines due to age or deterioration, and treatment projects could include the construction, expansion, and rehabilitation of infrastructure to reduce contamination through various treatment processes. To estimate the needs of small communities' drinking water utilities (defined by EPA as those serving 3,300 and fewer persons), EPA used the results of its 2007 survey of utilities in these areas and updated the costs using a model it developed for this purpose.<sup>29</sup> In addition, for selected years, EPA conducts surveys to estimate the needs of water systems for American Indians and Alaska Native villages.<sup>30</sup>

- **Wastewater projects serving a range of community sizes.** EPA also surveys utilities on wastewater projects for a range of community sizes and defines small communities in this survey as those with populations of fewer than 10,000 people. States provide EPA with documentation on utilities' projects, and EPA performs a final review of the information. The information provided includes projects related to wastewater treatment, wastewater conveyance, combined sewer overflows, stormwater management, recycled water distribution, and decentralized wastewater treatment systems. For example, a conveyance project could include replacement or repair of pipes, and a combined sewer overflow project could include reconstructing combined sewers to prevent overflows or repairing deteriorating sewer lines.<sup>31</sup>

EPA's estimates are not required to be comprehensive estimates of all drinking water and wastewater infrastructure needs, and they do not

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<sup>29</sup>Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*.

<sup>30</sup>Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*.

<sup>31</sup>Combined sewer systems collect stormwater runoff, domestic sewage, and industrial wastewater into one pipe, unlike sanitary sewer systems that collect domestic sewage and industrial wastewater in sewer lines that are separated from stormwater pipelines. Both types of systems may overflow during storm events. Under normal conditions, the wastewater collected in combined sewer pipes is transported to a wastewater treatment plant for treatment and then discharged into a nearby stream, river, lake, or other water body. However, during heavy rain or snow storms, when the volume of the wastewater can exceed a treatment plant's capacity, combined sewer systems release excess untreated wastewater directly into nearby water bodies. These releases are known as combined sewer overflow.

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include projects that address some existing and future drinking water and wastewater infrastructure needs. Specifically, they do not include the following types of projects:

- **Projects that are ineligible for SRF loan funding.** The Drinking Water SRF and the Clean Water SRF restrict funding for certain types of projects. For example, the Drinking Water SRF does not allow funding for (1) rehabilitation or replacement of water supply dams and reservoirs, which may be the responsibility of the Corps, Reclamation, or state or local entities; and (2) privately owned infrastructure such as drinking water wells not part of a drinking water system. The Clean Water SRF does not allow, for example, funding for (1) privately owned wastewater facilities and (2) wastewater services for federal facilities.
- **Projects about which states choose not to collect or submit information.** Under the Safe Drinking Water Act, EPA's assessment of drinking water needs is used to allocate funding to states from the Drinking Water SRF program. However, under the Clean Water Act, EPA's allocation of funding to states from the Clean Water SRF program is based on formulas established by the statute, not on EPA's assessment. According to EPA officials, because of this statutory formula and the level of effort needed to complete the assessment survey, some states may not always participate in the Clean Watershed Needs survey or may limit their level of effort in providing information on infrastructure needs. For example, South Carolina did not participate in the 2012 assessment, and Alaska, North Dakota, and Rhode Island did not participate in the 2008 assessment.
- **Projects submitted by utilities without proper documentation on project scope and cost.** According to EPA documents and officials from two selected states, the survey results may underestimate the needs of utilities because some communities lack the technical and financial resources to complete the assessment for the survey. If communities did not provide the necessary documentation, EPA did not include their projects in the assessments. For example, according to the 2011 Drinking Water Infrastructure Needs Survey and Assessment, EPA rejected 15 percent of all submitted projects because they either did not meet documentation criteria or appeared to be ineligible.
- **Projects planned for more than 5 to 10 years from the date of the assessment.** According to EPA documents and officials from two selected states, communities often do not have the strategic planning

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capacity to anticipate their needs for the full 20 years covered by the assessments. As a result, EPA's most recent assessment of wastewater infrastructure needs noted that nearly all projects included are those that will be completed within 5 years. Similarly, an EPA official told us that the typical planning time frame reflected in the assessment of drinking water needs is 7 to 10 years.

The seven other federal agencies in our review collect more narrowly focused information on drinking water and wastewater infrastructure projects as part of administering their specific programs. These agencies generally do not collect information on needs through recurring surveys such as those conducted by EPA; instead, through the administration of their programs, they receive the information through specific assessments, congressional authorizations, and loan or grant project funding proposals by state and local governments and communities. Information collected by these agencies includes the following:

- **USDA.** The agency collects information on drinking water and wastewater infrastructure projects funded or partially funded through its administration of the Rural Utilities Service's Water and Waste Disposal Loan and Grant Program.<sup>32</sup> According to USDA officials, the information is gathered through an online application system through which applicants submit project information for program funding. USDA uses this system to track funded projects and to collect and track information on projects that were submitted but not funded. As of fiscal year 2016, USDA officials we interviewed said they maintained a backlog of \$2.5 billion in projects that have not yet received funding through the Water and Waste Disposal Program. In addition, in July 2015, the Rural Community Assistance Partnership—a contractor hired by USDA—published a one-time assessment that described, ranked, prioritized, and identified potential improvements to drinking water and wastewater needs of 2,177 colonias in 35 border counties in Arizona, California, New Mexico, and Texas.<sup>33</sup> According to the

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<sup>32</sup>USDA's Water and Waste Disposal Loan and Grant program was authorized in 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).

<sup>33</sup>Rural Community Assistance Partnership, *U.S.-Mexico Border Needs Assessment and Support Project: Phase II Assessment Report* (Washington, D.C.: July 30, 2015). USDA defines "colonia" as "[a]ny identifiable community designated in writing by the State or county in which it is located; determined to be a colonia on the basis of objective criteria including lack of potable water supply, lack of adequate sewage systems, and lack of decent, safe, and sanitary housing, inadequate roads and drainage; and existed and was generally recognized as a colonia before October 1, 1989." 7 C.F.R. § 1777.4.

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report, the assessment was the first colonias-level evaluation of drinking water and wastewater needs along the U.S.-Mexico border; the report did not estimate the cost or number of projects to address the needs identified.

- **HUD.** The agency collects information on projects it funds or partially funds through its administration of the Community Development Block Grant program, including drinking water and wastewater infrastructure projects to support community development, primarily in low- and moderate-income communities. HUD collects these data in its Integrated Disbursement and Information System. HUD officials we interviewed estimated they funded \$66 million for drinking water and wastewater infrastructure in the selected states in fiscal year 2016.
- **Indian Health Service.** As required by the Indian Health Care Improvement Act, Indian Health Service annually collects and reports information on the drinking water and wastewater infrastructure needs of Indian nations and native communities nationwide.<sup>34</sup> In consultation with tribes, the agency's 12 area offices collect data on projects designed to meet an immediate drinking water or wastewater need. Projects are entered and tracked in the agency's Sanitation Deficiency System database. According to Indian Health Service documents, the database is updated annually to account for inflation and changes in federal and state regulations, to add projects designed to address new needs, and to remove projects that have been completed. In 2015, the Indian Health Service database included an estimated cost of more than \$2.66 billion to upgrade all tribal communities' drinking water and wastewater infrastructure systems to comply with all drinking water supply and water quality laws.
- **Corps.** The Corps tracks congressionally authorized water projects and studies, including drinking water and wastewater infrastructure projects, in centralized databases. The agency also collects information on the potential repair and upgrade of the dams it manages, some of which impound reservoirs to be used as drinking water sources. The Corps manages 715 dams nationwide and, based on estimates it developed, has \$24 billion in upgrades and repairs to these facilities over the next 50 years.
- **Reclamation.** The bureau collects some information on tribal and nontribal drinking water infrastructure needs for congressionally authorized projects through its administration of the Rural Water

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<sup>34</sup>Pub. L. No 94-437 § 302, 90 Stat. 1400 (1976) (codified as amended at 25 U.S.C. §1632).

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Supply program and through projects and studies under the WaterSMART Title XVI and Basin Studies programs. Under the Rural Water Supply program, Reclamation collects information on water supply needs—including drinking water supply needs—for congressionally authorized rural water supply projects. The agency also collects information on needs through feasibility studies conducted for potential rural water supply projects, including studies on drinking water supply needs. In addition, Reclamation collects information on needs to modify dams for dam safety purposes. Specifically, as of May 2017, Reclamation manages 492 dams and has identified 15 dams as high- and significant-risk dams that are in need of modification to reduce risk to communities below the dams, at a cost of approximately \$1.25 billion. According to Reclamation officials we interviewed, the agency estimates an additional 6 to 10 dams will require modification for dam safety purposes within the next 3 to 4 years, but Reclamation has not developed the overall cost estimate to address the safety modifications for these dams.<sup>35</sup>

- **FEMA.** The agency collects information on hazard mitigation projects for drinking water and wastewater infrastructure from states where the President has declared a major disaster. FEMA tracks funding through a category system that may include general types of facilities in each category, but the agency does not specifically track drinking water and wastewater infrastructure projects.
- **Economic Development Administration.** The Economic Development Administration collects applications for drinking water and wastewater infrastructure projects from distressed communities for revitalization, expansion, or upgrade of drinking water and wastewater infrastructure, among other projects. The agency collects information on the drinking water and wastewater infrastructure projects it funds in its Operations Planning and Control System. According to agency officials, in fiscal year 2016, the Economic Development Administration provided approximately \$14.4 million in funding for 10 drinking water and wastewater infrastructure projects nationwide.

Four of the six states we selected for review—New Mexico, New York, North Dakota, and Tennessee—have collected data on drinking water

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<sup>35</sup>According to FEMA documents, dams assigned the significant hazard potential classification are those dams where failure or operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Dams assigned the high hazard classification are those where failure or problems with operation will probably cause loss of human life.



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and wastewater infrastructure projects or needs through their own surveys of communities or statewide studies, in addition to participating in EPA's assessments. New Mexico annually collects capital improvement plans for water and wastewater infrastructure projects, as does Tennessee. New York conducted a one-time statewide assessment of its water needs for 2008 to 2028. North Dakota biennially surveys its communities for their drinking water infrastructure projects but does not collect wastewater infrastructure projects. The other two selected states—Alaska and California—participated in EPA's assessment but did not independently collect data on drinking water and wastewater infrastructure needs. Appendix II provides more details of the four states' efforts to collect information on their drinking water and wastewater infrastructure needs.

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## Federal Agencies Provide Technical Assistance and Funding to Support State and Local Planning for Future Drinking Water and Wastewater Infrastructure Needs

Of the eight federal agencies we reviewed, three—the Corps, Reclamation, and FEMA—provide technical assistance and funding to support planning efforts in the selected states for future conditions that may affect drinking water and wastewater infrastructure needs. The three agencies' efforts have usually involved developing or updating documents such as state water plans, hazard mitigation plans, flood management plans, or drought plans. The remaining five federal agencies have at times been involved in long-term planning for such conditions and may provide grant funding to help support such work, but they do not have established programs that offer technical assistance or funding for such purposes.

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## Corps Support for State Planning

### Future conditions that may affect drinking water and wastewater infrastructure needs

According to federal and state agency documents and officials, future conditions that may affect drinking water and wastewater infrastructure needs include:

- Population growth may require new wells or expanded reservoirs to provide additional drinking water supply and may also require additional wastewater treatment capacity.
- Drought can necessitate constructing new pipelines to connect to additional sources of water.
- Flooding, sea level rise, and storm surges may necessitate construction of flood walls or other protective infrastructure to avert damage to drinking water and wastewater treatment plants and to prevent sewers from overflowing and contaminating drinking water sources. Wastewater treatment plants are particularly susceptible to flooding because they are generally built in low-lying areas near bodies of water so wastewater can be gravity fed from higher elevations to lower elevations and so treatment plants can easily discharge water after treating it.
- Land surface changes, including coastal erosion or melting of permafrost (subsoil that is normally permanently frozen, found in about 85 percent of Alaska), may require relocating facilities or reinforcing drinking water or wastewater pipelines.

Source: GAO. | GAO-17-559

The Corps helps selected state and local governments plan for future conditions that may affect drinking water and wastewater infrastructure needs. The Corps does this in part by conducting various studies under such programs as the Section 22 Planning Assistance to States program and the Section 14 Emergency Streambank and Shoreline Protection program, and by conducting studies to reallocate water storage in its reservoirs under the Water Supply Act of 1958. Examples of Corps assistance with selected state and local planning include the following:

- In Tennessee, local governments requested that the Corps study the reallocation of reservoir storage space for the entities' drinking water needs. Three utilities in Tennessee requested the study of the J. Percy Priest Reservoir to determine whether space in the reservoir could be reallocated for municipal water supply to meet future demand arising from population growth and development.<sup>36</sup> The Corps initiated the study in 2014, and, according to agency officials, as of May 2017 was analyzing the future economic and environmental effects of several alternatives for reallocating storage in the reservoir. According to agency officials, the Corps plans to finalize its report in May 2018 and include its recommendation on which alternative, if any, should be analyzed further for possible implementation.
- The state of Tennessee, as a result of historic drought conditions in 2007 and 2008, created its Water Resources Technical Advisory Committee—which included officials from the Corps, Tennessee Valley Authority, and the U.S. Geological Survey—to improve regional water supply planning for future drought conditions and population growth. The committee developed several state and regional water resource management plans, updated the state-wide drought contingency plan, and developed drought contingency plan guidance for community drinking water and wastewater treatment systems in Tennessee.<sup>37</sup>

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<sup>36</sup>U.S. Army Corps of Engineers, Nashville District, *J. Percy Priest Lake, Tennessee Water Supply Storage Reallocation Report and Integrated Environmental Assessment*, draft (Nashville, TN: September 2016). This water supply storage reallocation study was initiated by the Corps' Nashville District Office due to requests for additional storage from multiple municipal water supply users (City of Murfreesboro, Consolidated Utility District, and Town of Smyrna), all located in Rutherford County, Tennessee.

<sup>37</sup>Tennessee Department of Environment and Conservation, *Guidance for Developing Community Water System Drought Management Plans* (Nashville, TN: December 2009).

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- The City of Minnewaukan, North Dakota, received assistance in 2010 through the Corps' Section 22 Planning Assistance to States program to identify alternatives for flood risk reduction, including alternatives to improve the resiliency of the city's drinking water and wastewater infrastructure because of flooding.<sup>38</sup> The Corps recommended relocating a portion of the city, including key drinking water and wastewater infrastructure. According to North Dakota officials, the city was then able to use funding from FEMA's Hazard Mitigation Grant program, Commerce's Economic Development Administration, HUD's Community Development Block Grant program, and the North Dakota Drinking Water SRF to implement the relocation.
  - In Alaska, in 2007, a state workgroup composed of state and federal officials, including officials from the Corps and the Denali Commission,<sup>39</sup> was tasked to develop an action plan addressing the effects of climate change on coastal and other vulnerable communities in Alaska.<sup>40</sup> The workgroup was part of a larger effort created by the Governor in 2007 to lead the preparation and implementation of an Alaska climate change strategy to respond to risks to infrastructure, including water and wastewater infrastructure, from permafrost degradation, erosion, and flooding. From 2005 to 2009, the Corps conducted a baseline erosion assessment to determine the vulnerabilities of Alaskan communities to coastal erosion that helped inform the workgroup's action plan. The assessment identified 26 communities whose viability was threatened by erosion.<sup>41</sup> As a result, in 2009, the workgroup recommended developing a methodology to prioritize state and federal funding for projects to protect existing infrastructure, including drinking water and wastewater infrastructure, from risks due to permafrost degradation,

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<sup>38</sup>U.S. Army Corps of Engineers, St. Paul District, *Minnewaukan Flood Risk Reduction Alternative Analysis* (St. Paul, MN: September 2010).

<sup>39</sup>Since its establishment in 1998 by statute, the Denali Commission has awarded over \$1 billion in federal grants to help develop Alaska's remote communities.

<sup>40</sup>In 1998, the Denali Commission Act established the Denali Commission as a federal agency with the statutory purpose of providing to rural areas of Alaska job training and economic development services, rural power generation and transmission facilities, modern communication systems, water and sewer systems, and other infrastructure needs. Denali Commission Act of 1998, Pub. L. No. 105-277, div. C, tit. III (1998).

<sup>41</sup>U.S. Army Corps of Engineers, Alaska District, *Alaska Baseline Erosion Assessment: Study Findings and Technical Report* (Elmendorf AF Base, AK: March 2009).

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erosion, and flooding.<sup>42</sup> To address the recommendation, as of March 2017, using funding provided by the Denali Commission, the Corps was collaborating with the University of Alaska-Fairbanks to collect additional data on erosion and flooding.<sup>43</sup> The Corps and the University of Alaska-Fairbanks plan to use the data to develop an index for the aggregate risk of permafrost degradation, erosion, and flooding on infrastructure, including drinking water and wastewater infrastructure, in Alaskan communities by 2018.

- After Superstorm Sandy in 2012, New York’s legislature passed the Community Risk and Resiliency Act in 2014, directing state agencies to consider risks from sea level rise, flooding, and storm surges in their facility siting, permitting, and funding decisions, among other things. The act applies to drinking water and wastewater infrastructure projects, including those funded by the state’s Drinking Water and Clean Water SRF programs.<sup>44</sup> In implementing the act, New York adopted regulations in February 2017 that established sea level rise projections, and the state will require applicants for certain state programs to demonstrate that they have taken sea level rise into account for project planning.<sup>45</sup> The Corps participated in a state study that informed these projections and provided technical assistance.<sup>46</sup>

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## Reclamation Support for State Planning

Reclamation has assisted selected states in planning for future conditions that affect water and wastewater infrastructure, in part by conducting studies such as an examination of future water supply and demand.

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<sup>42</sup>Alaska Immediate Action Workgroup, *Recommendations to the Governor’s Subcabinet on Climate Change* (Alaska: March 2009). We reported on federal and state efforts to address these issues in GAO, *Alaska Native Villages: Limited Progress Has Been Made on Relocating Villages Threatened by Flooding and Erosion*, GAO-09-551 (Washington, D.C.: Jun. 3, 2009).

<sup>43</sup> U.S. Army Corps of Engineers and the Denali Commission, *Interagency Agreement Number 17FED1Jan16-0000-001* (March 24, 2017).

<sup>44</sup>Community Risk and Resiliency Act, 2014, N.Y. Laws. ch. 355 § 15 (codified at. N.Y. Evtl. Conserv. Law § 70-0117).

<sup>45</sup>N.Y. Comp. Codes R. & Regs. tit. 6, § 15.

<sup>46</sup>Rosenzweig, C., W. Solecki, A. DeGaetano, M. O’Grady, S. Hassol, P. Grabhorn (Eds.), *Responding to Climate Change in New York State: The ClimAID Integrated Assessment for Effective Climate Change Adaptation. Technical Report*, New York State Energy Research and Development Authority (Albany, New York: 2011) and Horton, R., D. Bader, C. Rosenzweig, A. DeGaetano, and W. Solecki, *Climate Change in New York State: Updating the 2011 ClimAID Climate Risk Information*, New York State Energy Research and Development Authority (Albany, New York: 2014).

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Examples of selected state and local planning with Reclamation assistance include the following:

- In California, Reclamation provided assistance to the state and to several local communities to conduct basin studies examining future water supply and demand in several river basins. For example, Reclamation partnered with the state and several local authorities to examine the impact of rising sea levels, drought, and increasing population, among other conditions, on future water supply and water quality in the Sacramento River Basin, the San Joaquin River Basin, and the Tulare Lake Basin.<sup>47</sup> The basins study completed in March 2016 found that the San Joaquin and Tulare Lake basins faced the risk of future deficits in water supply, and that sea level rise would pose a threat to municipal water supply and water quality. In addition, Reclamation has helped fund planning, design, and construction of local projects to reuse wastewater through its Title XVI program.<sup>48</sup> For example, Reclamation has provided \$20 million to plan and construct a water recycling effort by the City of Watsonville, California, and the Pajaro Valley Water Management Agency. By providing recycled water for irrigation, the project is intended to reduce overdraw of groundwater from aquifers, which can lead to contamination of the aquifers if seawater intrudes into the groundwater.<sup>49</sup> The recycled water blends discharge from the city's wastewater treatment plant with higher-quality water and distributes it to irrigate a portion of more than 6,000 acres of farm land.
- In New Mexico, Reclamation also assisted with several basin studies. For example, the agency helped the City and County of Santa Fe in New Mexico complete a basin study in 2015 to assess variations in

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<sup>47</sup>U.S. Department of the Interior Bureau of Reclamation, State of California Department of Water Resources, El Dorado County Water Agency, Stockton East Water District, California Partnership for the San Joaquin Valley, and Madera County Resource Management Agency, *Sacramento and San Joaquin Rivers Basin Study* (March 2016).

<sup>48</sup>Title XVI of the Reclamation Wastewater and Groundwater Study and Facilities Act, Pub. L. No. 102-575, Tit. XVI, § 1602, 106 Stat. 4663, 4664, as amended, provides authority for Reclamation's water recycling and reuse program, referred to as "Title XVI." Through the Title XVI program, Reclamation identifies and investigates opportunities to reclaim and reuse wastewaters and naturally impaired ground and surface water in the 17 western states and Hawaii. Title XVI includes funding for the planning, design, and construction of water recycling and reuse projects, on a project-specific basis, in partnership with local government entities.

<sup>49</sup>An aquifer is a water-bearing rock formation that readily transmits water to wells and springs.

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available water supply stemming from climate change and other factors.<sup>50</sup> The study found that the Santa Fe area's population is expected to increase by about 80 percent by 2055 and faces a water shortfall if actions are not taken. The study also identified potential adaptation strategies to help meet the projected demand for water over the next 40 years. Following up on a project identified in the basin study, Reclamation's Title XVI program provided funding to the City and County of Santa Fe for a 2016 study of the feasibility of reusing wastewater as drinking water and for replenishing aquifers for future water supply.<sup>51</sup> In addition, Reclamation and USDA provided technical assistance to the state and communities as they updated New Mexico's regional water plans. For example, Reclamation and USDA officials served on the steering committees that helped develop the 2016 updates for the San Juan Basin and Jemez Y Sangre Regional Water Plans.<sup>52</sup>

- In North Dakota, Reclamation conducted a study in September 2012 and provided data that helped inform the state's biennial state water plan. The plan identifies drinking water infrastructure projects intended to address both current and future water supply challenges, including challenges posed by flooding and drought.<sup>53</sup> As an example of its contribution to the state's water plan, in 2012, Reclamation estimated the projected demand for water in 10 counties serviced by North Dakota's Northwest Area Water Supply Project between 2010 and 2060, including demand resulting from changes in population and climate change.<sup>54</sup>

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<sup>50</sup>U.S. Department of the Interior Bureau of Reclamation, City of Santa Fe, and Santa Fe County, *Santa Fe Basin Study: Adaptations to Projected Changes in Water Supply and Demand* (August 2015).

<sup>51</sup>U.S. Department of the Interior Bureau of Reclamation, City of Santa Fe, and Santa Fe County, *Santa Fe Water Reuse Feasibility Study*, draft (September 2016).

<sup>52</sup>State of New Mexico Interstate Stream Commission and Office of the State Engineer, *San Juan Basin Regional Water Plan* (Santa Fe, NM: September 2016). State of New Mexico Interstate Stream Commission and Office of the State Engineer, *Jemez y Sangre Regional Water Plan* (Santa Fe, NM: November 2016).

<sup>53</sup>North Dakota State Water Commission, *North Dakota Water Development Report: An Update to the 2015 State Water Plan* (Bismarck, ND: January 2017) and North Dakota State Water Commission, *2015 North Dakota State Water Management Plan* (Bismarck, ND: January 2015).

<sup>54</sup>U.S. Department of the Interior Bureau of Reclamation, North Dakotas Area Office, Great Plains Region, *Water Needs Assessment Technical Report: Northwest Area Water Supply Project* (September 2012).

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## FEMA Support for State Planning

FEMA has provided funding to reduce or eliminate long-term risks to drinking water and wastewater infrastructure from natural disasters, as well as technical assistance to communities to help them plan for disaster resilience of drinking water and wastewater infrastructure. Examples of selected state and local planning with FEMA assistance include the following:

- California's 2013 hazard mitigation plan incorporates potential threats to drinking water and wastewater infrastructure.<sup>55</sup> FEMA's Hazard Mitigation Grant Program has provided funding for local projects in California since 2013 to replace or reinforce water storage tanks to mitigate wildfire or earthquake risks identified in the plan.
- FEMA, along with other agencies, provided technical assistance for a 2013 study conducted by New York State that reviewed the resiliency of wastewater infrastructure on Long Island.<sup>56</sup> The study made recommendations to improve and expand critical wastewater infrastructure in Nassau and Suffolk Counties to make infrastructure more resilient to storms and flood events.<sup>57</sup>

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## Agencies Have Taken Certain Actions to Coordinate Project Funding While Facing Some Challenges

Federal and state agencies in the six selected states have taken certain actions to coordinate funding for drinking water and wastewater infrastructure projects. Yet, the federal and state agencies face challenges that make it difficult for federal and state agencies to use all available federal funds. Federal agencies have also taken some actions to help them address some of the challenges they faced in funding projects. For example, in 2017, EPA and USDA issued a joint memorandum that identified practices to improve state-level coordination on drinking water and wastewater infrastructure that is intended to help improve collaboration among federal and state agencies.

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<sup>55</sup>California Governor's Office of Emergency Services, 2013 *State of California Multi-hazard Mitigation Plan* (Mather, CA: 2013).

<sup>56</sup>The Corps, EPA, and HUD also provided technical assistance for the study.

<sup>57</sup>New York State Department of Environmental Conservation, *Coastal Resiliency and Water Quality in Nassau and Suffolk Counties: Recommended Actions and a Proposed Path Forward* (Albany, NY).

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## Federal and State Agencies Have Taken Certain Actions to Coordinate Funding for Drinking Water and Wastewater Infrastructure Projects

In the selected states, federal and state agencies took some actions to coordinate funding for drinking water and wastewater infrastructure projects. We identified several types of coordination actions that some federal and state agencies had undertaken since 2011 in some selected states. These actions are consistent with key considerations for implementing interagency collaborative mechanisms and practices to enhance and sustain collaboration that we have identified in our previous work.<sup>58</sup> Examples of coordination actions taken by the six selected states and various federal agencies include the following:

- **Including all relevant participants.** Participation by all relevant participants in an interagency coordinating group is one of the key considerations we have identified for implementing such a collaborative mechanism.<sup>59</sup> With the exception of Tennessee, five of the selected states had coordinating groups. Certain federal and state agencies have participated in interagency coordinating groups that met at least once annually.<sup>60</sup> For example, California's group meets quarterly, according to federal and state officials, and includes officials from USDA, Reclamation, the state's SRF and Community Development Block Grant programs, the state's Department of Water Resources, and other state programs. Alaska's group focuses on funding programs for small communities (those with less than 1,000 people), which are primarily tribal funding programs for Alaska Native villages. The group meets monthly, according to federal and state officials, and includes USDA, Indian Health Service, EPA, the Alaska Native Tribal Health Consortium—a statewide tribal organization that manages most of the design and construction of sanitation facilities in rural Alaska—and Alaska's Department of Environmental Conservation, which also manages the SRF program.
- **Documenting written agreements between the agencies.** Having written guidance and agreements documenting how agencies will collaborate is a key consideration of interagency collaborative

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<sup>58</sup>For key considerations, see [GAO-12-1022](#). For leading practices, see [GAO-06-15](#).

<sup>59</sup>[GAO-12-1022](#).

<sup>60</sup>According to a state official in Tennessee, the state did not have a coordinating group because it did not have leadership to organize one. In North Dakota, agencies/agency officials administering certain programs participated in a group until 2014, according to federal and state officials; federal and state officials said they continued to coordinate through a state agency and resumed the group's meetings in 2017.



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mechanisms identified in our prior work.<sup>61</sup> In three of the selected states—California, New York, and North Dakota—federal and state agencies developed written agreements for their coordinating groups. For example, the 1998 agreement between federal and state agencies in California sought to encourage more efficient use of funds and reduce administrative costs for the agencies and their funding recipients. Federal and state agencies agreed to, among other things, provide staff and leadership to form the state’s coordinating group, meet regularly to foster cooperation in project funding, remove as many barriers as possible in program regulations, and jointly fund projects when feasible and efficient. Similarly, New York’s 2003 agreement between federal and state agencies sought to simplify the application process and formalize coordination of jointly funded drinking water and wastewater activities. Among other things, the participating agencies agreed to establish an interagency coordinating group to meet regularly, facilitate exchange of information among agencies, jointly fund projects when feasible and appropriate, and provide outreach on funding programs to potential recipients. Agencies in North Dakota signed a memorandum of understanding with federal agencies in 1997 with the purpose of establishing greater communication and coordination on water supply development funding in the state. The memorandum stated that the agencies would meet at least biannually but did not include other agreements about how they would coordinate.

- **Sustaining leadership for the group.** Sustaining leadership is another key consideration of interagency collaborative mechanisms we previously identified. According to agency documents and officials, federal and state agencies had established leadership for the interagency coordinating groups in three of the selected states—California, New Mexico, and New York. According to federal and state officials, a state agency provided leadership for North Dakota’s coordinating efforts.
- **Bridging organizational cultures.** Bridging organizational cultures is a key consideration of interagency collaborative mechanisms we identified. One way agencies can bridge organizational cultures is to adopt common application requirements or procedures. Federal and state agencies in five states—Alaska, California, New Mexico, New York, and Tennessee—had taken at least one action toward adopting common application requirements or procedures. For example, in

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<sup>61</sup>[GAO-12-1022](#).

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California and New York, agencies developed a common income survey for determining funding eligibility.

- **Identifying resources.** Identifying the resources needed to initiate or sustain the collaborative effort is a key consideration of interagency collaborative mechanisms we identified. Some agencies in the selected states took actions consistent with this key consideration. For example, federal and state agencies conducted joint marketing and outreach to communities and utilities about the agencies' funding opportunities in five of the states—Alaska, California, New Mexico, New York, and North Dakota. In addition, officials from federal and state agencies in all of the selected states said they shared some information among themselves on infrastructure project applications that were funded or being considered for funding, either through their coordinating groups or informally between individual programs. For example, agencies in Alaska shared information on projects for small Alaska villages, and in California agencies shared information on jointly funded projects. In New Mexico, USDA and the state's Community Development Block Grant programs began sharing information when they joined the state's coordinating group in 2014 and 2017, respectively. Furthermore, agencies in some selected states jointly funded projects with other federal or state agencies. For example, according to federal and state officials in New York, agencies often worked together to make projects more affordable to communities by combining grant and loan funds from multiple agencies. In Tennessee, USDA and the SRF programs have jointly funded projects with the state's Community Development Block Grant program, but state and federal officials said their agencies generally try to fully fund projects, or phases of them, themselves.

Not all federal and state agencies in selected states took action to coordinate for various reasons, such as timing and resources, according to federal and state agency officials. For example, some of the federal agencies that provide funding for drinking water and wastewater infrastructure did not participate in all state coordinating groups. Reclamation officials, for instance, did not participate in New Mexico's coordinating group because the state coordinating group was in the process of being organized and Reclamation had not been asked to participate, according to agency officials. In another example, the Indian Health Service did not participate in California's coordinating group because the group primarily identifies and addresses needs in nontribal communities, according to agency officials. The Economic Development Administration, state agencies managing FEMA Hazard Mitigation Grant program funds, and the Corps also did not participate in any of the

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groups, in part because they have limited roles or funding for drinking water or wastewater infrastructure.<sup>62</sup> In addition, some selected states did not develop formal written agreements for their coordinating groups or use common procedures or surveys. For example, New Mexico was in the process of organizing its coordinating group and planned to consider a written agreement once the group was established, according to state officials. In addition, while some states had developed common procedures or surveys, not all agencies used them. For example, state officials said that California's common income survey was not used by the state's Community Development Block Grant program because of differences in survey requirements and the Community Development Block Grant's definition of low- and moderate-income persons.

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### Several Challenges to Funding Projects Make It Difficult for Agencies to Provide All Available Federal Funds in Selected States

In the selected states, four key challenges can make it difficult for federal and state agencies to provide all federal funds available for drinking water and wastewater infrastructure projects: limited community demand for loan funding, limited technical or financial capacity of some communities, differing requirements among federal and state funding programs, and difficulty developing a set of projects ready for funding.

Federal and state officials face the following key challenges to funding projects.

- **Limited community demand for loan funding.** USDA officials we interviewed in all of the selected states, as well as state program officials in five of the selected states, said that communities prefer grants, which do not need to be repaid, and are reluctant to take on loans and pay interest on them. Because the USDA Water and Waste Disposal loan and grant program and state SRF programs do not usually fund projects entirely with grants, finding applicants for state and federal programs can be difficult. In addition, USDA officials in New Mexico, New York, and California cited competition from state-funded grant programs as a challenge for federal and state agencies to use available loan and grant funding. For example, according to

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<sup>62</sup>For example, FEMA funds are limited to areas with federally declared disasters, and the Corps' funding is generally authorized for specific projects in law. In addition, although projects funded with Economic Development Administration grants may include water infrastructure, the water infrastructure would be a secondary effect of an economic development project. Economic Development Administration funding for drinking water or wastewater infrastructure projects is also relatively low compared to the other agencies we reviewed.

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USDA funding data and a USDA official in New York, USDA's New York state office did not obligate \$3.5 million of the grant funds available in 2015 and 2016 because a state program provided grants to four communities that had already been funded with a combination of USDA loan and grant funds.

- **Communities' limited technical or financial capacity.** In five of the selected states, some of the federal and state officials said that some communities have limited technical or financial expertise or capacity for loans, which is a challenge for agencies because it can prevent communities from identifying projects or applying to state and federal agencies for project funding. For example, state SRF program officials in New Mexico and state Community Development Block Grant program officials in New York noted that many small communities do not have the technical capacity to evaluate their drinking water or wastewater systems and to plan projects. State SRF program officials in Tennessee also said that many communities do not have the financial capacity to repay loans and therefore may not qualify for federal and state loan programs.
- **Differing requirements among funding programs.** In five of the selected states, federal or state officials said that differing application requirements and processes among funding programs are a challenge. For example, differing requirements can make it difficult for federal and state agencies to jointly fund projects or for applicants to apply to multiple programs for funding. A USDA official in New Mexico, for example, noted that differing requirements for applicants' preliminary engineering reports have been a challenge, as did officials from the Alaska Native Tribal Health Consortium, which administers parts of Indian Health Service's program in Alaska. In addition, an Indian Health Service official in North Dakota and state Community Development Block Grant program officials in California and Tennessee described challenges with agencies' differing requirements for environmental reviews. They each identified projects they funded between fiscal years 2011 and 2016 that involved some duplication of environmental analysis—either an additional environmental review or additions to other programs' environmental reviews; this duplication can increase the length and cost of projects, according to officials.
- **Difficulty developing a set of projects ready for funding.** Federal and state officials we interviewed in four states noted that even though communities in those states may have drinking water or wastewater infrastructure needs, they may not have identified specific projects or developed them to the extent needed to apply for funding.

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For example, state SRF program officials in California and Alaska and USDA officials in Tennessee said that it is hard for communities to put together the plans they need to get a project ready for funding, and that this can be more difficult than construction of the project. Similarly, Indian Health Service officials in California noted that it is challenging for communities to develop projects that Indian Health Service or other agencies are likely to fund. For example, tribal projects may be constrained by the need to obtain easements across nontribal lands, as well as concerns about water rights.

These challenges can make it difficult for federal and state agencies to provide all funds available for loans and grants to communities. For example, USDA state offices in the selected states did not have enough applicants with projects that were ready to fund, and the offices did not lend a total of about \$193 million in loan funding available for drinking water and wastewater infrastructure projects from fiscal years 2012 through 2016 to communities in those states. Specifically, in fiscal year 2016, USDA's state office for California was unable to lend about \$21 million in available USDA loan funding to communities. USDA's state offices for New Mexico, New York, and Tennessee each were unable to lend about \$10 million to \$11 million in available USDA loan funding, and Alaska was unable to lend about \$6 million in loan funding. North Dakota's state office, however, lent all of its available loan funding to communities, as well as an additional \$7 million for loans in fiscal year 2016. Unlike other programs we reviewed that allocate funding directly to states, such as EPA's SRF and HUD's Community Development Block Grant programs, USDA's Water and Waste Disposal Program allocates funding to its state offices, which in turn loan or grant funding for projects in local communities. The state offices must return funds that are not obligated by August to the agency's headquarters for reallocation to other state offices. According to USDA officials, the purpose of this process is to ensure funds are used nationwide in an effective, timely, and efficient manner for projects that are ready to receive funding, and the program maintains a nationwide backlog of applications at any given time.<sup>63</sup> USDA headquarters officials said that in general, state offices return funds in part because there are not enough projects in a state that are ready to be funded in that fiscal year and not because of lack of need for the funding.

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<sup>63</sup>USDA officials also noted that USDA state offices that return funds may receive some or all of the funds back by the end of the fiscal year. However, when a state returns more funds to headquarters than they receive back by the end of the year, this means that the state has not used all available funds from USDA for drinking water and wastewater projects.

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Two of the selected states also had difficulties using all available SRF program funding in recent years. In a 2014 report, EPA's Office of Inspector General found that in California and New Mexico—two of the five states the Office of Inspector General reviewed<sup>64</sup>—23 percent and 26 percent, respectively, of the programs' cumulative federal funding remained unspent or unliquidated as of September 2013. According to the report, EPA considers any state with a balance above 13 percent to have a high unliquidated obligation balance.<sup>65</sup> California's and New Mexico's programs had \$401 million in obligated funds that remained unspent—\$358 million and \$43 million, respectively, in unliquidated obligations—according to the report. Among other challenges, according to the report, the Inspector General indicated that unliquidated obligations result from states not having projects that are ready for loan execution or from states funding projects that are not ready to proceed. Staff in all five states reviewed indicated that they had had difficulty in the past getting projects from applicants that were ready to proceed for funding.<sup>66</sup> In addition, EPA's Office of Inspector General cited the availability of other, more attractive funding options for potential applicants as a reason for the difficulties issuing loans in these states.<sup>67</sup> The Office of Inspector General also found that when loans are not issued and hundreds of millions of SRF dollars remain idle, states miss opportunities for improvements to their communities' drinking water infrastructure.

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<sup>64</sup>Environmental Protection Agency, Office of Inspector General, *Unliquidated Obligations Resulted in Missed Opportunities to Improve Drinking Water Infrastructure*, Report No. 14-P-0318 (Washington, D.C.: July 2014). EPA's audit also included the Drinking Water State Revolving Fund programs in Connecticut, Hawaii, and Missouri.

<sup>65</sup>Obligations are definite commitments that create a legal liability of the government for the payment of goods and services ordered or received, or a legal duty on the part of the United States that could mature into a legal liability by virtue of actions on the part of the other party beyond the control of the United States. Unliquidated obligations are the amount of outstanding obligations or liabilities. See GAO, *A Glossary of Terms Used in the Federal Budget Process*, [GAO-05-734SP](#) (Washington, D.C.: September 2005).

<sup>66</sup>EPA found that, generally, the five states reviewed did not have a consistent definition of when projects are ready to proceed. In 2014, EPA defined projects as ready to proceed when they are prepared to begin construction and are immediately ready, or poised to be ready, to enter into assistance agreements.

<sup>67</sup>EPA found that the reasons for states' difficulties issuing loans varied from state to state but that all five states either did not use, or had only recently begun to use, tools for projecting the funds that would be available in the future to help anticipate the number and value of projects needed to be ready for loan execution in any given year.

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USDA and EPA have taken some steps at the national level to increase the use of their funds within states. For example, USDA officials told us that the agency offered training in 2016 for several USDA state offices that were not using their full allocations, and USDA has started working with EPA's national SRF program staff to improve coordination in states that are not using their full USDA allocations. The officials also said that they are planning further outreach to additional USDA state offices in 2017 and plan to work with some EPA regional offices. In 2014, EPA issued a national strategy for reducing unliquidated obligations under the Drinking Water SRF. The strategy outlined six practices for states to use to help liquidate past years' funds and maintain lower levels of unliquidated obligations in future years. The practices include focusing on projects that are ready to proceed. EPA's strategy also emphasized the importance of states' (1) solicitations of water infrastructure projects to protect public health, (2) proactive efforts to help get projects ready to proceed to financing, and (3) efforts to ensure that water systems within their jurisdictions are well informed of the financing opportunities available through the Drinking Water SRF. In 2016, EPA reported that California's Drinking Water SRF program had made substantial progress in its effort to quickly and efficiently expend funds;<sup>68</sup> however, EPA remained concerned about the extent of unliquidated obligations for New Mexico's Drinking Water SRF.<sup>69</sup>

Federal and state agencies within selected states have also taken some actions to help address some of the challenges they face in funding projects. For example, in New York, agencies have helped address communities' preferences for grant funding and limited financial capacity for loans by coordinating to jointly fund projects with a combination of grant and loan funds from different agencies. In addition, agencies have worked together through coordinating groups to help address communities' limited technical capacity. For example, EPA and USDA have jointly funded training and technical assistance in Alaska to address the technical capacity of rural drinking water and wastewater utilities.

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<sup>68</sup>Environmental Protection Agency, Region 9, *Program Evaluation Report, California Drinking Water State Revolving Fund Program, Based on State Fiscal Year 2015, Annual Report* (August 2016). According to EPA's report, California's program had reduced its unliquidated obligations to 11 percent of its federal capitalization grant.

<sup>69</sup>Environmental Protection Agency, Region 6, *Drinking Water State Revolving Loan Fund, New Mexico Final Program Evaluation Report, State Fiscal Year 7/1/14 – 6/30/15* (August 2016). According to EPA's report, New Mexico's program had unliquidated obligations of approximately \$16 million, as of June 2016.

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Furthermore, agencies have developed common application requirements or procedures to help them address the challenge of differing requirements among funding programs. For example, California's coordinating group uses a common funding inquiry form, which a USDA official said is one of the group's most effective actions and saves applicants time. Finally, agencies have shared information and conducted joint outreach to help address difficulties with developing a set of projects ready for funding. For example, North Dakota's State Water Commission takes the lead on conducting outreach to communities to identify drinking water infrastructure projects in the state. The Commission then shares its prioritized list of drinking water projects with other agencies, which work together informally to discuss funding and projects. According to USDA program officials we interviewed in North Dakota, these actions have helped them identify and prioritize projects and provide nearly all of their available funding to communities.

Most recently, to help improve state-level coordination between state SRF programs and USDA state offices on drinking water and wastewater infrastructure project funding, EPA and USDA issued a joint memorandum in February 2017 that outlined five coordination practices that states' SRF programs and USDA state offices are encouraged to use. These practices include participating in a statewide coordinating group, conducting joint marketing or outreach, adopting common application materials, adopting a common environmental review process, and periodically reexamining internal processes to identify opportunities for streamlining and increasing coordination.<sup>70</sup>

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## Agency Comments and Third-Party Views

We provided a draft of this product to all eight agencies for comment. Seven of the agencies, EPA, USDA, HUD, Indian Health Service, the Corps, Reclamation, and FEMA provided technical comments that we incorporated as appropriate. One agency, the Economic Development Agency, did not have any comments.

We also provided appropriate portions of the product to the six states that we reviewed. New Mexico had technical comments that we incorporated as appropriate. Tennessee did not have any comments. The remaining four states did not provide comments.

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<sup>70</sup>Environmental Protection Agency and U.S. Department of Agriculture, *Environmental Review Process Coordination Best Practices* (February 2017).

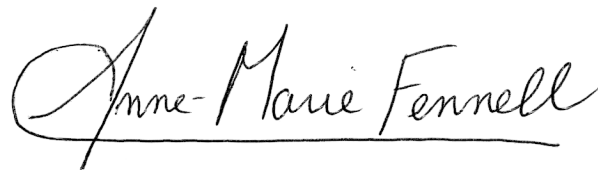


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As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Administrator of the Environmental Protection Agency, the Secretary of Agriculture, the Secretary of Defense, the Secretary of Commerce, the Secretary of Health and Human Services, the Secretary of Homeland Security, the Secretary of Housing and Urban Development, the Secretary of the Interior, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact J. Alfredo Gómez at (202) 512-3841 or [gomezj@gao.gov](mailto:gomezj@gao.gov) or Anne-Marie Fennell at (202) 512-3841 or [fennella@gao.gov](mailto:fennella@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.



Anne-Marie Fennell  
Director, Natural Resources and Environment



J. Alfredo Gómez  
Director, Natural Resources and Environment

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*List of Requesters*

The Honorable Frank Pallone, Jr.  
Ranking Member  
Committee on Energy and Commerce  
House of Representatives

The Honorable Paul Tonko  
Ranking Member  
Subcommittee on Environment  
Committee on Energy and Commerce  
House of Representatives

The Honorable Jared Huffman  
Ranking Member  
Subcommittee on Water, Power and Oceans  
Committee on Natural Resources  
House of Representatives

The Honorable Grace Napolitano  
Ranking Member  
Subcommittee on Water Resources and Environment  
Committee on Transportation and Infrastructure  
House of Representatives

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# Appendix I: Objectives, Scope, and Methodology

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The objectives of our review were to describe (1) how federal agencies and selected states identify drinking water and wastewater infrastructure needs; (2) how federal agencies have supported selected states in planning for future conditions that may affect such needs; and (3) the extent to which federal and state agencies have coordinated in funding drinking water and wastewater infrastructure projects, and any challenges they face in funding these projects.

To address these objectives, we reviewed federal programs in eight agencies, as shown in table 1. We reviewed our previous reports to identify the agencies that provide funding or planning assistance to states or communities for drinking water and wastewater infrastructure and identified eight agencies: the Environmental Protection Agency (EPA), the Department of Agriculture's (USDA) Rural Utilities Service, the Department of Commerce's Economic Development Administration, the Department of Defense's Army Corps of Engineers, the Department of Health and Human Services' Indian Health Service, the Department of Homeland Security's Federal Emergency Management Agency, the Department of Housing and Urban Development (HUD), and the Department of the Interior's Bureau of Reclamation. The programs provide funding or planning assistance to states or communities for drinking water and wastewater infrastructure.

**Table 1: Federal Programs GAO Reviewed That Provide Assistance for Drinking Water and Wastewater Infrastructure Projects**

Department	Agency	Program names	Program administration
-	Environmental Protection Agency	Clean Water State Revolving Fund Drinking Water State Revolving Fund	State agencies
Agriculture	Rural Utilities Service	Water and Waste Disposal Program	Federal state offices
Commerce	Economic Development Administration	Public Works and Economic Development Program	Federal regional offices
Defense	Army Corps of Engineers	Environmental Infrastructure Program Planning Assistance to States	Federal regional offices <sup>a</sup>
Health and Human Services	Indian Health Service	Sanitation Facilities Construction Program	Federal regional offices
Homeland Security	Federal Emergency Management Agency	Hazard Mitigation Grant Program	State agencies
Housing and Urban Development	-	Community Development Block Grant Program <sup>b</sup>	State agencies
Interior	Bureau of Reclamation	Rural Water Supply WaterSMART (Sustain and Manage America’s Resources for Tomorrow)	Federal regional offices

Legend: - = N/A

Source: GAO. | GAO-17-559

<sup>a</sup>We refer to the Corps’ division and district offices as regional offices.

<sup>b</sup>The Department of Housing and Urban Development allocates the majority of Community Development Block Grant funding to eligible metropolitan cities and urban counties, known as entitlement communities; we reviewed the funding allocated to states for distribution to other, generally smaller communities, known as nonentitlement communities.

We reviewed these programs in a nonprobability sample of 6 states—Alaska, California, New Mexico, New York, North Dakota, and Tennessee. We selected these states based on the number of federal agencies that provided funding in the state for drinking water and wastewater infrastructure projects, presence or absence of a formal coordination group, and geographic diversity. Specifically, we determined whether four federal agencies—Reclamation, Corps, Indian Health Service, and Economic Development Administration—funded drinking water and wastewater projects in each of the 50 states from fiscal years 2011 through 2015. We chose these agencies for our selection process because EPA and USDA provide funding in all 50 states and the Federal Emergency Management Agency and HUD could not provide state-level data for drinking water and wastewater infrastructure projects. We then

identified whether states had coordinating groups.<sup>1</sup> To obtain a sample of states with geographic diversity, we sorted states by the four regions of the United States as defined by the U.S. Census Bureau. We then selected states that either had the most federal agencies that provided funding for projects or did not have a coordinating group, and we selected at least 1 state from each Census region.<sup>2</sup>

The sample of states is not generalizable, and the results of our work do not apply to all 50 states; however, they provide illustrative examples of state infrastructure programs. Some of these federal programs are administered directly by the federal agencies through their regional or state offices, while others are administered by state agencies. Therefore, our review included the federal offices and state agencies responsible for overseeing and administering these programs. We conducted site visits to interview federal and state officials in Alaska, California, New Mexico, and Tennessee, and held teleconferences to interview officials in North Dakota and New York. In addition, we interviewed federal officials from the Denali Commission,<sup>3</sup> as well as selected state officials administering

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<sup>1</sup>We identified the presence or absence of a coordination group based on a 2011 survey of states conducted on behalf of the Small Community Water Infrastructure Exchange (SCWIE). SCWIE is a network of water funding officials who come from public and nonprofit environmental funding and technical assistance agencies. It operates under the auspices of the Council of Infrastructure Financing Authorities. See Steven J. Grossman, *A Survey of the States on the Current Level of Activity by Statewide Support Groups Involved in Water Infrastructure Funding and Technical Assistance* (Columbus, OH: July 10, 2015).

<sup>2</sup>The four U.S. Census Bureau Regions are the Midwest, Northeast, South, and West Regions. North Dakota is located in the Midwest Region, New York is located in the Northeast Region, Tennessee is located in the South Region, and New Mexico, California, and Alaska are located in the West Region.

<sup>3</sup>The Denali Commission is a federal agency established with the statutory purpose of providing water and sewer systems, rural power generation and transmission facilities, and modern communication systems, among other things, to rural areas of Alaska.

federal funds from the Appalachian Regional Commission<sup>4</sup> and Delta Regional Authority.<sup>5</sup>

To describe how federal agencies and selected states identify drinking water and wastewater infrastructure needs, we identified federal requirements directing EPA and Indian Health Service to collect information on drinking water and wastewater infrastructure needs, reviewed these agencies' most recent reports on needs,<sup>6</sup> and interviewed EPA and Indian Health Service officials about these efforts. We also reviewed any national, regional, or state reports on needs issued over the last 10 years by the other six federal agencies and the six selected states. Specifically, we reviewed the report of a joint USDA-EPA effort to identify the drinking water and wastewater infrastructure needs of certain communities in the U.S.-Mexico border region,<sup>7</sup> as well as reports on needs issued by 4 of the selected states: New Mexico,<sup>8</sup> New York,<sup>9</sup>

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<sup>4</sup>The Appalachian Regional Commission is a federal agency established by statute to, among other things, develop comprehensive and coordinated plans and sponsor projects to foster the productivity and growth of the Appalachian region, which includes counties in 13 states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

<sup>5</sup>The Delta Regional Authority is a federal agency that works to improve regional economic opportunity by helping to create jobs, build communities, and improve the lives of people in the eight-state Delta region, which includes parts of Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.

<sup>6</sup>Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, EPA 816-R-13-006 (Washington, D.C.: April 2013); Environmental Protection Agency, *Clean Watersheds Needs Survey 2012: Report to Congress*, EPA-830-R-15005 (Washington, D.C.: January 2016); and Department of Health and Human Services, Indian Health Service, Sanitation Facilities Construction Program, *Public Law 86-121 2015 Annual Report* (Rockville, MD: 2015).

<sup>7</sup>Rural Community Assistance Partnership, *U.S.-Mexico Border Needs Assessment and Support Project: Phase II Assessment Report* (Washington, D.C.: July 30, 2015).

<sup>8</sup>New Mexico Department of Finance and Administration, *Infrastructure Capital Improvement Plan*, accessed June 26, 2017, <http://www.state.nm.us/capitalprojects/>, and New Mexico Legislative Finance Committee, *Progress Report: New Mexico Water Projects* (New Mexico: July 27, 2016).

<sup>9</sup>New York State Department of Health, *Drinking Water Infrastructure Needs of New York State* (New York: November 2008) and New York State Department of Environmental Conservation, *Wastewater Infrastructure Needs of New York State* (New York: March 2008).

North Dakota,<sup>10</sup> and Tennessee.<sup>11</sup> To conduct this work, we did not define the concept of need or conduct an independent review of the studies that identify needs for drinking water and wastewater infrastructure, and we did not evaluate the legitimacy of the claims. We assessed the reliability of data in EPA's reports by reviewing documentation on data collection and interviewing agency officials. We determined that the data were sufficiently reliable for the purpose of estimating national needs for drinking water and wastewater infrastructure projects that fall within the scope of EPA's reports. We also assessed the reliability of data from the Indian Health Service's report by interviewing agency officials about the data. We determined the data were reliable for our purposes of reporting total needs.

To describe how the eight federal agencies have supported the selected states in planning for future conditions that may affect drinking water and wastewater infrastructure needs, we reviewed federal and selected state program and planning documents, including basin studies, erosion and sea-level rise studies, and flooding and drought response plans, and we conducted semi-structured interviews with or obtained written responses from federal officials and selected state officials. State agencies included state water boards and commissions, infrastructure funding agencies, and emergency management agencies as appropriate. We used these documents and interviews to identify examples where federal agencies have assisted selected states and local communities in planning for future conditions that might affect their drinking water and wastewater infrastructure needs.

To describe the extent to which the eight federal agencies and selected states have coordinated in funding projects and any challenges they face, we reviewed federal and state program documents, interagency agreements, and project data and interviewed federal and state agency officials on project funding and coordination, as well as on challenges they face in funding projects. We used this information to (1) assess whether and how federal and state agencies have implemented leading collaboration practices and key considerations for collaborative mechanisms in the selected states, (2) examine whether coordination has

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<sup>10</sup>North Dakota State Water Commission, *2017-2019 Water Development Report, An Update to the 2015 State Water Plan* (Bismarck, ND: January 2017).

<sup>11</sup>Tennessee Advisory Commission on Intergovernmental Relations, *Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs* (Nashville, TN: Aug. 30, 2016).

helped agencies efficiently use available federal funding for projects, and (3) identify challenges to funding projects. We used key considerations from our previous work on interagency collaborative mechanisms: including all relevant participants, documenting written guidance and agreements, sustaining leadership, clarifying roles and responsibilities, bridging organizational cultures, identifying resources, and defining outcomes and accountability.<sup>12</sup> We identified actions that agencies had taken consistent with these key considerations. We also used leading collaboration practices from our previous work, such as identifying and addressing needs by leveraging resources, as appropriate. To examine whether coordination has helped agencies use available federal funding for projects efficiently, we looked for and analyzed examples of projects jointly funded by multiple federal programs and unfunded or delayed projects. We obtained and analyzed funding data for fiscal year 2016 for the eight agencies and assessed the reliability of the data by obtaining information from agency officials. In some cases, agencies provided obligation data, while other agencies provided budget allocation data. We determined the data were reliable for our purposes of reporting total funding available by agency. We reviewed a report by EPA's Office of Inspector General on the unliquidated obligations in five state Drinking Water SRFs.<sup>13</sup>

We conducted this performance audit from March 2016 to September 2017 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.

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<sup>12</sup>GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012) and GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

<sup>13</sup>Environmental Protection Agency, Office of Inspector General, *Unliquidated Obligations Resulted in Missed Opportunities to Improve Drinking Water Infrastructure*, Report No. 14-P-0318 (Washington, D.C.: July 16, 2014).



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# Appendix II: Selected States' Assessments of Their Drinking Water and Wastewater Infrastructure Needs

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Four of the six states that we selected for review developed assessments of their drinking water and wastewater infrastructure needs.<sup>1</sup> The details of their assessments are included below.

- **New Mexico.** The New Mexico Department of Finance and Administration annually collects 5-year capital improvement plans from local governments and tribes through a web-based process. The purpose of collecting these plans is to establish planning priorities for anticipated capital projects and encourage entities to plan for, fund, and develop infrastructure at a pace that sustains their activities. The plans include time frames, estimated costs, and the details of each proposed capital improvement project for drinking water or wastewater infrastructure, including repair or replacement of existing infrastructure and the development of new infrastructure. The plans also include projects for dams and water infrastructure for agriculture, which are excluded from the Environmental Protection Agency's (EPA) assessments.<sup>2</sup> The state lists the projects on its Infrastructure Capital Improvement Plan website.<sup>3</sup> In 2016, the New Mexico Legislative Finance Committee analyzed the state and local infrastructure capital improvement plans for 2017 to 2022 and identified \$3.2 billion in drinking water and wastewater infrastructure projects.<sup>4</sup>
- **New York.** In 2008, New York's Departments of Health and Environmental Conservation conducted one-time assessments of the state's drinking water and wastewater infrastructure needs over the next 20 years. The departments conducted the drinking water study because EPA's drinking water needs survey underreported valid

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<sup>1</sup>To conduct this work, we did not define the concept of need or conduct an independent review of the studies that identify needs for drinking water and wastewater infrastructure, and we did not evaluate the legitimacy of these claims.

<sup>2</sup>Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment*, EPA 816-R-13-006 (Washington, D.C.: April 2013). As presented here, EPA's estimates of drinking water infrastructure needs by state do not include those of American Indian and Alaska Native village systems. Environmental Protection Agency, *Clean Watersheds Needs Survey 2012: Report to Congress*, EPA-830-R-15005 (Washington, D.C.: January 2016). EPA does not estimate the wastewater infrastructure needs of American Indian and Alaska Native village systems.

<sup>3</sup>New Mexico Department of Finance and Administration, *Infrastructure Capital Improvement Plan*, accessed June 26, 2017, <http://www.state.nm.us/capitalprojects/>.

<sup>4</sup>New Mexico Legislative Finance Committee, *Progress Report: New Mexico Water Projects* (New Mexico: July 27, 2016).

projects, and they conducted the wastewater study because of the need to develop a sustainable infrastructure funding program at the federal, state, and local levels. The assessments included needs that were part of EPA's drinking water and wastewater assessments. They also included estimates of the costs of certain other needs that EPA excludes because they are not eligible for the EPA's State Revolving Fund program; these include the costs to repair and replace dams and private wells. Specifically, New York's drinking water needs assessment estimated a cost of \$533.6 million to rehabilitate the state's approximately 511 dams used for water supply purposes, as well as a cost of \$1.8 billion to replace or rehabilitate almost all of the state's 1.5 million private drinking water wells over the next 20 years. In addition, the state's wastewater needs assessment estimated a cost of \$693 million to replace faulty residential septic systems in 150 municipalities with community wastewater treatment systems. Together, the state's assessments estimated a total of \$74.9 billion to repair, replace, and update New York's existing drinking water and wastewater infrastructure over the next 20 years.<sup>5</sup>

- **North Dakota.** North Dakota's State Water Commission surveys communities on their planned drinking water infrastructure projects for the commission's biennial State Water Plan. The purpose of the survey is to provide the commission with an updated inventory of water projects and programs that become part of the commission's budget request to North Dakota's governor and legislature. The commission prioritizes the projects and publishes the rankings. The inventory does not include drinking water or wastewater infrastructure replacement needs but contains drinking water infrastructure projects not included in EPA's assessments, such as repair or rehabilitation of dams and reservoirs. In the state's most recent assessment, the commission estimated a cost of \$645 million to address the drinking water infrastructure projects identified in the state.<sup>6</sup>
- **Tennessee.** As required by state statute, the Tennessee Advisory Commission on Intergovernmental Relations annually surveys local officials on their infrastructure projects, including drinking water and

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<sup>5</sup>New York State Department of Health, *Drinking Water Infrastructure Needs of New York State* (New York: November 2008) and New York State Department of Environmental Conservation, *Wastewater Infrastructure Needs of New York State* (New York: March 2008).

<sup>6</sup>North Dakota State Water Commission, *2017-2019 Water Development Report: An Update to the 2015 State Water Plan* (Bismarck, ND: January 2017).

wastewater infrastructure, with a capital cost of at least \$50,000.<sup>7</sup> The purpose of the assessment is to identify projects necessary to help local communities with economic development opportunities. To be included in the Commission's report, projects must be in the conceptual, planning and design, or construction phase at some time during the next 5 years and need to be either started or completed during that period. In 2016, the commission estimated \$3.3 billion of drinking water and wastewater infrastructure needs for July 2014 through June 2019.<sup>8</sup>

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<sup>7</sup>The Tennessee Advisory Commission on Intergovernmental Relations was created in July 1978 by Chapter 939 of the Tennessee Public Acts of 1978 to serve as a forum for the discussion and resolution of intergovernmental problems, provide high-quality research support to state and local government officials in order to improve the overall quality of government in Tennessee, and to improve the effectiveness of the intergovernmental system in order to better serve the citizens of Tennessee.

<sup>8</sup>Tennessee Advisory Commission on Intergovernmental Relations, *Building Tennessee's Tomorrow: Anticipating the State's Infrastructure Needs* (Nashville, TN: Aug. 30, 2016). The Commission was required by Chapter 817 of the Tennessee Public Acts of 1996 to develop and maintain an inventory of public infrastructure needs in order for the state, municipal, and county governments of Tennessee to develop goals, strategies, and programs that would improve the quality of life of its citizens, support livable communities, and enhance and encourage the overall economic development of the state. The report defines water and wastewater infrastructure as capital facilities or land assets developed or acquired to support the treatment or distribution of potable water, or the collection, treatment, or disposal of commercial and residential sewage or other liquid waste for general public benefit.

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# Appendix III: GAO Contacts and Staff Acknowledgments

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## GAO Contacts:

Anne-Marie Fennell, (202) 512-3841 or [fennella@gao.gov](mailto:fennella@gao.gov) and J. Alfredo Gómez, (202) 512-3841 or [gomezj@gao.gov](mailto:gomezj@gao.gov)

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## Staff Acknowledgments

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