United States General Accounting Office

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Report to the Special Committee on the Year 2000 Technology Problem, U.S. Senate

April 1999

# YEAR 2000 COMPUTING CRISIS

# Status of the Water Industry



GAO/AIMD-99-151

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**United States**
**General Accounting Office**
**Washington, D.C. 20548**

**Accounting Information**
**Management Division**

B-282528

April 21, 1999

The Honorable Robert F. Bennett
Chairman
The Honorable Christopher Dodd
Vice Chairman
Special Committee on the
Year 2000 Technology Problem
United States Senate

A clean supply of drinking water and the removal and treatment of wastewater are critical to the safety and well-being of the public as we move into the next century. At your request, we identified the water utility sector's vulnerability to Year 2000 problems, the reported status of Year 2000 readiness, and activities being undertaken to address this issue. On April 12, 1999, we briefed your office on the results of our work. The briefing slides are included in appendix I.

This report provides a high-level summary of the information presented at that briefing, including background information, Year 2000 risks, actions taken by the President's Council on Year 2000 Conversion, the reported readiness of the drinking water and wastewater industries, actions taken by regulators to oversee water and wastewater facilities' Year 2000 status, and practices used by leading facilities to address their Year 2000 problems. This report also presents suggestions we are making to reduce the risk of Year 2000-related failures of drinking water or wastewater services, and to ensure that the public has adequate information about what is being done to reduce the risk of such failures.

## Results in Brief

Water and wastewater treatment facilities often use automated control systems and equipment to obtain, treat, and distribute drinking water, and to collect, treat, and release wastewater. These control systems and equipment are subject to Year 2000 failures. However, little is known about the Year 2000 status of the nation's water and wastewater facilities. While the President's Year 2000 Conversion Council's water sector working group has undertaken an awareness campaign and is urging national water sector associations to continue to survey their memberships to determine their Year 2000 readiness, to date these associations' surveys have had low response rates. Further, Environmental Protection Agency (EPA) officials stated that the agency currently lacks the rules and regulations necessary to require water and wastewater facilities to report on their Year 2000

status, and that developing such rules and regulations would be a time-consuming process.

We surveyed state regulators to identify their efforts to monitor the Year 2000 status of the water and wastewater facilities they regulate, and found a wide range of responses. A few states were proactively collecting Year 2000 compliance data from the facilities they regulate, while a much larger group of states was disseminating Year 2000 information, and another group was not actively using either approach.[1] Further, only a handful of state regulators believed that under the current regulatory framework, they were responsible for ensuring facilities' Year 2000 compliance, or overseeing facilities' business continuity and contingency plans. As a result, insufficient information is available to assess and manage Year 2000 efforts in the water sector, and little additional information is expected under the current regulatory framework.

## Background

The United States' population is served by about 55,000 community drinking water facilities and by about 16,000 public wastewater facilities.[2] While most of these facilities are relatively small, about 3,300 large and very large drinking water facilities and about 500 large and very large wastewater facilities serve the majority of the population.[3]

In most communities, water flows or is pumped from a raw water source—such as a lake or stream—into a water treatment facility where solids are aggregated and filtered out, and chemicals are added to disinfect the water. Other chemicals may also be added to control minerals or corrosion. Drinking water is then typically pumped into a storage tank or reservoir, and distributed via gravity or pumping stations through water mains to homes and businesses. Wastewater is subsequently collected from homes and businesses through sewer lines and often pumped via pumping stations

[1]The state Public Utility Commissions we surveyed were more proactive, but they typically oversee a minority of the facilities in each state.

[2]This excludes people who receive their water from individually-owned and operated sources, including wells and springs. It also excludes those whose wastewater is treated by on-site septic systems or privately-owned wastewater facilities.

[3]According to EPA, large drinking water facilities serve between 10,001 and 100,000 people and very large facilities serve over 100,000 people. A major wastewater association categorizes wastewater treatment facilities by the flow of wastewater treated per day, with large facilities generally treating between 10 million and 100 million gallons per day and the very large facilities treating more than 100 million gallons per day.

to a wastewater treatment facility. At this facility, solids are allowed to settle out or are filtered out, and chemicals are added to disinfect the effluent before it is released—often to a river, stream, or lake. Treated effluent from wastewater facilities is often taken in by drinking water facilities downstream.

## The Water Sector is Vulnerable to Year 2000 Failures

Many water facilities rely on information technology and digital controls with embedded microprocessors to process and distribute drinking water, and to collect and treat wastewater.[4] In large and medium facilities, Supervisory Control and Data Acquisition (SCADA) systems are often used to monitor and control equipment. Programmable logic controllers (PLC) communicate with the SCADA systems and with electronic controls in equipment such as pumps, valves, and sensors. Even smaller facilities that perform many functions manually will often use some level of automation to control their water and wastewater treatment processes.

Year 2000-induced failures in SCADA systems, PLCs, or electronic controls could affect a facility's ability to monitor and control its operations, resulting in loss of pressure in a drinking water system; under- or overtreated drinking water; or overflow of untreated sewage into public waterways. Additionally, although many facilities have manual backup procedures in place, failures of multiple systems may overtax staff resources—even if each failure is manageable in itself.

In addition to Year 2000 risks posed by internal systems, water and wastewater facilities are heavily dependent on external entities, including the power and telecommunications infrastructure and chemical suppliers. An official at a large water facility told us that without power, the facility would shut down. He noted that even minor fluctuations in power supply affect the facility's operations by causing pumps to shut down.

[4]A facility's level of automation can range from highly automated process controls to mostly manual operations, with medium and large facilities more likely to be highly automated than smaller facilities.

## The President's Council on Year 2000 Conversion Has Been Active in the Water Sector, But Little is Known About Most Water Facilities' Year 2000 Readiness

The President's Council on Year 2000 Conversion established a water sector working group, led by EPA. This working group has undertaken a number of activities, including an awareness campaign aimed at disseminating information on the Year 2000 problem to water and wastewater facilities. It has also urged water sector trade associations to continue surveying their memberships as to the water and wastewater facilities' Year 2000 readiness.

To date, associations' surveys have had low response rates and, as a result, little is known about the status of the nation's water and wastewater facilities. Specifically, three national drinking water associations sent a voluntary survey to about 4,000 water facility operators through August 1998. Survey responses showed that 51 percent of respondents had completed an internal assessment of their Year 2000 risks, and 81 percent expected to complete their internal Year 2000 work in time. However, there was only an 18-percent response rate overall, and these responses accounted for less than 1 percent of the nation's very small to medium facilities; about 8 percent of the nation's large facilities; and about 25 percent of the very large facilities.

Additionally, a national wastewater association surveyed its membership of mostly large public wastewater facilities in June and again in October 1998. The latest survey results indicated that by the end of April 1999, only 35 percent of respondents expected to complete Year 2000 repairs, 24 percent expected to complete Year 2000 testing, and 18 percent expected to complete implementation of system repairs. However, the survey response rate was low—falling from a 37-percent response rate in June to a 21-percent response rate in October. Further, because the membership consisted of mostly large facilities, few small and medium facilities participated in this survey. Responses to the latest survey account for less than 1 percent of the nation's very small to medium public facilities, 7 percent of the nation's large public facilities, and 15 percent of the nation's very large public facilities.

Because the water associations have not had a high response rate, other organizations may need to fill in the gaps in information. EPA officials stated, however, that without developing regulations and information collection rules—which would likely be a very time-consuming process—they lack the means to require facilities to report on their Year 2000 status. As a result, little is known on a national level regarding water facilities' Year 2000 readiness.

## Regulators' Year 2000 Activities Vary, Resulting in Insufficient Information About the Year 2000 Readiness of the Water Sector

The Safe Drinking Water Act (SDWA) and the Clean Water Act (CWA) provide EPA regulatory authority for drinking water and wastewater quality. EPA has delegated responsibility to most states for basic regulatory functions such as enforcing drinking water standards, and issuing and enforcing permits that allow wastewater facilities to discharge treated wastewater. EPA monitors and collects compliance information from the states.

In addition to the responsibilities provided under the SDWA and CWA, many states have legislation providing Public Utility Commissions (PUCs) other regulatory responsibilities, including rate-setting, handling of consumer complaints, inspections, and audits of private water and wastewater facilities.[5] Most state PUCs regulate facilities that serve a small portion of the population. Only a few affect a broader population. Specifically, five states' PUCs responsible for drinking water and two states' PUCs responsible for wastewater regulate facilities that serve over half of those states' population.[6]

We surveyed state administrations and PUCs to identify their efforts to monitor the Year 2000 status of the water and wastewater facilities they regulate and found a wide range of initiatives. A few state administrations were proactively collecting readiness information from the facilities they regulated; a much larger group was disseminating Year 2000 information; and another large group was inactive on the Year 2000 issue. In general, the PUCs were more proactive, but again, most PUCs affect only a small portion of the state population. Appendix I provides further details on each state's survey responses.

In other survey results, only a few state administrations reported that, under the current regulatory framework, they were responsible for ensuring facilities' Year 2000 compliance or overseeing facilities' business continuity and contingency plans. EPA officials agreed that current regulations do not require states to take responsibility for the Year 2000 issue.

[5]About 20 states also provide PUCs the authority to regulate some public facilities.

[6]The five states with PUCs that regulate drinking water facilities serving over half the population are Connecticut, Indiana, Rhode Island, West Virginia, and Wisconsin. The two states with PUCs that regulate wastewater facilities serving over half the population are Rhode Island and West Virginia.

Because of the large number of state regulators that are not collecting facilities' readiness information, there is insufficient information to assess and manage Year 2000 efforts in the water sector. Further, little additional information is expected under the current regulatory framework.

## Leading Facilities Use Common Practices To Address Year 2000

To gain insight into the practices used at water sector facilities that were identified as having made progress in their Year 2000 efforts, we visited small, medium, and large water and wastewater facilities. We found that these leading organizations had practices that were consistent with our published guidance for addressing the Year 2000 issue.[7]

Leading facilities' practices included (1) gaining executive management support, (2) conducting enterprise-wide inventories of information systems and components, (3) prioritizing systems and components to be converted or replaced, (4) identifying, prioritizing, and mobilizing needed resources, (5) replacing noncompliant systems and hardware, (6) testing converted and replaced systems and components, and (7) developing contingency plans for mission-critical systems. A few facilities had also developed innovative practices—such as bar-coding every inventory item to facilitate tracking its Year 2000 progress and requiring operators to practice running facilities without electronic controls.

## Suggested Actions

In order to reduce the risk of Year 2000-related failures of drinking water and wastewater services and to ensure that the public has adequate information about what is being done to reduce the risk of such failures, we suggest that:

- The President's Council on Year 2000 Conversion consider requesting that the water sector associations publicly disclose the status of those facilities that have responded to surveys, and identify those that have not responded. In doing so, the Council may want to consider developing a template for collecting and disclosing Year 2000 status information.
- If the current approach of using associations to voluntarily collect information does not yield the necessary information on water facilities'

[7] Year 2000 Computing Crisis: An Assessment Guide (GAO/AIMD-10.1.14, September 1997); Year 2000 Computing Crisis: Business Continuity and Contingency Planning (GAO/AIMD-10.1.19, August 1998); and Year 2000 Computing Crisis: A Testing Guide (GAO/AIMD-10.1.21, November 1998).

Year 2000 readiness by June 1999, the Council consider whether legislative remedies, such as requiring facilities to disclose their Year 2000 readiness data by September 1999, are feasible and should be proposed.
- The Council, EPA, and the states determine which regulatory organization should take responsibility for assessing and publicly disclosing the status and outlook of water sector facilities' Year 2000 business continuity and contingency plans.

EPA officials generally agreed with our suggested actions. However, they noted that associations may be unwilling to disclose facilities' Year 2000 status and state which facilities have not responded to surveys. One official also stated that additional legislation may be needed if EPA is to take responsibility for overseeing facilities' Year 2000 business continuity and contingency plans.

## Objectives, Scope, and Methodology

As requested, our objectives were to determine what Year 2000 issues could affect our nation's water sector and what the President's Council on Year 2000 Conversion, leading facilities, and state regulatory offices are doing to address Year 2000 issues associated with community water and wastewater services.

To identify what Year 2000 issues could affect the water and wastewater industries, we contacted trade associations and engineers and utilized government, private-sector, and trade association Internet sites. We also visited selected water and wastewater facilities to obtain information about the extent of system vulnerabilities.

To identify the Council's activities to address Year 2000 issues associated with water and wastewater industries, we met with officials and attended water sector meetings at EPA. To identify what leading facilities are doing to address the Year 2000 problem, we visited leading water sector organizations and identified practices they thought helped them make progress in addressing the Year 2000 problem. Lastly, to identify what state regulatory offices are doing to address the Year 2000 issues associated with community water and wastewater services, we surveyed state water sector regulators in January and February 1999. To do so, we developed a questionnaire, pretested it at three state locations, and administered it by telephone and fax. We validated our results by obtaining documentation to support interviewees' responses.

We conducted our work at the Environmental Protection Agency in Washington, D.C., and at selected water and wastewater treatment facilities throughout the country. We performed our work from November 1998 through April 1999, in accordance with generally accepted government auditing standards.

We provided a copy of our briefing materials, which were used in preparing this report, to Environmental Protection Agency officials representing the water sector working group of the President's Council on Year 2000 Conversion. The Deputy Assistant Administrator, the Senior Information Resources Management Official of the Office of Water, the Special Assistant to the Director for Ground Water and Drinking Water, and two Special Assistants to the Office of Wastewater Management provided oral comments on the briefing. We have incorporated these comments as appropriate throughout this report.

We are sending copies of this report to the Honorable John Koskinen, Chairman of the President's Council on Year 2000 Conversion; the Honorable Carol M. Browner, Administrator of the Environmental Protection Agency; the Honorable Jacob J. Lew, Director of the Office of Management and Budget; and other interested parties. Copies will be made available to others upon request.

If you have any questions on matters discussed in this letter, please call me at (202) 512-6408, or Colleen Phillips, Assistant Director, at (202) 512-6326. We can also be reached by e-mail at *willemssenj.aimd@gao.gov* and *phillipsc.aimd@gao.gov*, respectively. Other major contributors to this report are listed in appendix II.

Joel C. Willemssen
Director, Civil Agencies Information Systems

# Briefing on the Year 2000 Status of the Water Industry

GAO Accounting and Information Management Division

## Y2K Drinking Water and Wastewater

April 12, 1999
Amended April 19, 1999

*Briefing for the Senate Special Committee on the Year 2000 Technology Problem*

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## Briefing Overview

- Objectives and Methodology
- Background: Sector Decomposition and Demographics
- Year 2000 Risks in the Water Sector
- President's Council on Year 2000 Conversion Actions and Reported Sector Status
- GAO Survey: State Regulators' Actions
- Leading Facilities' Practices
- Observations
- Suggested Actions

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## Objectives

Determine:

- What Year 2000 issues could affect water and wastewater industries
- What the President's Council on Year 2000 Conversion is doing to address Year 2000 issues associated with water and wastewater industries
- What state regulatory offices are doing to address the Year 2000 issues associated with community water and wastewater services
- What leading facilities are doing to address the Year 2000 problem

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# Overview of Methodology

To address these objectives, we:

- contacted trade associations and engineers and utilized government, private sector, and trade association Internet sites for pertinent water industry and Year 2000 information
- attended the President's Council on Year 2000 Conversion water utilities sector meetings at the Environmental Protection Agency to learn about the Council's actions and plans
- surveyed Year 2000 actions of state water sector regulators by developing a questionnaire, pretesting it at three state locations, and administering the questionnaire by telephone and fax
- visited leading water sector facilities to learn about best practices in addressing the Year 2000 problem

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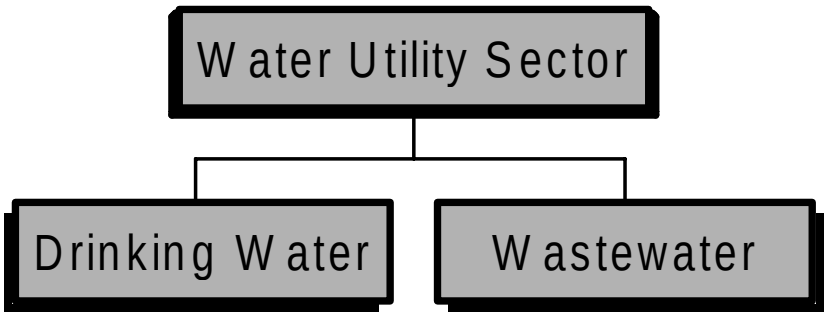
# Background: Decomposition of Water Sector




- Public and Private Water Facilities
  - Large
  - Medium
  - Small
- Federal Facilities
  - DOD
  - Others

- Public and Private Wastewater Treatment Facilities
  - Large
  - Medium
  - Small
- Federal Facilities
  - DOD
  - Others

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# Background: Water Sector Demographics

- Approximately 55,000 community drinking water facilities serve about 94% of the U.S. population.
  - The remainder of the population receive their water from individually owned and operated sources including wells, cisterns, and springs.
- About 16,000 public wastewater facilities collect and process over 32 billion gallons of wastewater per day from about 187 million people (about 70% of the U.S. population).
  - The remainder of the U.S. population's wastewater is treated by on-site septic systems or privately-owned wastewater facilities.

Source: Environmental Protection Agency

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# Background: Water Sector Demographics (cont'd.)

The nation's water and wastewater treatment facilities are diverse:

- Publicly-Owned:
  - generally owned and operated by local governments--counties and municipalities or by water or sanitation districts.
  - serve a majority of the population.
- Privately-Owned:
  - generally owned and operated for profit.
  - serve a minority of the population.

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# Background: Water Sector Demographics (cont'd.)

EPA categorizes drinking water facilities according to the number of people they serve:

| Size | Population served | Number of facilities |
|---|---|---|
| Very Small | 25-500 | about 32,000 |
| Small | 501-3,300 | about 14,000 |
| Medium | 3,301-10,000 | about 4,000 |
| Large | 10,001-100,000 | about 3,000 |
| Very Large | Over 100,000 | about 330 |

About 75 percent of the population is served by large or very large water facilities.

Levels of automation range from manual operations to highly automated process control systems--medium and large facilities tend to be more automated.

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# Background: Water Sector Demographics (cont'd.)

The Association of Metropolitan Sewerage Agencies (AMSA) categorizes wastewater facilities according to the flow of wastewater treated. These facilities range from very small to very large.

- About 13,000 public wastewater facilities treat less than 1 million gallons per day.
- 47 public wastewater facilities treat more than 100 million gallons per day.

As with drinking water, levels of automation range from manual operations to highly automated process control systems--medium and large facilities tend to be more automated.

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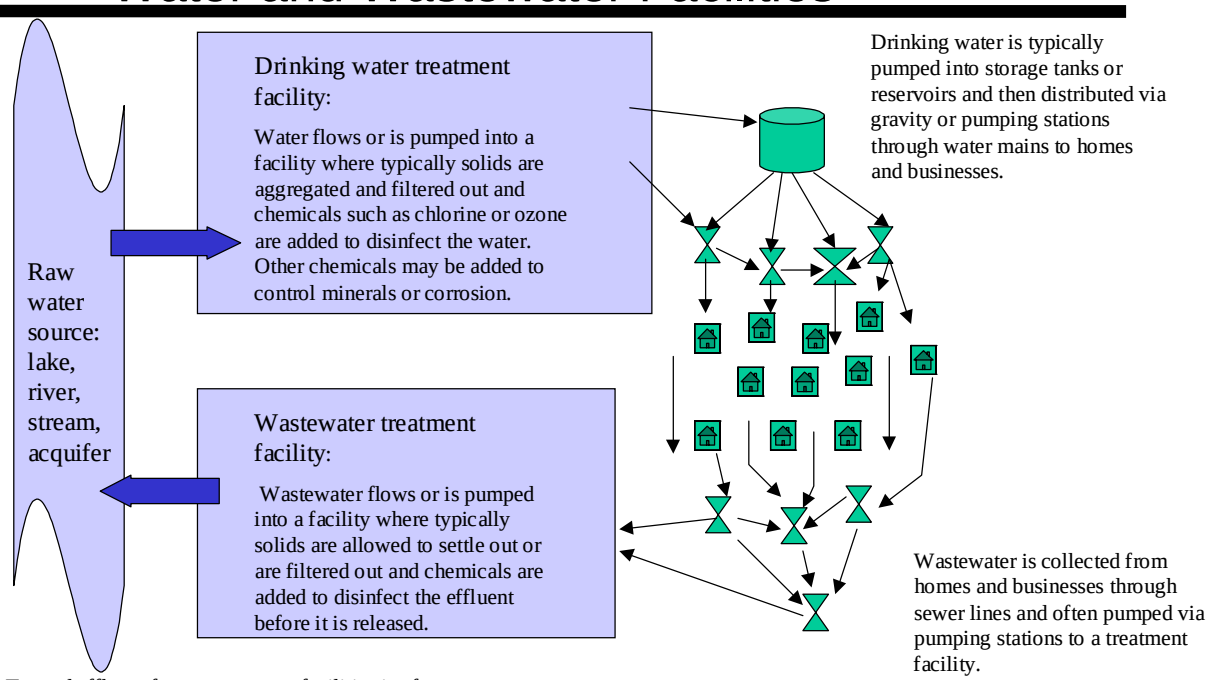
# Background: General Schematic of Drinking Water and Wastewater Facilities

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# Year 2000 Risks in the Water Sector

Many water facilities rely on information technology and digital controls with embedded microprocessors to process and distribute drinking water and to collect and treat wastewater.

Potential Year 2000 failure modes and consequences include:

- Supervisory Control and Data Acquisition (SCADA) systems--which enable plant operators to monitor and control equipment throughout a large treatment plant--may fail, making it difficult to monitor facility operations.
- Digital controls for pumps may fail, resulting in lack of pressure in drinking water systems or overflow of untreated sewage.
- Digital controls or sensors for chemical metering systems may fail, resulting in under-treated or over-treated drinking water; or discharge of untreated sewage, which may render public waters unusable or unsafe.
- Although many facilities have manual backup procedures, failures of multiple systems in a facility may overtax staff resources--even if each failure is manageable by itself.

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## GAO Year 2000 Risks in the Water Sector: Supervisory Control and Data Acquisition

A central Supervisory Control and Data Acquisition (SCADA) console, from which a plant operator can monitor and control equipment throughout a large treatment plant.

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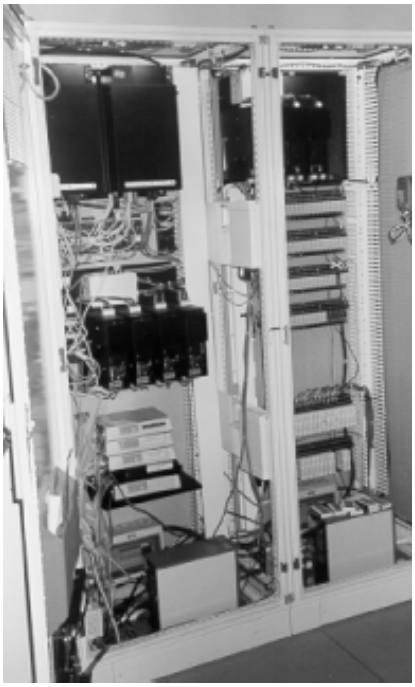
## Year 2000 Risks in the Water Sector: Programmable Logic Controller

An equipment cabinet with programmable logic controllers that communicate with electronic controls for individual pieces of equipment such as pumps, valves, and sensors, and with the central SCADA system.



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# Year 2000 Risks in the Water Sector

Even if a water facility does not use computers or equipment with digital controllers, it can be affected by others that do, such as

- electric power companies,
- telecommunications companies, and
- chemical suppliers.

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## GAO Actions of the President's Council on Year 2000 Conversion Water Utility Sector

The President's Council on Year 2000 Conversion designated EPA as the lead for the water utility sector. To date, EPA has

- disseminated information on the Year 2000 problem;
- encouraged sector trade associations to survey their membership and to conduct follow-up surveys;
- issued policy to encourage Year 2000 testing by stating its intent to waive civil penalties, and to recommend against criminal prosecution, for environmental violations caused by Year 2000 testing--subject to certain conditions, including the need to correct any testing-related violations immediately; and
- asked its regional offices to encourage states that are not currently doing so to take action to address the Year 2000 problem in water facilities.

However, EPA officials say the agency lacks the means to require facilities to report on their Year 2000 status without the time-consuming development of regulations and rules.

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## GAO President's Council on Year 2000 Conversion Water Utility Sector: Reported Preparedness of Drinking Water Facilities

Three key drinking water associations, including the American Water Works Association (AWWA), sent a voluntary survey to about 4,000 facility operators through August 1998.

- 725 operators responded by December 1998. About half reported they had completed their Year 2000 assessments of internal systems.
- AWWA cautions that the responses may be biased in favor of facilities that are better prepared for the Year 2000.
- Survey responses account for less than 1 percent of the nation's very small to medium facilities; about 8 percent of the nation's large facilities, and about 25 percent of the very large facilities.
- AWWA plans to conduct a follow-up survey and report updated findings by July 1999.

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## GAO President's Council on Year 2000 Conversion Water Utility Sector: Reported Preparedness of Wastewater Facilities

In June 1998, the Association of Metropolitan Sewerage Agencies (AMSA) surveyed its membership of 206 mostly large municipal facilities. AMSA reported

- 37 percent responded, and
- of these, 95 percent had begun to implement solutions for the Year 2000 problem.

In October 1998, AMSA conducted another survey focusing on when facilities expected to complete major conversion steps. AMSA reported

- 21 percent responded, and
- the respondents project that by April 1999;
  - 35% would be complete with repair
  - 24% would be complete with testing
  - 18% would be complete with implementation.

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## GAO President's Council on Year 2000 Conversion Water Utility Sector: Reported Preparedness of Wastewater Facilities (cont'd.)

- Survey responses account for less than 1 percent of the nation's very small to medium public facilities; about 7 percent of the nation's large public facilities, and about 15 percent of the very large public facilities.
- The wastewater association plans to conduct a follow-up survey and report updated findings by July 1999.

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# GAO Survey: Overview of Regulatory Framework

| | Regulation of Drinking Water Contaminants and Discharge of Wastewater Effluents | Other Regulatory Responsibility *(could include rate-setting, handling consumer complaints, inspections, and audits)* |
|---|---|---|
| **Regulators** | | |
| **US Environmental Protection Agency (EPA)** | The Safe Drinking Water (SDWA) and Clean Water Act (CWA) provide EPA certain regulatory responsibilities for water quality. EPA has delegated authority to most state administrations for basic regulatory functions such as enforcing drinking water standards and issuing and enforcing permits that allow facilities to discharge treated wastewater. EPA monitors and collects compliance information from states. | |
| **State administrations** | Unless EPA retained authority under SDWA and CWA or this authority was further delegated to local administrations, state administrations are responsible for regulatory functions such as enforcing drinking water standards under SDWA and issuing and enforcing permits under CWA. Some state legislation provides additional authority. States report federal compliance information back to EPA, and can lose their regulatory authority if the facilities do not meet regulatory standards. | |
| **Public utility commissions (PUCs)** | | State legislation often provides authority to PUCs to regulate private water and wastewater facilities. Nineteen states also provide PUCs the authority to regulate some public facilities. PUCs typically oversee a minority of the facilities in each state. |
| **Local administrations** | States may delegate authority to regulate specific components of SDWA and CWA to local administrations. Some local administrations also have local legislation that provides them with authority to regulate additional health requirements. | State and local legislation provide local administrations with authority to regulate public water and wastewater facilities. |

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**The shaded area indicates the regulators we surveyed**

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# GAO Survey: Scope

- Conducted January through February 1999
- Interviewed the primary drinking water, wastewater, and public utility commission contact in each state
- Interviews were conducted via telephone or faxed questionnaire and validated by documentation supporting interviewees' responses
- Respondent rates:
  - 50 drinking water administrations 100%
  - 50 wastewater administrations 100%
  - 50 public utility commissions--drinking water 88%
  - 50 public utility commissions--wastewater 88%

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# GAO Survey: Analysis Approach

We placed each state regulator into one of three categories:*

- **Proactive**--these regulators reported taking action to assess the readiness of water or wastewater facilities. Most proactive states also reported taking action to provide (1) information about the Year 2000 problem, or (2) guidance about how to address the Year 2000 problem to facility operators in their states.
- **Active**--these regulators reported taking action to disseminate general information about potential Year 2000 problems or notify operators about their responsibilities to ensure that their facilities remain in compliance with applicable regulations after 1/1/2000, but did not assess the Year 2000 progress of facilities in their states.
- **Inactive**--these regulators reported not taking action to provide information about potential Year 2000 problems to facility operators, or to assess the readiness of water sector facilities in their states.

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*Note: One should not draw conclusions about the state of individual water facilities on the basis of a regulator's level of activity. A regulator's activity level is one of many factors that may affect facilities' progress.

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# GAO Survey: Summary of Results

| Status | Drinking water administration | Public water commission (drinking water) | Water pollution control administration (wastewater) | Public utility commission (wastewater) |
|---|---|---|---|---|
| **Proactive—** Reported taking action to assess readiness of water facilities | 2 | 34 | 3 | 21 |
| **Active—** Reported taking action to disseminate information about the problem | 28 | 1 | 30 | 2 |
| **Inactive—** Reported taking no action | 20 | 3 | 17 | 0 |
| **Reported lack of regulatory authority** | | 6 | | 21 |
| **Did not respond to questionnaire** | | 6 | | 6 |

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# GAO Survey: Drinking Water Administrations

Summary of actions by state drinking water administrations on the Year 2000 problem

| Condition | States | Description |
|---|---|---|
| **Proactive** **(2)** | Colorado, Minnesota | These states reported taking action to assess readiness of drinking water facilities. Most of these states also reported taking action to provide (1) information about Year 2000, or (2) guidance about how to address Year 2000 to operators in their states. |
| **Active** **(28)** | Arkansas, California, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Maryland, Massachusetts, Missouri, New Hampshire, New York, North Dakota, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, West Virginia, Wyoming[1] | These states reported taking action to disseminate information about the problem or notify operators about their responsibility for Year 2000, but did not assess the Year 2000 progress of facilities in their states. |
| **Inactive** **(20)** | Alabama, Alaska, Arizona, Connecticut, Delaware, Kansas, Kentucky, Louisiana, Maine, Michigan, Mississippi, Montana, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon | These states reported not taking action to provide information about potential Year 2000 problems to facility operators, or to assess the readiness of drinking water facilities in their states. Some of these states said they plan to take action in the future. |

[1] The US Environmental Protection Agency has regulatory authority in Wyoming under the Safe Drinking Water Act.



Note: Facilities may have received Year 2000 information from other sources, including EPA, trade associations, and other state organizations.

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# GAO Survey: Public Utility Commissions that Regulate Drinking Water

Summary of actions by state public utility commissions responsible for regulating drinking water facilities on the Year 2000 problem[1]

| Condition | States | Description |
|---|---|---|
| **Proactive (34)** | Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut[2], Delaware, Idaho, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Jersey, New York[3], North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Utah, Vermont, West Virginia, Wisconsin, Wyoming | These states reported taking action to assess the Year 2000 status of drinking water facilities. Most of these states also reported taking action to provide (1) information about Year 2000, or (2) guidance about how to address Year 2000 to operators in their states. |
| **Active (1)** | Florida | This state reported taking action to disseminate information about the problem or notify operators about their responsibility for Year 2000, but did not assess the Year 2000 progress of facilities in the state. |
| **Inactive (3)** | Kansas, Nebraska, Washington | These states reported not taking action to provide information about potential Year 2000 problems to facility operators, or to assess the readiness of drinking water facilities in their states. Some of these states said they plan to take action in the future. |
| **Non-Regulating (6)** | Georgia, Michigan, Minnesota, North Dakota, South Dakota, Texas | These state public utility commissions reported they are not responsible for regulating private drinking water facilities. |
| **Non-Responding (6)** | Hawaii, Louisiana, Massachusetts, New Mexico, Pennsylvania, Virginia | These states did not respond to the questionnaire. |

[1] In most states, the PUC regulates facilities that serve a relatively small percentage of the population. However, in five states--Connecticut, Indiana, Rhode Island, West Virginia, and Wisconsin—the PUC regulates facilities that serve over half of the population.
[2] Connecticut reported it has collected Year 2000 information from only the 3 largest investor owned water facilities in the state. They said they are only secondarily tracking the status of the other medium and smaller size water facilities they regulate.
[3] New York reported that they are actively monitoring Year 2000 compliance for the 6 largest regulated facilities serving about 80% of the regulated population. They reported that the remaining 374 companies, 20% of the population, are monitored on a less rigorous basis.



Note: Facilities may have received Year 2000 information from other sources, including EPA, trade associations, and other state organizations.

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# GAO Survey: Wastewater Administrations

Summary of actions by state water pollution control (wastewater) administrations on the Year 2000 problem

| Condition | States | Description |
|---|---|---|
| **Proactive** **(3)** | Alaska, California, Utah | These states reported taking action to assess readiness of wastewater facilities. Most of these states have also reported taking action to provide (1) information about Y2K, or (2) guidance about how to address Y2K to operators in their states. |
| **Active** **(30)** | Alabama, Colorado, Delaware, Florida, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Vermont, Wisconsin, Wyoming | These states reported taking action to disseminate information about the problem or notify operators about their responsibility for Y2K, but did not assess the Year 2000 progress of facilities in their states. |
| **Inactive** **(17)** | Arkansas, Arizona, Connecticut, Georgia, Indiana, Louisiana, Maryland, Mississippi, Montana, New Mexico, North Dakota, Ohio, Tennessee, Texas, Virginia, Washington, West Virginia | These states reported not taking action to provide information about potential Y2K problems to facility operators, or to assess the readiness of water pollution control facilities in their states. Some of these states said they plan to take action in the future. |

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Note: Facilities may have received Year 2000 information from other sources, including EPA, trade associations, and other state organizations.

# GAO Survey: Public Utility Commissions that Regulate Wastewater

Summary of actions by state public utility commissions responsible for regulating wastewater facilities on the Year 2000 problem[1]

| Condition | States | Description |
|---|---|---|
| **Proactive (21)** | Alaska, Arizona, Arkansas, Illinois, Indiana, Kentucky, Maryland, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Jersey, North Carolina, Ohio, Rhode Island, South Carolina, Tennessee, Utah, West Virginia, Wisconsin | These states reported taking action to assess the Year 2000 status of wastewater facilities. Most of these states also reported taking action to provide (1) information about Year 2000, or (2) guidance about how to address Year 2000 to operators in their states. |
| **Active (2)** | California, Florida | These states reported taking action to disseminate information about the problem or notify operators about their responsibility for Year 2000. |
| **Inactive (0)** | | These states reported taking action to date to provide information about potential Year 2000 problems to facility operators, or to assess the readiness of wastewater facilities in their states. Some of these states said they plan to take action in the future. |
| **Non-Regulating (21)** | Alabama, Colorado, Connecticut, Delaware, Georgia, Idaho, Iowa, Kansas, Maine, Michigan, Minnesota, Nebraska, New York, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Vermont[2], Washington, Wyoming | These state public utility commissions reported they are not responsible for regulating private wastewater facilities. |
| **Non-Responding (6)** | Hawaii, Louisiana, Massachusetts, New Mexico, Pennsylvania, Virginia | These states did not respond to the questionnaire. |

[1] In most states, the PUC regulates facilities that serve a relatively small percentage of the population. However, in two states--Rhode Island and West Virginia—the PUC regulates facilities that serve over half the population.
[2] Vermont reported it has regulatory authority for wastewater facilities; however, they reported regulating none at this time.



Note: Facilities may have received Year 2000 information from other sources, including EPA, trade associations, and other state organizations.

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# GAO Survey: Many People Are Served by Facilities with Inactive Regulators

| Populations served by: | Drinking water population served (millions) | Wastewater population served (millions) |
|---|---|---|
| Facilities with proactive regulators | 36 | 32 |
| Facilities with active regulators | 151 | 98 |
| Facilities with inactive regulators | 58 | 56 |
| Totals | 245 | 186 |

- Note: Facilities may have received Year 2000 information from other sources, including EPA, trade associations, and other state organizations.

Source: GAO analysis based on EPA and PUC population data

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# GAO Survey: Other Results

Relatively few state regulators said they were responsible for ensuring the Year 2000 compliance of water facilities:

- only 4 of 100 drinking water and wastewater administrations reported being responsible for ensuring Year 2000 compliance
- less than half of the public utility commissions (PUCs) that reported regulating water sector facilities said that they were responsible for ensuring Year 2000 compliance
    - some of these PUCs said they could not guarantee the Year 2000 compliance of water sector facilities they regulate

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# GAO Survey: Other Results (cont'd.)

Relatively few state regulators said that they oversee Year 2000 business continuity and contingency plans (BCCPs) that will be used by water facilities in the event of a Year 2000 emergency:

- 3 drinking water administrations and 1 wastewater administration reported they would oversee or review facilities' Year 2000 BCCPs
- 1 wastewater administration reported that it has an advisory role and expects facilities' BCCPs to be available for inspection
- 14 PUCs that regulate drinking water and 7 PUCs that regulate wastewater facilities said they would oversee or review BCCPs

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# Year 2000 Practices at Leading Facilities

We observed a number of practices at leading facilities that are consistent with GAO Guidance:*

- Obtaining executive management support
- Conducting an enterprise-wide inventory of information systems and their components
- Prioritizing systems and components to be converted or replaced
- Identifying, prioritizing, and mobilizing needed resources
- Replacing noncompliant systems and hardware
- Testing converted and replaced systems and components
- Developing contingency plans for mission-critical systems

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* Year 2000 Computing Crisis: An Assessment Guide (GAO/AIMD-10.1.14, September 1997)
Year 2000 Computing Crisis: Business Continuity and Contingency Planning (GAO/AIMD-10.1.19, August 1998)
Year 2000 Computing Crisis: A Testing Guide (GAO/AIMD-10.1.21, November 1998)

## GAO Year 2000 Practices at Leading Facilities (cont'd.)

Innovative practices observed:

- identifying and bar coding every piece of electronic equipment to track Year 2000 status and ensure that all equipment is checked for Year 2000 compliance
- scheduling every operator to practice running the facility without electronic controls

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# Observations

Insufficient information is available to assess and manage water facilities' Year 2000 efforts.

- Few states have surveyed the Year 2000 status of water sector facilities
- Existing national surveys have low response rates
- Information about the status of small and medium facilities is limited

Little additional information is likely to emerge under the current regulatory framework.

- Few additional states plan to survey facilities' Year 2000 status
- State regulators responsible for water facilities' compliance under the Clean Water Act and the Safe Drinking Water Act generally report they lack specific responsibility for Year 2000 compliance of water facilities' equipment
- EPA officials say the agency lacks the means to conduct mandatory collection of data on facilities' Year 2000 status

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# Suggested Actions

In order to reduce the risk of Year 2000-related failures of drinking water or wastewater services and ensure that the public has adequate information about what is being done to reduce the risk of such failures, we suggest that

- the President's Council consider requesting that the water sector associations publicly disclose the status of those facilities that have responded to surveys, and identify those that have not responded;
    - in doing so, the Council may want to consider developing a template for collecting and disclosing Year 2000 status information;
- if the current approach of using associations to voluntarily collect information does not yield the necessary information on water facilities' Year 2000 readiness by June 1999, the Council may wish to consider whether legislative remedies, such as requiring facilities to disclose their Year 2000 readiness data by September 1999, are feasible and should be proposed; and

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# Suggested Actions (cont'd.)

- the Council, EPA, and the states should determine which regulatory organization should take responsibility for assessing and publicly disclosing the status and outlook of water sector facilities' Year 2000 business continuity and contingency plans.

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# Major Contributors to This Report

## Accounting and Information Management Division, Washington, D.C.

Robert C. Reining, Evaluator in Charge
Sharon O. Byrd, Senior Auditor
Christina M. Bower, Evaluator

## Atlanta Field Office

Glenda C. Wright, Senior Information Systems Analyst

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