How good is the database that the U.S. Environmental Protection Agency (EPA) uses to track the nation’s drinking water quality? EPA’s own Office of the Inspector General (OIG) raised that issue recently in a 20-page memo questioning the accuracy of the data.

The March 2004 OIG memo, EPA Claims to Meet Drinking Water Goals Despite Persistent Data Quality Shortcomings, states that EPA incorrectly reported meeting its drinking water goal under the Government Performance and Results Act (GPRA) from 1999 to 2002.

“In each of those years, EPA reported that it met its annual goal of 91 percent of the population drinking water that met health-based standards,” OIG’s memo states. “However, EPA’s own analysis, supported by our review, indicated the correct number was unknown but less than what was reported.”

Despite questions of data quality shortcomings, Ben Grumbles, EPA acting assistant administrator, says the data is accurate, but incomplete.

“The data is improving, but it’s still inadequate,” says Grumbles. “We have an aggressive plan to improve it. We are putting a priority on working with state partners to improve the completeness of the data and plan to follow up on that.”

Grumbles stresses that the incomplete data in no way implies unsafe drinking water conditions exist in the U.S. The OIG report agrees, noting that “this inaccuracy in reporting does not necessarily indicate a direct or immediate threat to human health.”

Safe Water Is the Goal

Under the GPRA, federal agencies are required to present an annual progress report to Congress about achieving specific goals. EPA’s overall goal is that 95 percent of the population that community water systems serve will receive water that meets all health-based drinking water standards by 2008.

Under the Safe Drinking Water Act (SDWA), EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who enact those standards.

Data used to track this drinking water performance goal comes from the Safe Drinking Water Information System/Federal Version (SDWIS/FED), a computer-based program that stores tracking information about program management of 84 contaminants for more than 160,000 public water systems (PWS) in 56 state and territorial programs and on tribal lands.

States provide this data to EPA, including limited descriptions of water system information, violations of regulatory standards, and information on state enforcement actions. EPA regulations establish maximum contaminant levels, treatment techniques, and monitoring and reporting requirements to ensure that water is safe for drinking.
OIG Findings

The OIG report states that the review of SDWIS/FED was initiated to determine two things:
1. How do incomplete or inaccurate drinking water data affect the drinking water GPRA calculation?
2. What actions has EPA undertaken to ensure that the data are reliable and valid?

During the preliminary research phase, the OIG report states that it learned the EPA Office of Water was conducting analyses that overlapped their own. “Since we already completed work on our first question but not the second, we are reporting the results on the first and suspending our work on the second,” the OIG report adds.

Despite claims that EPA had met its performance goals from 1999 to 2002, the OIG report states “due to missing data on violations of drinking water standards, the agency did not, in fact, meet its drinking water performance goals for these four years.”

It adds, “EPA officials and reports consistently noted that national drinking water performance goals were being achieved. . . .This was also repeated by the media.”

EPA Outlines Its Findings

EPA issued its investigatory results of SDWIS/FED in its Drinking Water Data Reliability Analysis and Action Plan (2003). The report states that overall, data quality has improved since the first data quality assessment released in 2000, echoing Grumbles earlier statements that the accuracy is good, but the data are incomplete.

Concerning the media reports of the alleged incorrect information, Grumbles said EPA uses the best available data that the states report. In addition, many of EPA’s reports and Web sites related to SDWIS/FED note that EPA is aware of inaccuracies and underreporting of some data in the system. He adds that some of the discrepancy problems are a result of the reporting process itself.

“There are a lot of decisions that the states need to make when they are compiling the data,” says Grumbles. “We have found that they don’t have all the information under the various drinking water rules. That’s one of the key areas for us to work with the states to improve upon, collecting more of the information and putting it into the data system.”

In addition, many states do not meet the 90-day deadline for reporting violations, and a significant number of states still periodically do not report violations of certain rules—particularly radionuclides.

States have indicated that regulatory complexity and competing demands of their programs have affected their operation of PWS programs. “They operate their PWS regulatory programs in the best manner they can, which is now stressed by limited and often reduced resources and, most recently, security requirements,” the EPA report adds.
Simple human error may also be a cause, according to the EPA report. “An analysis of data rejected from SDWIS/FED found that 90 percent of the inventory, violations, and enforcement data error types incurred were for data entry errors,” it states. “If the quality of the data measured and reported to SDWIS-FED is not high, then EPA’s ability to report on program progress is hindered.”

Addressing the Issues

Despite these apparent hurdles, Grumbles says EPA has been trying to address the issues. “When we look back at our triennial national review of the state data systems, we do see an important trend toward improved data quality, which is a combination of accuracy and completeness. But we have a lot of work to continue doing with the states to improve the data systems under the SDWA.”

To continue that effort, EPA has two standing committees to identify, analyze, and evaluate implementation, as well as review data management, and recommend corrective or implementation actions.

“Part of our effort here is to work with states to improve and follow-up on the loading in of data and reporting,” Grumbles says. “On an annual basis, we will be entering into work plans with states. And we will be seeing results immediately in terms of the quality of the data.”

Grumbles adds that EPA is increasing the number of random data verification audits from eight to 12. “I think this shows we’re really taking this seriously and have an aggressive plan in place.”

He also says that the SDWIS database is currently undergoing upgrade. “Our efforts to modernize the SDWIS program add up to approximately $6 million a year, which is very significant. We are putting a lot of money into it and giving it a priority.”

The EPA report adds that modernization of SDWIS should address some of the problems of data submission. “With respect to resolving state compliance determination errors, greater efforts will be focused on defining areas of disagreement in regulation interpretation between EPA and states,” the EPA report states.

“Resolution will be achieved through clarification of regulatory requirements, training and technical assistance, and other state-specific program oversight and support activities. For monitoring and reporting, attention will focus on developing mechanisms by which results can be transmitted electronically from laboratories to public water systems and states.”

Other actions taken by EPA and states include:

- improved data entry processes, tools, and training for regions and states;
- improved and simplified data retrieval and reporting tools;
- improved data verification audit procedures; and
- accelerated ongoing data quality improvement activities, such as electronic reporting between utilities, labs, and states.

“The problem was that no one would show me how to use the database.”

Zane Satterfield
P.E., engineering scientist
Other Voices

In an editorial in the January/February 2004 Water Environment Research magazine, G. Tracy Mehan III, who was EPA assistant administrator for water at the time the piece was written, outlined his opinion on the issue. In the editorial, he asks if it is time to turn our national water-monitoring program in a new direction.

He notes that in the EPA Draft Report on the Environment 2003, the water quality chapter, “which was intended to address the condition of the U.S. waters and watersheds, concluded ‘at this time, there is not sufficient information to provide a national answer to this question with confidence and scientific credibility.’”

Why is that? Mehan says, “According to a recent survey of state water quality agencies conducted by the Association of State and Interstate Water Pollution Control Administrators (Washington, D.C.), states are operating their monitoring programs with about one-half of the resources they need with an annual funding shortfall of approximately $170 million.

“As a result, the condition of the majority of state waters is unknown. And because state water quality standards and assessment methods vary, we find we cannot add up the existing state data to get a clear picture of how well our national programs are working.”

Mehan speculates that we are in this position today because, in the 1970s, the nation focused more on enforcement compliance issues related to pollution discharge while monitoring, rightfully, took a back seat.

Zane Satterfield, P.E., engineering scientist with the National Environmental Services Center, worked with SDWIS when he was employed by the West Virginia Bureau of Public Health.

Satterfield said the problem he encountered with SDWIS was a lack of training for engineers using the system. “The problem was that no one would show me how to use the database,” Satterfield says. “I think that was a fairly common practice at the time.”

Despite that hindrance, Satterfield feels the database is accurate. “There’s always room for improvement,” he says. “I know West Virginia’s database is fairly accurate, but I would say it is not complete. “States need more money for personnel. Some states don’t use engineers to do what we did. The money is just not there.”

In the previously published editorial, Mehan outlined four steps that he thinks need to be taken to improve the overall monitoring system, including:

1. improving and strengthening state monitoring programs,
2. developing and promoting multiple monitoring tools, such as statistically based surveys, predictive monitoring, and remote sensing,
3. improving electronic data systems to manage and share monitoring information and make data more accessible to the public, and
4. building stronger partnerships at the federal, state, and local levels to facilitate the sharing of comparable data and the use of multiple monitoring tools.

The Bottom Line

“We take very seriously the data quality and recognize the need to work with the states to provide more complete data. But, again, it is important to note that this is not a sign of a health-based problem. It’s more a question of accuracy and completeness,” says Grumbles.

He adds that states are compiling violations of the health-based standard in the SDWIS/FED system. “We review all the data, and we are finding that less than one percent of the state determinations are violations of those health-based standards. Stated more simply, the vast majority of state compliant determinations are that systems are complying with health-based standards.

“We want states to properly manage their drinking water programs and to be able to communicate accurately what degree of risk there might be so we can provide the information to the public,” he continues. “Good government demands good data. It is critical, and the public health focus of the drinking water program requires the best data. But this will not be an overnight project. This is a long-term effort.”

For more information, contact Grumbles at (202) 564-5777. The public version of SDWIS/FED may be accessed at www.epa.gov/enviro/html/ to check a particular drinking water supplier’s violations and enforcement history since 1993.

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