Order Code IB10118

Safe Drinking Water Act: Implementation and Issues

Updated March 15, 2005

Mary Tiemann
Resources, Science, and Industry Division

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SUMMARY

Key drinking water issues on the agenda in the 109th Congress include problems caused by specific contaminants, such as the gasoline additive methyl tertiary butyl ether (MTBE), perchlorate, and lead, as well as the related issue of the appropriate federal role in providing financial assistance for water infrastructure projects. Congress last reauthorized the Safe Drinking Water Act (SDWA) in 1996, and although funding authority for most SDWA programs expired in FY2003, broad reauthorization efforts are not expected as EPA, states, and water utilities remain busy implementing the requirements of the 1996 amendments.

The 109th Congress is continuing efforts to address MTBE contamination of public water supplies. S. 606 and the House Energy and Commerce Committee discussion draft energy bill propose to strengthen the leak prevention provisions of the federal underground storage tank regulatory program and authorize funding from the Leaking Underground Storage Tank (LUST) Trust Fund for the cleanup of tank leaks involving MTBE. H.R. 789 would require secondary containment for tanks installed near public water supplies or private wells.

Concerns about perchlorate in drinking water also have returned to the congressional agenda, after the past Congress enacted several provisions on this issue. H.R. 213 has been introduced to require EPA to set a drinking water standard for perchlorate in 2007, and a January 2005 National Academy of Sciences report on the health effects of perchlorate has increased oversight interest in perchlorate regulatory activities at EPA.

Concerns over the security of the nation's drinking water supplies were addressed by the 107th Congress through the Bioterrorism Preparedness Act (P.L. 107-188), which amended SDWA to require community water systems to conduct vulnerability assessments and prepare emergency response plans. Subsequent congressional action has involved oversight and funding of water security assessment and planning efforts and research.

An ongoing SDWA issue involves the growing cost and complexity of drinking water standards and the ability of water systems, especially small, rural systems, to comply with standards. The issue of the cost of drinking water standards, particularly the new arsenic standard, has merged with the larger debate over the federal role in assisting communities with financing drinking water infrastructure — an issue that has become more challenging in a time of tightened budgets. Congress authorized a drinking water state revolving fund (DWSRF) program in 1996 to help communities finance projects needed to meet standards. For FY2005, Congress provided $843 million for the DWSRF program, and the President has requested $850 million for FY2006. Notwithstanding this program, studies show that a large funding gap exists and will grow as SDWA requirements increase and infrastructure ages.

In the past Congress, several bills were offered to increase funding for the DWSRF, provide more technical assistance to small systems, and/or create grant programs for qualified small systems; however, none of the bills was enacted. These issues remain on the agenda in the 109th Congress.

MOST RECENT DEVELOPMENTS

The President's FY2006 budget request includes $850 million for the drinking water state revolving fund (DWSRF) program, $105.1 million for state public water system supervision (PWSS) grants, $11 million for state underground injection control (UIC) grants, $5 million for drinking water state homeland security grants, and $44 million for new water security initiatives. For FY2005 (in P.L. 108-447), the 108th Congress provided $850 million for the DWSRF program ($843 million, after applying a mandatory 0.8% across-the-board reduction to accounts funded in this act). Congress also provided $100.5 million for PWSS grants, $10.8 million for UIC grants, and $5 million for drinking water state homeland security grants, all subject to the mandatory 0.8% reduction. Conferees directed EPA to report, by August 2005, on the impact of the arsenic rule on communities, and to propose compliance alternatives and make recommendations to minimize compliance costs.

BACKGROUND AND ANALYSIS

Introduction

The Safe Drinking Water Act (SDWA), Title XIV of the Public Health Service Act (42 U.S.C. 300f-300j-26), is the key federal law for protecting public water supplies from harmful contaminants. First enacted in 1974 and widely amended in 1986 and 1996, the Act is administered through programs that regulate contaminants in public water supplies, provide funding for infrastructure projects, protect sources of drinking water, and promote the capacity of water systems to comply with SDWA regulations. The 1974 law established the current federal-state arrangement in which states and tribes may be delegated primary enforcement and implementation authority (primacy) for the drinking water program by the Environmental Protection Agency (EPA), which is the federal agency responsible for administering the law. The state-administered Public Water Supply Supervision (PWSS) Program remains the basic program for regulating public water systems, and EPA has delegated primacy for this program to all states, except Wyoming and the District of Columbia (which is defined as a state under SDWA); EPA has responsibility for implementing the PWSS program in these two jurisdictions. (See also CRS Report RL31243, *Safe Drinking Water Act: A Summary of the Act and Its Major Requirements*.)

More than 90% of people in the United States get their drinking water from one of the nearly 53,400 community water systems nationwide. Congress passed the SDWA in 1974, after a nationwide study of community water systems revealed widespread water quality problems and health risks resulting from poor operating procedures, inadequate facilities, and poor management of water supplies in communities of all sizes. Since then, government and private efforts to implement the Act have led to better public water system management and more information about, and greater confidence in, the quality of water provided at the tap.

Significant progress has been made during the 28 years of the federal drinking water program. Some 91 drinking water contaminants are now regulated, and EPA reports that the population served by community water systems that met all health-based standards increased from 83% in 1994 to 91% in 2002. Nonetheless, drinking water safety concerns and

challenges remain. EPA and state enforcement data indicate that public water systems still incur tens of thousands of violations of SDWA requirements each year. These violations primarily involve monitoring and reporting requirements, but also include thousands of violations of standards and treatment techniques. Moreover, monitoring and reporting violations create uncertainty as to whether systems actually met the applicable health-based standards. Concern also exists over the potential health effects of contaminants for which drinking water standards have not been set, such as perchlorate and MTBE.

The 1996 SDWA Amendments

The 104th Congress made numerous changes to the Act with the SDWA Amendments of 1996 (P.L. 104-182), culminating a multi-year effort to amend a law that was widely criticized as having too little flexibility, too many unfunded mandates, and an arduous but unfocused regulatory schedule. Among the key provisions, the 1996 amendments authorized a drinking water state revolving loan fund (DWSRF) program to help public water systems finance projects needed to comply with SDWA rules. The amendments also established a process for selecting contaminants for regulation based on health risk and occurrence, gave EPA some added flexibility to consider costs and benefits in setting most new standards, and established schedules for regulating certain contaminants (such as *Cryptosporidium*, arsenic, and radon). The law added several provisions aimed at building the capacity of water systems (especially small systems) to comply with SDWA regulations, and it imposed many new requirements on the states including programs for source water assessment, operator certification and training, and compliance capacity development. The amendments also required that community water suppliers provide customers with annual "consumer confidence reports" that provide information on contaminants found in the local drinking water. The law authorized appropriations for SDWA programs through FY2003.

Regulated Public Water Systems

Federal drinking water regulations apply to some161,000 privately and publicly owned water systems that provide piped water for human consumption to at least 15 service connections or that regularly serve at least 25 people. (The law does not apply to private, residential wells.) Of these systems, roughly 53,400 are *community water systems* (CWSs) that serve a residential population of nearly 270 million year-round. All federal regulations apply to these systems. (Roughly 15% of community systems are investor-owned.) Nearly 18,700 public water systems are *non-transient, non-community water systems* (NTNCWSs), such as schools or factories, that have their own water supply and serve the same people for more than six months but not year-round. Most drinking water requirements apply to these systems. Another 89,000 systems are *transient non-community water systems* (TNCWSs) (e.g., campgrounds and gas stations) that provide their own water to transitory customers. TNCWSs generally are required to comply only with regulations for contaminants that pose immediate health risks (such as microbial contaminants), with the proviso that systems that use surface water sources must also comply with filtration and disinfection regulations.

Of the 53,363 community water systems, roughly 84% serve 3,300 or fewer people. While large in number, these systems provide water to just 10% of the population served by all community systems. In contrast, 7% of community water systems serve more than 10,000 people, and they provide water to 81% of the population served. Fully 85% (15,900) of non-transient, non-community water systems and 97% (86,400) of transient noncommunity water

systems serve 500 or fewer people. These statistics give some insight into the scope of financial, technological, and managerial challenges many public water systems face in meeting a growing number of complex federal drinking water regulations. **Table 1** provides statistics for community water systems.

Table 1. Size Categories of Community Water Systems

System size (population served)	Number of Community Water Systems	Population Served (millions)	Percent of Community Water Systems	Percent of Population Served
Very small (25-500)	30,417	5.01	57%	2%
Small (501-3,300)	14,394	20.26	27%	7%
Medium (3,301-10,000)	4,686	27.20	9%	10%
Large (10,001-100,000)	3,505	98.71	7%	36%
Very large (>100,000)	361	122.15	1%	45%
Total	53,363	273.33	100%	100%

Adapted from: US Environmental Protection Agency. Factoids: Drinking Water and Ground Water Statistics for 2003. Available at Internet website: [http://www.epa.gov/safewater/data/pdfs/factoids_2003.pdf].

Current Drinking Water Issues

Major drinking water issues involve infrastructure funding needs; the security of water supplies; small system capacity to comply with SDWA; and contamination of drinking water by specific contaminants, including lead and the unregulated contaminants, MTBE and perchlorate. Although appropriations for most SDWA programs were authorized through FY2003, SDWA reauthorization was not on the agenda in the 108th Congress. Rather, various bills were offered to address specific issues, such as infrastructure funding and contamination by lead, MTBE, and perchlorate. As with other EPA-administered statutes having expired funding authority, the programs do not expire as long as Congress continues to appropriate funds for these programs. (For information on water supply issues and legislation, see CRS Issue Brief IB10019, *Western Water Resource Issues*.)

Regulating Drinking Water Contaminants

Standard-Setting. The Safe Drinking Water Act directs EPA to promulgate National Primary Drinking Water Regulations for contaminants that may pose public health risks and that are likely to be present in public water supplies. These regulations generally include numerical standards to limit the amount of a contaminant that may be present in drinking water. Where it is not economically and technically feasible to measure a contaminant at very low concentrations, EPA establishes a treatment technique in lieu of a standard.

To develop a drinking water regulation, EPA must address a variety of technical issues. The agency must (1) determine the occurrence of a contaminant in the environment, and especially in public water systems; (2) evaluate human exposure and risks of adverse health effects to the general population and to sensitive subpopulations; (3) ensure that analytical methods are available for water systems to use in monitoring for a contaminant; (4) evaluate

the availability and costs of treatment techniques that can be used to remove a contaminant; and (5) assess the impacts of a regulation on public water systems, the economy, and public health. Consequently, regulation development typically is a multi-year process. EPA may expedite procedures and issue interim standards to respond to urgent threats to public health.

After reviewing health effects studies, EPA sets a nonenforceable maximum contaminant level goal (MCLG) at a level at which no known or anticipated adverse health effects occur and that allows an adequate margin of safety. EPA also considers the risk to sensitive subpopulations (e.g., children). For carcinogens and microbes, EPA sets the MCLG at zero. Because MCLGs consider only health effects and not analytical detection limits or treatment technologies, they may be set at levels that water systems cannot meet. Once the MCLG is established, EPA sets an enforceable standard, the maximum contaminant level (MCL). The MCL generally must be set as close to the MCLG as is "feasible" using the best technology or other means available, taking costs into consideration.

EPA has relied on legislative history to determine the meaning of "feasible." Most recently, the Senate report accompanying the 1996 amendments stated that feasible means the level that can be reached by large, regional drinking water systems applying best available treatment technology. The report explained that this approach is used because 80% of the population receives its drinking water from large community water systems, and thus, safe water can be provided to most of the population at very affordable costs. (About 80% of the population is served by systems that serve a population of 10,000 or more.) However, because standards are based on cost considerations for large systems, Congress expected that standards could be less affordable for smaller systems. An issue in the 1996 reauthorization debate concerned whether the costs of some standards were justified, given their estimated risk-reduction benefits. As amended, the Act now requires EPA, when proposing a standard, to publish a determination as to whether or not the benefits of a proposed standard justify the costs. If EPA determines that the benefits do not justify the costs, EPA, in certain cases, may promulgate a standard less stringent than the feasible level that "maximizes health risk reduction benefits at a cost that is justified by the benefits."

Recent and Pending Rules. EPA's recent rulemaking activities include a 1998 rule package that expanded requirements to control pathogens, especially *Cryptosporidium* (Interim Enhanced Surface Water Treatment Rule (SWTR)) and disinfectants (e.g., chlorine) and their byproducts (e.g., chloroform) (Stage 1 Disinfectant and Disinfection Byproduct Rule). In 2002, EPA issued the Long Term 1 Enhanced SWTR to improve control of microbial pathogens among small systems. EPA also has issued new rules for several radionuclides, including radium (now in effect), and a revised standard for arsenic that water systems must comply with by January 23, 2006.

EPA has nearly completed several related rulemakings, including a groundwater rule to establish disinfection requirements for systems relying on ground water (this rule is intended to protect against fecal bacteria contamination in these systems); and a rule package (expected in July 2005) that includes the Stage 2 Disinfectants and Disinfection Byproduct Rule and the Long Term 2 Enhanced Surface Water Treatment Rule. These rules build on the rules issued in 1998 to strengthen public health protection from disinfectants, their byproducts, and pathogens. EPA also is working to issue a radon rule, and is evaluating many other contaminants, including perchlorate and MTBE, for possible regulation.

Perchlorate. Perchlorate is the main ingredient of solid rocket fuel and has been used heavily by the Department of Defense (DOD), the National Aeronautics and Space Administration (NASA), and related industries. This highly soluble and persistent compound has been disposed of on the ground for decades, and now has been detected in sources of drinking water that serve more than 11 million people. Perchlorate is known to disrupt the uptake of iodine in the thyroid; thus, perchlorate can affect thyroid function. A key concern is that, if sufficiently severe, impaired thyroid function in pregnant women can impair brain development in fetuses and infants.

EPA identified perchlorate as a candidate for regulation in 1998, but concluded that information was insufficient at that time to make a regulatory determination. EPA listed perchlorate as a priority for further research on health effects and treatment technologies, and for collecting occurrence data. In 2002, EPA issued a controversial draft risk assessment for perchlorate that concluded that potential human health risks of perchlorate exposure include effects on the developing nervous systems and thyroid tumors, based on rat studies that observed benign tumors and adverse effects in fetal brain development. The draft assessment included a revised draft reference dose (RfD) intended to protect the most sensitive groups against these effects. That dose roughly translated to a drinking water standard of 1 part per billion (ppb). EPA's 1999 draft level translated to a standard of roughly 32 ppb.

Because an RfD provides the basis for determining the level at which a standard is set, and because drinking water standards are often used as environmental cleanup standards, the DOD and other major perchlorate users have followed EPA's efforts closely. Interagency debate over the draft assessment persisted, and in March 2003, EPA, the DOD, NASA, and other federal agencies asked the National Research Council (NRC) of the National Academy of Sciences to review the science for perchlorate and EPA's draft risk assessment.

The NRC released its study in January 2005, and broadly agreed with several EPA findings; however, the NRC committee suggested several changes to EPA's draft risk assessment. Among other findings, the committee noted that, unlike rats, humans have multiple mechanisms to compensate for iodide deficiency and thyroid disorders, and that studies in rats are of limited use for quantitatively assessing human health risk associated with perchlorate exposure. The committee recommended that EPA base its assessment on human data. The NRC calculated an RfD for perchlorate that incorporates an uncertainty factor to protect the most sensitive populations; that RfD would translate to a drinking water equivalent level of 24.5 ppb. (In developing an MCLG, EPA would likely lower this number to reflect the amount of perchlorate exposure that EPA determines comes from other sources, especially food.) In February, EPA adopted the NRC's recommended reference dose. (For further discussion, see CRS Report RS21961, *Perchlorate Contamination of Drinking Water: Regulatory Issues and Legislative Actions*.)

Congressional interest in this issue continues, and perchlorate legislation has been offered again in the 109th Congress. H.R. 213 would require EPA to promulgate a drinking water standard for perchlorate by July 31, 2007. The 108th Congress passed several perchlorate measures. The Department of Defense Authorization Act of FY2004 (P.L. 108-136) required DOD to provide for health studies of perchlorate in drinking water. The DOD FY2004 Appropriations Act (P.L. 108-87) directed DOD, with EPA, to study perchlorate groundwater pollution that threatens drinking water and irrigation supplies in the Southwest. The National Defense Authorization Act for FY2005 (P.L. 108-375) included a "Sense of

Congress" that DOD should develop a plan for remediating perchlorate contamination resulting from DOD activities to ensure DOD can respond quickly once a federal drinking water standard is established; continue remediating sites where perchlorate contamination poses an imminent and substantial endangerment to human health and welfare; develop a plan to remediate contamination when the Secretary determines that the contamination poses a health hazard; and continue evaluating sites, even in the absence of an SDWA standard. Also, S. 2550 (S.Rept. 108-386), a water infrastructure bill, would have required the U.S. Geological Survey to conduct a national survey on perchlorate contamination. Several other bills would have required EPA to promulgate a drinking water standard for perchlorate.

Lead in Drinking Water. Lead from various sources (including paint in older homes, soil, and water) poses one of the main environmental threats to children's health. In 2004, the issue of lead contamination reemerged in Washington, D.C., where water monitoring revealed marked increases in the levels of lead in tap water in recent years. The local water authority's limited response to the monitoring results severely damaged public trust in the local water supply. These events led policy makers and EPA to examine the effectiveness of the lead rule, particularly its monitoring and public notification requirements, as well as compliance with the regulation. In the 108th Congress, hearings were held by the House Energy and Commerce Committee (July 22, 2004), the House Government Reform Committee (March 5 and May 21, 2004), and the Senate Environment and Public Works Committee (April 7, 2004). H.R. 4268 and S. 2377 were introduced to strengthen the regulation of lead in drinking water and to remediate lead in school drinking water. S. 2550, a water infrastructure financing bill, also included lead provisions.

Lead Rule Overview. In 1991, EPA issued the Lead and Copper Rule (56 *FR* 26460) to replace an interim lead regulation that included a standard of 50 parts per billion (ppb) that was outdated and not protective of public health. Epidemiological research had shown that adverse health effects from exposures to lead occur at lower levels and are worse than previously thought, particularly for infants and children. (There is no known safe level of exposure to lead, and recent studies suggest that very low levels of lead may adversely affect children's neurological development.) In 1988, EPA had proposed a regulation that would have established an enforceable lead standard (maximum contaminant level (MCL)) of 5 ppb applicable to water leaving the treatment plant and also would have required a treatment technique (corrosion control) to further reduce lead in drinking water. Commenters on the proposal expressed concern that a standard applicable at the treatment plant would not indicate the amount of lead in tap water, and that compliance at the tap was essential. EPA and utilities were concerned that an MCL applied at the tap would not be feasible because lead in household plumbing could be a major cause of violations of a lead standard applied at the tap — a situation beyond the control of the water system. This issue reflected the problem with regulating lead. Unlike most contaminants, lead is not normally present in water as it leaves the treatment plant; rather, lead occurs in drinking water primarily as a corrosion by-product, entering water as it travels through pipes in the distribution system and in household plumbing. The primary sources of lead in drinking water are lead pipes, lead solder that has been used in plumbing systems, and brass plumbing fixtures that contain lead.

The final Lead and Copper Rule (LCR) did not include an enforceable standard. Instead, the LCR established a treatment technique (corrosion control) to prevent lead from leaching into drinking water. (Optimizing corrosion control is a complex process, and the "optimal"

treatment can change as water characteristics change and as utilities add new treatment processes to meet other drinking water regulations.)

The lead rule established a lead "action level" of 15 ppb at the tap, based on the 90th percentile level of water samples. Water systems are required to sample tap water in homes and buildings that are at high risk of lead contamination. If lead concentrations exceed 15 ppb in more than 10% of taps sampled, the system is required, within 60 days, to inform customers about lead's health effects and sources, and what can be done to reduce exposure. The system must continue to deliver educational materials as long as it exceeds the action level. If the system continues to exceed the action level after installing optimal corrosion control, it must replace 7% of the lead service lines under its ownership each year, and must offer to replace the privately owned portion of a service line (at the owner's expense).

Federal and Local Efforts. EPA, the D.C. Water and Sewer Authority (WASA), and other local officials worked with the U.S. Army Corps of Engineers to determine the cause of the elevated lead levels in the District of Columbia. (The Corps treats and supplies water from the Washington Aqueduct to the District and several communities.) It appears that changes in treatment processes, made by the Corps to comply with another EPA regulation, made the water more corrosive, thus causing more lead to be leached from lead pipes in the distribution system and from lead plumbing inside homes and other buildings. In late 2000, the Corps changed the chemicals in its secondary disinfection treatment from free chlorine to chloramines to comply with an EPA regulation that placed strict limits on disinfection byproducts. Starting with the monitoring period, July 2001 through June 2002, more than 10% of tap water samples taken by WASA exceeded the lead action level.

The Corps of Engineers began testing a new corrosion control treatment process in June 2004. In August 2004, EPA approved use of the process for the entire Aqueduct service area and imposed supplemental monitoring and reporting requirements on the affected public water systems. Additionally, EPA determined that WASA had failed to comply with numerous lead sampling, public notification, and reporting requirements. EPA and WASA reached a consent agreement that requires WASA to replace more than 1,600 lead service lines, improve its public education program, and upgrade its database management systems.

National Review. EPA has undertaken a national review of lead monitoring by water systems since 2000 to determine whether the lead problem in the District was widespread. By June 2004, EPA had received monitoring data for 744 (89%) of the 834 systems that serve more than 50,000 people. EPA reported that 27 of these systems (3.6%) exceeded the action level at least once since 2000, and 12 of the systems exceeded the action level during 2003. Most (66%) of the systems serving more than 50,000 people reported that the highest level observed during any monitoring period since 2000 was less than 5 ppb. For systems serving between 3,300 and 50,000 people, 237 (3.4%) of 7,833 systems reporting had exceeded the action level since 2000; 76 systems exceeded the action level for monitoring period ending after January 2003. Most systems (71%) in this size category reported that the highest level of lead observed since 2000 was less than 5 ppb. In October 2004, EPA announced that the national data from 73,000 water utilities demonstrated that lead in drinking water is not a widespread problem.

EPA also has been assessing national compliance with the lead rule and reviewing the rule to determine whether major changes are needed. Parts of the regulation that are receiving

most scrutiny include the public notification, monitoring, and lead service line replacement requirements. In November, EPA issued a guidance memo to clarify sampling requirements. In March 2005, EPA initiated a Drinking Water Lead Reduction Plan, based on its review of the lead rule. Under the plan, EPA intends to tighten and clarify monitoring and public notification requirements, and revise treatment and lead service line replacement requirements. EPA plans to propose changes to the lead rule by early 2006. EPA also will revise its 1994 guidance on testing for lead in school drinking water. (See also [http://www.epa.gov/safewater/lcrmr/lead_review.html] and CRS Report RS21831, *Lead in Drinking Water: Washington, D.C., Issue and Broader Regulatory Implications*.)

Methyl Tertiary Butyl Ether (MTBE). For technological and cost reasons, this gasoline additive has been widely used to meet the Clean Air Act requirement that reformulated gasoline (RFG) contain at least 2% oxygen to improve combustion. RFG is required for use in areas that fail to meet the federal ozone standard. However, numerous incidents of water contamination by MTBE have led to calls for restrictions on its use. Nineteen states, including California and New York, have enacted limits or phase-outs of the additive. EPA has not developed a drinking water standard for MTBE; however, at least 7 states have set their own MTBE drinking water standard.

The primary source of MTBE in drinking water has been petroleum releases from leaking underground storage tank (UST) systems. Once released, MTBE moves through soil and into water more rapidly than other gasoline components, thus making it is more difficult and costly to clean up than conventional gasoline leaks. Although MTBE is considered to be less toxic than some other gasoline components (such as benzene), even small amounts of MTBE can render water undrinkable because of its strong taste and odor. These characteristics have made MTBE use an important issue for water suppliers and consumers.

In 1997, EPA issued a drinking water advisory for MTBE based on consumer acceptability (for taste and smell). Advisories provide information on contaminants that have not been regulated under SDWA. They are not enforceable, but provide guidance to water suppliers and others regarding potential health effects or consumer acceptability. While the MTBE advisory is not based on health effects, EPA states that keeping MTBE levels in the range of 20-40 micrograms per liter (μg/L) or lower for consumer acceptability reasons would also provide a large margin of safety from potential adverse health effects.

EPA has taken steps that could lead to the issuance of a drinking water standard for MTBE. In 1998, EPA included MTBE on a list of contaminants that are potential candidates for regulation. Compounds on the contaminant candidate list are categorized as regulatory determination priorities, research priorities, or occurrence priorities. Because of data gaps on health effects and occurrence, EPA placed MTBE in the category of contaminants for which further occurrence data collection and health effects research are priorities. Thus, although EPA did not select MTBE for regulation, the agency has pursued research to fill data gaps so that a regulatory determination may be made. The next round of determinations is scheduled for 2006, although EPA can make determinations outside of this cycle.

The 108th Congress passed several bills that addressed drinking water contamination by MTBE, but none was enacted. The Senate passed an underground storage tank bill, S. 195 (S.Rept. 108-13), which would have authorized appropriations from the Leaking Underground Storage Tank (LUST) Trust Fund for cleaning up MTBE contamination and

would have added new leak prevention, inspection, and enforcement requirements to the federal tank regulatory program. The comprehensive energy bill, H.R. 6 (H.Rept. 108-375) included a similar range of UST regulatory provisions (but with key differences, including less frequent tank inspection requirements) and authorized trust fund appropriations to address leaks containing MTBE or other oxygenated fuel additives, such as ethanol.

The conference report for H.R. 6 also included a contentious "safe harbor" provision to prohibit products liability lawsuits, alleging manufacturing or design defects, against producers of fuels containing MTBE and renewable fuels, such as ethanol and bio-diesel. The safe harbor provision would not affect liability for remediation costs, drinking water contamination, or negligence; however, with liability for manufacturing and design defects ruled out, plaintiffs would have to demonstrate negligence in the handling of such fuels, a more difficult legal standard to meet. Public water suppliers, and state and local government associations, strongly oppose a safe harbor provision and express concern that it could leave communities paying much of the cost for cleaning up contamination by fuels containing MTBE or renewable fuels. Manufacturers argue that a safe harbor provision is reasonable, given that MTBE has been used to meet federal mandates, and that the key problem lies with leaking tanks, not with MTBE. The House passed the conference report, but a cloture vote failed in the Senate. No further action occurred on this bill.

In the 109th Congress, the House Energy and Commerce Committee has offered a discussion draft energy bill that is essentially the same as H.R. 6. In the Senate, S. 606 includes similar LUST and MTBE provisions, but excludes the safe harbor for MTBE. (For more information on these issues, see also CRS Report RL32787, *MTBE in Gasoline: Clean Air and Drinking Water Issues*.)

Drinking Water Infrastructure Funding

Drinking Water State Revolving Fund. A persistent SDWA issue concerns the ability of public water systems to upgrade or replace infrastructure to comply with federal drinking water regulations and, more broadly, to ensure the provision of a safe and reliable water supply. In the 1996 SDWA Amendments, Congress responded to growing complaints about the Act's unfunded mandates and authorized a drinking water state revolving loan fund (DWSRF) program to help water systems finance infrastructure projects needed to meet drinking water standards and address the most serious health risks. The program authorizes EPA to award annual capitalization grants to states. States then use their grants (plus a 20% state match) to provide loans and other assistance to systems. Communities repay loans into the fund, thus making resources available for projects in other communities. Eligible projects include installation and replacement of treatment facilities, distribution systems, and certain storage facilities. Projects to replace aging infrastructure are eligible if they are needed to maintain compliance or to further public health protection goals.

Congress authorized funding totaling $9.6 billion, including $1 billion for each of FY1995 through FY2003 for the DWSRF program. To date, Congress has provided roughly $7.8 billion for this program, including $843 million in the FY2005 omnibus spending bill, P.L. 108-447. For FY2006, the President has requested $850 million. Through June 2004, EPA had awarded $5.74 billion in capitalization grants, which, when combined with the state match, bond proceeds, and other funds, amounted to $9.64 billion in DWSRF funds available for loans and other assistance. Through that same period, 6,500 drinking water system

projects had received assistance, and total assistance provided by the program reached $7.98 billion. (For further information, see CRS Report RS22037, *Drinking Water State Revolving Fund: Program Overview and Issues*.)

Funding Issues. The DWSRF program is generally well regarded; however, many organizations and state and local officials argue that greater investment in drinking water infrastructure is needed. EPA's latest survey of capital improvement needs for water systems estimated that communities need to invest $150.9 billion on drinking water infrastructure improvements over 20 years (1999-2018) to comply with existing drinking water regulations and to ensure the provision of safe water. The survey excluded funds needed for compliance with several recent regulations (including the revised arsenic and radium rules) and pending rules for radon and other contaminants; nor did it consider funds needed for security upgrades. These requirements are expected to substantially increase needs estimates.

A related issue is the need for communities to address infrastructure needs that are outside the scope of the DWSRF program and, thus, generally are ineligible for assistance from this source. Ineligible categories include future growth, ongoing rehabilitation, and operation and maintenance of systems. According to EPA, outdated and deteriorated drinking water infrastructure poses a fundamental long-term threat to drinking water safety, and in many communities, basic infrastructure costs could far exceed SDWA compliance costs.

In 2002, EPA issued *The Clean Water And Drinking Water Infrastructure Gap Analysis*, which identified potential funding gaps between projected needs and spending from 2000 through 2019. This analysis estimated the potential 20-year funding gap for drinking water and wastewater infrastructure capital and operations and maintenance (O&M), based on two scenarios: a "no revenue growth" scenario and a "revenue growth" scenario that assumed spending on infrastructure would increase 3% per year. Under the "no revenue growth" scenario, EPA projected a funding gap for drinking water capital investment of $102 billion (roughly $5 billion per year) and an O&M funding gap of $161 billion ($8 billion per year). Using revenue growth assumptions, EPA estimated a 20-year capital funding gap of $45 billion ($2 billion per year), and no gap for O&M.

Other needs assessments also reveal a funding gap. A Congressional Budget Office study, *Future Investment in Drinking Water and Wastewater Infrastructure*, concluded that current funding from all levels of government, combined with current revenues from ratepayers, will not be sufficient to meet the nation's future demand for water infrastructure. In 2000, the Water Infrastructure Network (WIN) (a coalition of state and local officials, water service providers, environmental groups and others) reported that, over the next 20 years, water and wastewater systems need to invest $23 billion annually more than current investments to meet SDWA and Clean Water Act health and environmental priorities and to replace aging infrastructure. WIN and other groups have presented proposals to Congress for multi-billion dollar investment programs for water infrastructure. Others, however, have called for more financial self-reliance within the water sector.

In response to EPA's Gap Analysis, EPA's budget request for FY2004 proposed that funding for the DWSRF program be continued at a level of $850 million annually through FY2018. EPA's budget justification explained that this funding level would allow DWSRFs to revolve at a cumulative level of $1.2 billion (more than double the previous goal of $500 million) and would help close the funding gap for drinking water infrastructure needs.

In the face of large needs, tight budgets, and debate over the federal role in funding water infrastructure, EPA, states, and utilities have been examining alternative management and financing strategies to address costs. Strategies include establishing public-private partnerships (privatization options range from contracting for services to selling system assets), improving asset management, and adopting full-cost pricing for water services.

In the 108th Congress, several bills were introduced to increase DWSRF funding levels. S. 2550 (S.Rept. 108-386), a water infrastructure financing bill, would have authorized $15 billion over five years for the DWSRF and required states to reserve a portion of their DWSRF grant to make grants for up to 55% of project costs to qualified communities. The committee adopted various amendments, including a contentious provision that would have applied Davis-Bacon prevailing wage requirements, in perpetuity, to projects receiving DWSRF assistance. (For details, see CRS Report RL32503, *Water Infrastructure Financing Legislation: Comparison of S. 2550 and H.R. 1560*.)

Drinking Water Security

Congress addressed drinking water security issues in the Bioterrorism Preparedness of 2002 (P.L. 107-188, H.Rept. 107-481), which amended SDWA to require community water systems to conduct vulnerability assessments and prepare emergency response plans. In the 108th Congress, attention focused on several issues including the progress utilities have made in meeting the requirements of the Bioterrorism Act and in addressing identified vulnerabilities, and whether utilities need more resources to make security improvements. S. 2269 would have authorized EPA to make grants to utilities to improve security and authorized funds for the Water Information Sharing and Analysis Center (Water ISAC).

A key provision of the Bioterrorism Act required each community water system serving more than 3,300 individuals to assess their vulnerability to terrorist attacks or other intentional acts to disrupt the provision of a safe and reliable drinking water supply. Combined, these systems serve more than 90% of the population served by community water systems. The Act required these systems to certify to EPA that they conducted a vulnerability assessment and to give EPA a copy of the assessment. The Act also required these systems to prepare or revise emergency response plans incorporating the results of the vulnerability assessments no later than six months after completing them. Table 2 outlines the schedule for utilities to submit their assessments to EPA and to complete emergency response plans.

Table 2. Community Water System Requirements under the Bioterrorism Act

System size by population (approx. no. of systems)	Vulnerability assessments must be completed (% completed as of 10/1/04)	Emergency response plans must be completed (% certified as of 10/1/04)
100,000 or more (425)	March 31, 2003 (100%)	September 30, 2003 (100%)
50,000 - 99,999 (460)	December 31, 2003 (98%)	June 30, 2004 (99%)
3,301 - 49,999 (7,500)	June 30, 2004 (88%)	December 31, 2004 (NA)

The Bioterrorism Act authorized $160 million for FY2002, and sums as may be needed for FY2003 through FY2005, to provide financial assistance to community water systems to assess vulnerabilities, prepare response plans, and address security enhancements and significant threats. The emergency supplemental appropriations for FY2002 (P.L. 107-117) provided $90 million for assessing the vulnerabilities of drinking water utilities and other security planning, and $5 million for state grants for assessing drinking water safety. In FY2002, EPA awarded roughly $53 million in water security grants to help the largest public water systems complete vulnerability assessments by the March 31, 2003 deadline.

Federal grants were not available for smaller systems covered by the Bioterrorism Act's requirements. Instead, EPA, states and water organizations have provided vulnerability assessment tools, guidance documents, training, and technical assistance to support security enhancement efforts among these systems. Similar assistance is also being provided for remaining 84% of community water systems that serve 3,300 or fewer and are not required to do vulnerability assessments and emergency planning.

For FY2003, EPA requested $16.9 million for vulnerability assessments for small and medium-sized systems and $5 million for state water security coordinators to work with EPA and utilities in assessing water security. P.L. 108-7 included this amount, plus $2 million for the National Rural Water Association to help small systems with vulnerability assessments, and $1 million to the American Water Works Association to provide security training.

For FY2004, EPA requested and received $32.4 million for critical water infrastructure protection, including $5 million for state water security coordination grants. This funding supported states' efforts to work with water and wastewater systems to develop and enhance emergency operations plans; conduct training in the implementation of remedial plans in small systems; and develop detection, monitoring and treatment technology to enhance water security. EPA used funds to assist the nearly 8,000 community water systems that serve water to populations between 3,300 and 100,000 and are subject to the Bioterrorism Act.

For FY2005, EPA requested $5 million for state water security coordination grants and $6.1 million for other critical infrastructure protection efforts. EPA's budget justification explained that the $21.3 million reduction reflected a shift in priorities from assistance and training on vulnerability assessments. The Consolidated Appropriations Act for FY2005 provided this amount, including $2 million for the Water Information Sharing and Analysis Center, which shares sensitive security information with water systems.

In the FY2006 budget request, the President again has requested $5 million for state water security grants. The President also has requested $44 million to launch two new drinking water security initiatives, the Water Sentinel and the Water Alliance for Threat Reduction, in response to EPA's water security responsibilities under Homeland Security Presidential Directive (HSPD) 7, which designated EPA as the lead agency for water infrastructure security. The goal of the Water Sentinel initiative is to establish pilot early warning systems through intensive water monitoring and surveillance for certain chemical and biological contaminants in five cities, and to form a water laboratory alliance to build the analytical capacity needed to support the surveillance program. Under the Water Alliance for Threat Reduction initiative, EPA will work to ensure that large systems have the tools and information needed to prevent, detect, and respond to attacks. (See also CRS Report RL31294, *Safeguarding the Nation's Drinking Water: EPA and Congressional Actions*.)

Small Systems Issues

A key SDWA issue involves the financial, technical, and managerial capacity of small systems to comply with SDWA regulations. Roughly 84% of the nation's community water systems are small, serving 3,300 persons or fewer; 57% of the systems serve 500 persons or fewer. EPA and states have documented the problems many small systems face in meeting SDWA rules, and more fundamentally, in ensuring the quality of water supplies. Major problems include deteriorated infrastructure; lack of access to capital; limited customer and rate base; inadequate rates; diseconomies of scale; and limited technical and managerial capabilities. Although these systems serve just 9% of the population served by community water systems, the sheer number of small systems creates challenges for policymakers.

In the earliest SDWA debates, Congress recognized that setting standards based on technologies that are affordable for large cities could pose problems for small systems. During the reauthorization debate leading up to the 1996 amendments, policymakers gave considerable attention to the question of how to help small systems improve their capacity to ensure consistent compliance with the SDWA. The 1996 amendments added provisions aimed at achieving this goal, including a requirement that states establish strategies to assist systems in developing and maintaining the technical, financial and managerial capacity to meet SDWA regulations. Congress also revised provisions on standard-setting, variances, and exemptions to increase consideration of small system concerns.

Small System Variances. As amended in 1996, the SDWA requires EPA, when issuing a regulation, to identify technologies that meet the standard and that are affordable for systems that serve populations of 10,000 or fewer. If EPA does not identify "compliance" technologies that are affordable for these systems, then EPA must identify small system "variance" technologies. A variance technology need not meet the standard, but must protect public health. States may grant variances to systems serving 3,300 persons or fewer, if a system cannot afford to comply with a rule (through treatment, an alternative source of water, or other restructuring) and the system installs a variance technology. With EPA approval, states also may grant variances to systems serving between 3,300 and 10,000 people.

To date, EPA has determined that affordable compliance technologies are available for all drinking water regulations. Consequently, the agency has not identified any small system variance technologies, and *no small system variances are available*. If EPA had identified variance technologies, states still might not make much use of these variances for a number of reasons — a key issue being the creation of a double standard for tap water quality in communities that meet a standard, compared with those that would rely on variances.

Exemptions. The Act's exemption provisions also are intended to provide compliance flexibility in certain cases. States or EPA may grant temporary exemptions from a standard if, due to certain compelling factors (including cost), a system cannot comply on time. For example, all systems are required to comply with the new arsenic standard five years after its promulgation date. An exemption would allow three more years for qualified systems. Small systems (serving 3,300 persons or fewer) may be eligible for up to three additional two-year extensions, for a total exemption duration of nine years (for a total of up to 14 years to achieve compliance). In the preamble to the arsenic rule published in January 2001, EPA noted that exemptions will be an important tool to help states address the number of systems needing financial assistance to comply with this rule and other SDWA rules (66 *FR* 6988).

Affordability Issues and Arsenic Compliance. Prompted by intense debate over the revised arsenic standard and its potential cost to small communities, the conference report for EPA's FY2002 appropriations (H.Rept. 107-272) directed EPA to review its affordability criteria and how small system variance and exemption programs should be implemented for arsenic. Congress directed EPA to report on its affordability criteria, administrative actions, potential funding mechanisms for small system compliance, and possible legislative actions.

EPA's report to Congress, *Small Systems Arsenic Implementation Issues,* summarized activities that addressed these directives. Major activities included (1) reviewing the small system affordability criteria and variance process; (2) developing a small community assistance plan to improve access to financial and technical assistance, improve compliance capacity, and simplify the use of exemptions; and (3) implementing a $20 million research and technical assistance strategy. EPA has completed several efforts to help states and water systems meet the requirements of the arsenic rule. In August 2002, EPA issued *Implementation Guidance for the Arsenic Rule,* which includes guidance to help states grant exemptions. EPA has offered technical assistance and training to small systems, and is sponsoring research on low-cost treatment technologies for removing arsenic from drinking water. Also, EPA is working with small communities to maximize loans and grants under SDWA and the U.S. Department of Agriculture water infrastructure programs.

Water systems must comply with the new arsenic standard by January 23, 2006, and Congress has shown ongoing concern about compliance costs. The conference report for the Consolidated Appropriations Act for FY2005 directs EPA to report, by August 2005, on the extent to which communities will be impacted by the arsenic rule, and to propose compliance alternatives and make recommendations to minimize compliance costs. Congress also provided $8.3 million for research on cost-effective arsenic removal technologies, which could reduce compliance costs. In the 109th Congress, S. 41 has been introduced to require states to grant small community water systems exemptions from regulations for naturally occurring contaminants in certain cases; a similar bill was offered in the 108th Congress. Also, in the past Congress, H.R. 3328/S. 1432 and S. 2550 all proposed to establish a small system grant program to help qualified communities comply with drinking water standards.

LEGISLATION

H.R. 213 (Solis)

The Safe Drinking Water for Healthy Communities Act of 2005 amends SDWA to require EPA to promulgate a drinking water standard for perchlorate by July 31, 2007. Introduced Jan. 4, 2005; referred to the Committee on Energy and Commerce.

H.R. 879 (Dingell)

Amends the Solid Waste Disposal Act to require secondary containment for all new and replaced underground storage tank systems located near public water systems and private drinking water wells to prevent contamination by petroleum and MTBE. Introduced on Feb. 17, 2005; referred to the Committee on Energy and Commerce.

S. 41 (Nelson, E. Benjamin)

Amends SDWA to direct states to grant small, nonprofit water systems exemptions from drinking water regulations for naturally occurring contaminants, in certain cases. Introduced Jan. 24, 2005; referred to the Committee on Environment and Public Works.

CONGRESSIONAL HEARINGS, REPORTS, AND DOCUMENTS

U.S. Congress. House. Committee on Energy and Commerce. Subcommittee on Environment and Hazardous Materials. *Tapped Out: Lead in the District of Columbia and the Providing of Safe Drinking Water*. Hearing, July 22, 2004, 108th Congress, 2nd session. 155 p. (108-97)

——*Drinking Water Needs and Infrastructure.* Hearing, April 11, 2002. 107th Congress, 2nd session. 108 p. (107-107)

U.S. Congress. House. Committee on Government Reform. Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs. *EPA Water Enforcement: Are We on the Right Track?* Hearing, Oct. 14, 2003, 108th Congress, 1st session. 201p. (108-157)

U.S. Congress. House. Committee on Government Reform. *Public Confidence, Down the Drain: the Federal Role in Ensuring Safe Drinking Water in the District of Columbia*. Hearing, March 5, 2004, 108th Congress, 2nd session. 268 p. (108-161)

U.S. Congress. Senate. Committee on Environment and Public Works. *Water Infrastructure Financing Act.* Report to accompany S. 2550. Oct.7, 2004. S.Rept. 108-386. 116 p.

FOR ADDITIONAL READING

National Research Council. *Health Implications of Perchlorate Ingestion*. Committee to Assess the Health Implications of Perchlorate Ingestion. Board on Environmental Studies and Toxicology, Division of Earth and Life Studies. National Academy of Sciences. January 2005. 177 p.

U.S. Congress. Congressional Budget Office. *Future Investment in Drinking Water and Wastewater Infrastructure*. Nov. 2002. 56 p.

U.S. Environmental Protection Agency. *The Clean Water and Drinking Water Infrastructure Gap Analysis Report.* Report No. EPA 816-R-02-020. September 2002. 50 p.