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Safe Drinking Water Act: Implementation and Issues

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CONTENTS

SUMMARY

MOST RECENT DEVELOPMENTS

BACKGROUND AND ANALYSIS

Introduction
- The 1996 SDWA Amendments
- Regulated Public Water Systems

Current Drinking Water Issues
- Regulating Drinking Water Contaminants
  - Standard-Setting
  - Recent and Pending Rules
  - Perchlorate
  - Methyl Tertiary Butyl Ether (MTBE)
- Drinking Water Infrastructure Funding
  - Drinking Water State Revolving Fund
  - Funding Issues
- Drinking Water Security
- Small Systems Issues
  - Small System Variances
  - Exemptions
  - Affordability Issues and Arsenic Compliance

LEGISLATION

CONGRESSIONAL HEARINGS, REPORTS, AND DOCUMENTS

FOR ADDITIONAL READING

Safe Drinking Water Act: Implementation and Issues

SUMMARY

Key drinking water issues on the agenda in the 109th Congress have included problems caused by specific contaminants, such as the gasoline additive methyl tertiary butyl ether (MTBE), and perchlorate, 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 systems remain busy implementing the 1996 amendments.

Congress included provisions in the Energy Policy Act of 2005 (P.L. 109-58, H.R. 6) to address existing MTBE contamination of water and to better prevent future problems. The act authorizes funding from the Leaking Underground Storage Tank Trust Fund for the cleanup of MTBE releases and adds leak prevention provisions to the federal underground storage tank regulatory program. The Energy Policy Act also prevents EPA from regulating the underground injection of fluids (other than diesel fuel) into drinking water sources for hydraulic fracturing purposes related to oil, gas and geothermal production.

Concerns about perchlorate in drinking water also have returned to the congressional agenda, after the past Congress enacted several provisions on this issue. The House passed H.R. 18 and H.R. 186, both of which would establish groundwater remediation programs in California, where most perchlorate contamination has been identified.

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 included requirements for community water systems to conduct vulnerability assessments and prepare emergency response plans. S. 1426 would require EPA to report to Congress on implementation of the water security research provisions of the Bioterrorism Act.

An ongoing SDWA issue involves the growing cost and complexity of drinking water standards and the ability of water systems, especially small 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 FY2006, in P.L. 109-54, Congress has provided $850 million for the DWSRF program, as requested. However, studies show that a large funding gap exists and will grow as SDWA requirements increase and infrastructure ages. On July 20, the Senate Environment and Public Works Committee ordered reported S. 1400, the Water Infrastructure Financing Act, which would increase funding for the DWSRF program and a parallel wastewater program, and provide grant assistance for small and rural communities. H.R. 2417/S. 689 would direct EPA to establish a grant program to help eligible communities comply with drinking water standards and add compliance flexibility for such communities.

MOST RECENT DEVELOPMENTS

On August 8, 2005, the President signed into law the Energy Policy Act of 2005 (P.L. 109-58, H.R. 6). The act authorizes appropriations from the Leaking Underground Storage Tank Trust Fund specifically for EPA and states to address releases of MTBE. It also imposes new leak prevention requirements on EPA, states, and underground storage tank owners to better protect sources of drinking water. The act also exempts from regulation under the Safe Drinking Water Act the underground injection of fluids, except diesel fuel, for hydraulic fracturing purposes related to oil, gas, and geothermal production. (For more information, see CRS Report RL32873, *Key Environmental Issues in the Energy Policy Act of 2005 (P.L. 109-58, H.R. 6)*, coordinated by Brent D. Yacobucci.) EPA's funding bill (P.L. 109-54, H.R. 2361), signed on August 2, includes $850 million for the drinking water state revolving fund (DWSRF) program and $9 million for EPA's 'Water Sentinel' security initiative. On July 20, the Senate Environment and Public Works Committee ordered reported S. 1400, the Water Infrastructure Financing Act, that would increase funding authority for the DWSRF and the Clean Water SRF, and provide other funding for small, rural communities.

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*, by Mary Tiemann.)

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.

Significant progress has been made since the enactment of SDWA. 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 some159,000 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, 52,838 are *community water systems* (CWS) 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 18,650 public water systems are *non-transient, non-community water systems* (NTNCWS), 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 84,740 systems are *transient non-community water systems* (TNCWS) (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 52,838 community water systems, roughly 84% serve 3,300 or fewer people. While large in number, these systems provide water to just 9% of the population served by all community systems. In contrast, 8% of community water systems serve more than 10,000 people, and they provide water to 81% of the population served. Fully 85% (16,545) of non-transient, non-community water systems and 97% (84,740) 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)	30,006	4.96	57%	2%
Small (501-3,300)	14,212	20.14	27%	7%
Medium (3,301-10,000)	4,707	27.35	9%	10%
Large (10,001-100,000)	3,541	99.81	7%	37%
Very large (>100,000)	372	120.25	1%	44%
Total	**52,838**	**272.5**	**100%**	**100%**

Source: Adapted from: US Environmental Protection Agency, *Factoids: Drinking Water and Ground Water Statistics for 2004*. Available at [http://www.epa.gov/safewater/data/pdfs/data_factoids_2004.pdf].

Current Drinking Water 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 (STR)) 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 STR to improve control of microbial pathogens among small systems. (Fact sheets and other information on these rules are available at [http://www.epa.gov/safewater/mdbp/mdbp.html].) 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 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. Additionally, EPA expects to issue a radon rule in December 2006, 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*, by Mary Tiemann.)

In the 109th Congress, interest in perchlorate contamination continues. The House has passed two bills to address perchlorate-contaminated groundwater in California: H.R. 186 would authorize the Secretary of the Interior to make grants to the Santa Clara Valley Water District for groundwater remediation projects; H.R. 18 would similarly authorize grants for local water authorities within the Santa Anna River watershed. Additionally, 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.

Methyl Tertiary Butyl Ether (MTBE). 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. At least 25 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 seven states have set their own MTBE 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 likely to reach drinking water sources. EPA estimates that UST leaks involving MTBE can be two to four times more costly to clean up than conventional gasoline leaks, which generally cost from $100,000 to $125,000 to remediate.

Because of data gaps, EPA has not issued a health advisory or drinking water standard for MTBE; however, EPA's Office of Research and Development concluded in 1993 that the inhalation evidence would support classifying MTBE as a "possible human carcinogen."[1] In 1997, EPA issued a drinking water advisory for MTBE based on consumer acceptability (for taste and smell), because even small amounts of MTBE can render water undrinkable because of its strong taste and odor. Advisories provide information on contaminants that are not 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 stated at that time 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

[1] U.S. Environmental Protection Agency, *Health Risk Perspectives on Fuel Oxygenates*, Office of Research and Development, EPA 600/R-94/217, 1994, p. 8. For more detail, see EPA's MTBE risk assessment, *Assessment of Potential Health Risks of Gasoline Oxygenated with Methyl Tertiary Butyl Ether (MTBE)*, EPA/600/R-93/206, 1993, [http://www.epa.gov/ncea/pdfs/mtbe/gasmtbe.pdf].

determination priorities, research priorities, or occurrence priorities. 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 planned to pursue research to fill data gaps so that a regulatory determination may be made. However, most current MTBE research is focused on inhalation risks, and very little research is being done specifically to assess the risks of exposure to MTBE via drinking water. The next round of regulatory determinations is scheduled for 2006, although EPA can select contaminants for regulation outside of this cycle.

The Energy Policy Act of 2005 (P.L. 109-58, H.R. 6), adds new leak prevention provisions to the UST regulatory program and authorizes funding specifically for the remediation of petroleum tank leaks that involve MTBE. Among its provisions, the act adds tank inspection and operator training requirements, and requires EPA or a state, when determining the portion of cleanup costs to recover from a tank owner, to consider the tank owner's ability to pay for cleanup and still maintain business operations. It authorizes the appropriation of $200 million from the LUST Trust Fund annually for five years for addressing leaks involving MTBE or renewable fuels (e.g., ethanol), and another $200 million annually for five years for EPA and states to administer the general leaking petroleum tank cleanup program. H.R. 6 allows EPA and states to use LUST funds to enforce UST leak prevention regulations and authorizes Trust Fund appropriations for this purpose. It also removes the Clean Air Act oxygenated fuel requirement, and extends the LUST Trust Fund tax through March 2011. House and Senate provisions limiting MTBE use were dropped in conference. A Senate provision authorizing EPA to regulate or prohibit the sale any motor fuel or additive if it caused water pollution also was dropped in conference. (For more details see CRS Report RL32865, *Renewable Fuels and MTBE: A Comparison of Selected Provisions in the Energy Policy Act of 2005 (H.R. 6)*, by Brent D. Yacobucci, et al.; CRS Report RL32787, *MTBE in Gasoline: Clean Air and Drinking Water Issues*, by James E. McCarthy and Mary Tiemann; and CRS Report RS21201, *Leaking Underground Storage Tanks: Program Status and Issues*, by Mary Tiemann.)

As in the previous Congress, the House version of H.R. 6 included a retroactive "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 biodiesel. The provision stated that it does not affect other liability (such as liability for cleanup costs or negligence for spills). With liability ruled out for design defects, manufacturing defects, and failure to warn of hazardous products, MTBE manufacturers would likely be more difficult to reach under these other bases of liability. (For a discussion of legal issues, see CRS Report RS21676, *The Safe Harbor Provision for Methyl Tertiary Butyl Ether (MTBE)*, by Aaron M. Flynn.) The safe harbor provision was opposed by many state attorneys general, the Western Coalition of Arid States, the National Association of Counties, the National Association of Towns and Townships, the National League of Cities, the National Water Resources Association, the U.S. Conference of Mayors, and community water suppliers. Opponents argued that providing a products liability shield would effectively leave gas station owners liable for cleanup, and because these businesses often have few resources, the effect of the safe harbor provision would be that the burden for cleanup would fall to local communities, drinking water utilities, the states, and private well owners. MTBE manufacturers argued that a safe harbor provision was reasonable, given that MTBE has been used to meet federal Clean Air Act mandates, and that the key problem lies with leaking tanks, not with MTBE. The Senate bill included a safe harbor for renewable

fuels but not MTBE, and it was not retroactive. Unable to work out a broadly acceptable compromise, conferees dropped the safe harbor provision from the legislation.

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. Congress has provided roughly $8.65 billion for this program, including, in P.L. 109-54, $850 million for FY2006, as requested. Congress provided roughly $843 million for FY2005. 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*, by Mary Tiemann.)

Funding Issues. The DWSRF program is well regarded, but many organizations and state and local officials argue that greater investment in drinking water infrastructure is needed. EPA's 2005 survey of capital improvement needs for water systems estimates that water systems need to invest $276.8 billion on drinking water infrastructure improvements over 20 years to comply with drinking water regulations and to ensure the provision of safe water. The survey includes funds needed for compliance with several recent regulations (including the revised arsenic and radium rules) and pending rules for radon and other contaminants. The survey also identified $1 billion in security-related needs. EPA reports that, although all of the infrastructure projects in the needs assessment promote the health objectives of the act, roughly $45.1 billion (16.3%) of the total need is attributable to SDWA regulations. Of this amount, $35.2 billion is needed to address existing regulations, and $30.2 billion (86%) is needed for projects to address microbiological contamination.

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 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.

Infrastructure needs and funding issues continue to receive attention in the 109th Congress. On July 20, the Senate Environment and Public Works Committee ordered reported S. 1400, the Water Infrastructure Financing Act. This bill would amend SDWA and the Clean Water Act to reauthorize both acts' SRF programs (authorizing $15 billion over five years for the DWSRF). It also would direct EPA to establish grant programs for small or economically disadvantaged communities for critical drinking water and water quality projects; authorize loans to small water and wastewater systems for preconstruction, short-term, and small project costs; and direct EPA to establish a demonstration program to promote new technologies and alternative approaches to water quality and water supply management, among other purposes. At markup, committee members adopted an amendment that would apply Davis-Bacon prevailing wage requirements, in perpetuity, to projects receiving DWSRF assistance. The same committee reported similar legislation in the past Congress, S. 2550 (S.Rept. 108-386), but contentious amendments, including a similar Davis-Bacon amendment, were adopted at markup, and that bill was not taken up on the

Senate floor. (For a broader discussion of water infrastructure issues, see CRS Report RL31116, *Water Infrastructure Needs and Investment: Review and Analysis of Key Issues*, by Claudia Copeland and Mary Tiemann.)

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 (new SDWA section 1433). The act also added sections 1434 and 1435, directing EPA to review methods by which terrorists or others could disrupt the provision of safe water supplies and to review methods for preventing, detecting, and responding to disruptions. In July, 2005, S. 1426 was introduced to reauthorize appropriations for sections 1434 and 1435, and to require EPA to report to Congress on progress and problems with their implementation.

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 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 deadlines by which utilities had to submit their assessments to EPA and 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	Emergency response plans must be completed
100,000 or more (425)	March 31, 2003	September 30, 2003
50,000 - 99,999 (460)	December 31, 2003	June 30, 2004
3,301 - 49,999 (7,500)	June 30, 2004	December 31, 2004

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. Essentially all systems met that 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 also has been provided for the remaining 84% of community water systems that serve 3,300 or fewer and were 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 requested $5 million for state water security grants. The President also requested $44 million to launch a new drinking water security initiative, the Water Sentinel, 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 in five cities through water monitoring and surveillance for certain chemical and biological contaminants, and to form a water laboratory alliance to build the analytical capacity needed to support the surveillance program. For this security initiative, EPA's FY2006 appropriations bill (P.L. 109-54, H.R. 2361) provides $9 million, as proposed by the House; the Senate had proposed $5.6 million. In H.Rept. 109-80, the House Appropriations Committee stated that EPA should develop clear goals for the Water Sentinel program and justify the request more clearly next year. Congress also provided the $5 million requested for state water security grants. (See also CRS Report RL31294, *Safeguarding the Nation's Drinking Water: EPA and Congressional Actions*, by Mary Tiemann.)

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). However, because of the administrative burden to the state, the exemption authority may not be widely used.

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 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 directed 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. (This report is pending.) Congress also provided $8.3 million for research on cost-effective arsenic removal technologies.

In the 109th Congress, S. 41 and H.R. 1315 have been introduced to require states to grant small community water systems exemptions from regulations for naturally occurring contaminants in certain cases. Companion bills, H.R. 2417 and S. 689, would require EPA to establish a small system grant program to help qualified communities comply with standards, delay state enforcement of the arsenic rule until states implement the grant program, and prevent EPA from enforcing a standard during the grant application process; funding for the program would be authorized at $1.9 million annually for six years. S. 1400, the Water Infrastructure Financing Act, would establish a grant program for priority projects, including projects to help small systems comply with standards.

LEGISLATION

H.R. 213 (Solis)

Amends SDWA to require EPA to issue a drinking water standard for perchlorate by July 31, 2007. Introduced January 4, 2005; referred to the Committee on Energy and Commerce.

H.R. 879(Dingell)/S. 439 (Boxer)

These very similar bills amend the Solid Waste Disposal Act to require secondary containment for all new and replaced underground storage tank systems located near public water systems, potable drinking water wells, and state-designated sensitive areas to prevent contamination by petroleum and MTBE. Both were introduced on February 17, 2005; H.R.

879 was referred to the Committee on Energy and Commerce. S. 439 was referred to the Committee on Environment and Public Works.

H.R. 1315 (Otter)

Amends SDWA to require states to grant temporary exemptions to small water systems from the requirements of regulations for naturally occurring contaminants (e.g., arsenic and radium). Introduced March 15, 2005; referred to the Committee on Energy and Commerce.

H.R. 1540 (Miller, Gary)

Amends SDWA civil suit provisions to establish liability standards for public water systems regarding damages arising from injuries allegedly caused by the delivery of water containing regulated or unregulated contaminants. Introduced April 8, 2005; referred to the Committee on Energy and Commerce, and the Committee on the Judiciary.

H.R. 1679 (Andrews, Robert E.)

Authorizes supplemental appropriations for the DWSRF of $85 million for state expenses of formulating source water assessment programs; specifies that the programs must include the assessment of specified pesticides, surface water sources, residential wells, and contaminated soil. Introduced April 19, 2005; referred to the Committee on Appropriations.

H.R. 2417 (Wilson, H.)/S. 689 (Domenici)

Amends SDWA to direct EPA to establish a program to provide grants to eligible communities for projects needed to comply with drinking water standards; provides temporary relief from enforcement of standards during the grant application process; delays state enforcement of the arsenic rule until the state implements the grant program. H.R. 2417 was introduced May 17, 2005; referred to the Committee on Energy and Commerce. S. 689 was introduced April 4, 2005; referred to the Committee on Environment and Public Works.

H.R. 3178 (Norton)/S. 1328

Amends SDWA to (1) require EPA to revise the drinking water regulation for lead, establish a maximum contaminant level for lead, and revise monitoring requirements; (2) increase the pace at which lead service lines are replaced; (3) revise public notification and education requirements for water systems and require the provision of in-home filters when the standard or action level is exceeded; (4) authorize appropriations for a lead service line replacement fund; (5) reduce the amount of lead allowed in plumbing; and (6) require EPA to issue regulations for testing and remediating lead in school drinking water. H.R. 3178 was introduced June 30, 2005; referred to the Committee on Energy and Commerce. S. 1328 was introduced June 29, 2005; referred to the Committee on Environment and Public Works.

H.R. 4198 (Andrews)

Amends SDWA provisions requiring EPA to conduct studies on the health effects of drinking water contaminants on sensitive subpopulations (e.g., infants and children) to require that the studies include an evaluation of morbidity and endocrine disruptors; amends reporting requirements to require EPA to ensure that related reports to Congress include statistics on health effects as determined by rates of occurrence by age and gender. Introduced November 2, 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 January 24, 2005; referred to the Committee on Environment and Public Works.

S. 837 (Inhofe)

Amends SDWA to exempt hydraulic fracturing related to oil and gas production from the definition of underground injection and, thus, exclude this practice from potential underground injection regulations related to the protection of underground sources of drinking water. (Parallels H.R. 6, Section 327.) Introduced April 18, 2005; referred to the Committee on Environment and Public Works.

S. 1080 (Jeffords)

Amends SDWA to prohibit the use of diesel fuel and other toxic substances for hydraulic fracturing practices related to oil and natural gas production. Introduced May 19, 2005; referred to the Committee on Environment and Public Works.

S. 1400 (Chafee)

The Water Infrastructure Financing Act amends SDWA and the Clean Water Act to amend and reauthorize both acts' SRF programs; direct EPA to establish grant programs for small or economically disadvantaged communities for critical drinking water and water quality projects; authorize loans to small water and wastewater systems for preconstruction and small project costs; require the National Academies of Science to study the availability of no- and low-lead plumbing components; authorize funding for lead service line replacement in the District of Columbia; direct EPA to establish a demonstration grant program to promote new technologies and alternative approaches to water quality and water supply management; authorize EPA to establish an agricultural pollution control technology grant program; and for other purposes. Introduced July 14, 2005; referred to the Committee on Environment and Public Works; ordered reported, amended, July 20, 2005.

S. 1409 (Murkowski)

Amends and reauthorizes Section 303 of the 1996 SDWA Amendments to authorize EPA to make grants to Alaska to pay 75% of the cost of water and wastewater systems for rural and Native villages in Alaska. Introduced July 14, 2005; referred to the Committee on Environment and Public Works; reported, amended, October 24, 2005 (S.Rept. 109-159).

S. 1426 (Obama)

Amends SDWA to reauthorize appropriations for water security Sections 1334 and 1435 regarding contaminant prevention, detection, and response, and to require a report to Congress on progress and problems in implementing these provisions. Introduced July 19, 2005; referred to the Committee on Environment and Public Works.

S. 1709 (Inhofe)

Amends the Clean Water Act to add flexibility to the clean water SRF program to facilitate repair of sewage treatment infrastructure damaged by Hurricane Katrina; authorizes EPA, when requested by homeowners, to test private wells potentially contaminated as a result of Hurricane Katrina or a related condition. Introduced September 15, 2005 referred to the Committee on Environment and Public Works; passed Senate September 28.

S.Amdt. 2162 to H.R. 3058 (Knollenberg)

Directs the Secretary of the Treasury to submit a report to the House and Senate appropriations committees to provide the legal basis for applying arbitrage bond regulations to the reserve funds held by the clean water and drinking water SRFs that generally contain replacement proceeds, not bond proceeds. Senate agreed to amendment on October 20, 2005.

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. (H.Rept. 108-97)

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. (H.Rept. 108-161)

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, October 14, 2003, 108th Congress, 1st session. 201p. (H.Rept. 108-157)

U.S. Congress. House. Committee on Transportation and Infrastructure. Subcommittee on Water Resources and Environment. *Aging Water Supply Infrastructure*. Hearing, April 28, 2004, 108th Congress, 2nd session. 78 p. (H.Rept. 108-63)

U.S. Congress. Senate. Committee on Environment and Public Works. *Water Infrastructure Financing Act*. Report to accompany S. 2550. October7, 2004. 116 p. (S.Rept. 108-386)

FOR ADDITIONAL READING

U.S. Congress. Congressional Budget Office. *Future Investment in Drinking Water and Wastewater Infrastructure*. November 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.

U.S. Environmental Protection Agency. *Providing Safe Drinking Water in America: 2002 National Public Water Systems Compliance Report.* Report No. EPA 305-R-04-001. December 2004. 96 p.

U.S. Government Accountability Office. *Perchlorate: A System to Track Sampling and Cleanup Results Is Needed.* GAO-05-462. May 2005. 74 p.

National Research Council. *Health Implications of Perchlorate Ingestion.* Board on Environmental Studies and Toxicology. National Academies Press. January 2005. 177 p.