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Safeguarding the Nation's Drinking Water: EPA and Congressional Actions

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Summary

The events of September 11, 2001, focused heightened attention on the security status of the nation's drinking water supplies and the vulnerability of this critical infrastructure sector to attack. Congress since has enacted security requirements for public water systems and has provided funding for vulnerability assessments, emergency planning, and drinking water research. The Environmental Protection Agency (EPA), the lead federal agency for the water sector, has worked with water utilities, state and local governments, and federal agencies to improve the drinking water security.

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (P.L. 107-188) amended the Safe Drinking Water Act to require some 8,400 community water systems to assess vulnerabilities and prepare emergency response plans. It authorized funding for these activities and for emergency grants to states and utilities, and it directed the EPA to review methods to prevent, detect, and respond to threats to water safety and infrastructure security. The act did not require water systems to make security upgrades to address potential vulnerabilities. Since FY2002, Congress has appropriated funds annually for the EPA to work with states and the water sector to improve the security of drinking water supplies.

In the Homeland Security Act of 2002 (P.L. 107-296), Congress created a Department of Homeland Security (DHS) and gave the DHS responsibility for assessing and protecting the nation's critical infrastructures. However, the act did not transfer the EPA's water security functions, and the 2003 Homeland Security Presidential Directive (HSPD-7) confirmed the EPA's lead role in protecting the water infrastructure. Under this directive, the EPA has responsibility for developing and providing tools and training on improving security to roughly 53,000 community water systems and 16,000 municipal wastewater treatment facilities.

In the 109th Congress, several bills, including a reported bill, S. 2145, proposed to expand water security requirements for certain high-risk water systems. The Department of Homeland Security FY2007 appropriations act (P.L. 109-295, H.R. 5441) authorized the DHS to regulate for three years high-risk chemical facilities, but the law excluded from coverage drinking water and wastewater treatment facilities.

Although the EPA, states, localities, and water utilities have taken steps to address security concerns, the security of the nation's water supplies continues to attract congressional attention. Issues receiving attention have included the status of efforts by the water sector to improve security, whether to increase federal requirements, funding needs for water systems to make security improvements, the relative roles and responsibilities of the EPA and the DHS regarding the water sector, and the status of research and development of technologies to help water systems detect and address potential biological and chemical contaminants. This report reviews governmental and water utility efforts to improve drinking water security.

Contents

Background 1
EPA Efforts To Increase Drinking Water Security 2
Information Sharing and Analysis 3
Tools and Technical Assistance 3
Research 4
Funding for Drinking Water Security Activities 6
Legislation Enacted To Address Drinking Water Security 9
Bioterrorism Act of 2002 9
Homeland Security Act of 2002 10
Issues for Congress 11
Water Facility Security 12
Research 14
EPA and DHS Water Infrastructure Security Roles 15

List of Tables

Table 1. Community Water System Requirements under the Bioterrorism Act 10

Safeguarding the Nation's Drinking Water: EPA and Congressional Actions

Background

Ensuring the security of the nations' drinking water supplies poses a substantial challenge, partly because the number of water systems is very large and also because the responsibility for protecting drinking water safety is shared among federal, state and local governments and utilities. Nationwide, there are more than 158,000 public water systems, and these systems range greatly in size, serving from as few as 25 persons to more than 1 million persons. Nearly 53,000 of all public water systems are community water systems (CWSs) that serve the same residences year-round.[1] These 53,000 systems provide water to approximately 282 million people. Approximately 400 community systems serve more than 100,000 people and provide water to nearly half of the total population served. Because water supplies support many uses (from drinking water to fire suppression), their disruption could have significant impacts.[2]

A 1996 executive order on critical infrastructure protection (E. O. 13010), included water supply systems as one of eight national infrastructures vital to the security of the United States.[3] In 1997, the President's Commission on Critical Infrastructure Protection, created by the executive order, issued a report on the vulnerabilities of these infrastructure sectors and strategies for protecting them. The Commission identified three attributes crucial to water supply users: water must be available on demand, it must be delivered at sufficient pressure, and it must be safe for use.[4] Actions affecting any of these factors could be debilitating for the infrastructure.

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[1] Another 19,174 public water systems are non-transient, non-community water systems (NTNCWS), such as schools or factories, that have their own water supply and generally serve the same individuals for more than six months but not year-round. More than 86,200 other public water systems are transient non-community water systems (TNCWS), such as campgrounds and gas stations, that provide their own water to transitory customers.

[2] For a broader review of security issues in the water resources sector (including dams and sewage treatment plants), see CRS Report RL32189, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland.

[3] For a review of critical infrastructures, related security issues and protection initiatives, and activities within the Department of Homeland Security, see CRS Report RL30153, *Critical Infrastructures: Background, Policy, and Implementation*, by John D. Moteff.

[4] The President's Commission on Critical Infrastructure Protection, *Critical Foundations: Protecting America's Infrastructures. Report of the President's Commission on Critical Infrastructure Protection*, Appendix A, Sector Summary Reports, Oct. 1997, p. A-45.

Major threats to water supplies include physical destruction of facilities or distribution systems, biological or chemical contamination of supplies, and cyber attacks. The 1997 Commission found that drinking water systems had inadequate protection against the threat of chemical or biological contamination, and that technology was insufficient to allow detection, identification, measurement, and treatment of highly toxic, waterborne contaminants. Water utilities were also found to be vulnerable to cyber attacks as they rely increasingly on computers to control water flow and pressure. Information sharing was identified as the most immediate need, whereas warning and analytical capabilities and research and development all were found to be insufficient.

In response to these findings and related developments, President Clinton, in 1998, issued Presidential Decision Directive (PDD) 63 on critical infrastructure protection. Under this directive, a public/private partnership was established to put in place prevention, response, and recovery measures to ensure the security of the nation's critical infrastructures against criminal or terrorist attacks. PDD-63 designated the Environmental Protection Agency (EPA) as the lead federal agency for the water supply sector, and the EPA appointed the Association of Metropolitan Water Agencies (AMWA) to coordinate the water sector. However, before September 11, 2001, the main focus of PDD-63 efforts for all critical infrastructure sectors was on cybersecurity. Subsequently, the breadth and depth of efforts to protect the nation's critical infrastructures has changed significantly.

EPA Efforts To Increase Drinking Water Security

In 2003, President Bush issued Homeland Security Presidential Directive 7 (HPSD-7), which affirmed the EPA as the lead federal agency for coordinating the protection of the nation's critical infrastructure for the water sector. Under this directive, the EPA is responsible for developing and providing tools and training on improving security to roughly 53,000 community water systems and 16,000 municipal wastewater treatment facilities.

To carry out its water sector responsibilities, the EPA established a Water Security Division within the Office of Ground Water and Drinking Water. This Division works with drinking water and wastewater utilities, states, tribes, and other stakeholders to improve the security of these utilities and improve their ability to respond to security threats and breaches. Among its responsibilities and activities, the Water Security Division provides security and antiterrorism-related technical assistance and training to the water sector. Although the Water Security Division was established in 2003, the Office of Water has provided assistance to its stakeholders for a number of years.

Security-related activities undertaken by the EPA and the water sector have fallen into five general categories, including (1) establishing an information center for drinking water alerts or incidents, (2) developing vulnerability assessment tools, (3) identifying actions to minimize vulnerabilities, (4) revising emergency operations plans, and (5) supporting research on biological and chemical contaminants considered to be potential weapons of mass destruction. Several key government and private sector efforts are reviewed below.

Information Sharing and Analysis. One goal of PDD-63 in 1998 was to establish an Information Sharing and Analysis Center (ISAC) for each critical infrastructure sector. With assistance from the EPA and the Federal Bureau of Investigation (FBI), the Association of Metropolitan Water Agencies has led the effort to develop and implement an ISAC for water utilities. The Water ISAC provides a communications link between the water sector and federal homeland security, law enforcement, intelligence, environmental, and public health agencies. This secure, web-based communication system is intended to disseminate information regarding threats against the physical and cyber systems of drinking water and wastewater facilities, allow drinking water and wastewater utilities to share information on security incidents, and provide an opportunity for utilities to have security incidents analyzed by counterterrorism experts.[5]

Tools and Technical Assistance. The EPA has worked with its water sector partners to provide practical tools and technical assistance to utilities on a wide range of security matters. In 2000, the American Water Works Association Research Foundation (AWWARF) and the Sandia National Laboratories, with EPA support, initiated a project to develop a methodology for utilities to use to assess their vulnerabilities and develop plans to minimize identified risks. The project was expedited after September 11, 2001, and completed in November 2001, and many large water systems used this risk assessment methodology to conduct vulnerability assessments. States and drinking water organizations, in collaboration with the EPA, developed additional vulnerability assessment tools, with a particular focus on the needs of smaller communities. To help cover the costs of conducting vulnerability assessments and preparing emergency response plans, the EPA awarded a total of $51 million in grants to community water systems that serve more than 100,000 persons.

While direct grants have not been available for smaller water systems, a considerable amount of technical assistance has been aimed at helping these systems, which typically are least likely to have the capacity to address security concerns. The EPA has used "train-the-trainer"grants to build a pool of environmental professionals that has provided training and technical assistance to water systems serving fewer than 50,000 people.[6] In addition, on-site assistance for vulnerability assessment and emergency response planning has been made available to small and medium wastewater utilities at no cost through the Wastewater Operator Training Program.

Technical assistance also has been provided through numerous guidance documents designed to help public water suppliers address a range of security concerns.[7] A key product is the *Response Protocol Toolbox: Planning for and*

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[5] For further information on the Water ISAC, see [http://www.waterisac.org].

[6] The EPA generally does not perform security training; rather, the agency has delivered training at locations across the country through stakeholder organizations and other federal partners. Organizations that provide training include professional associations, such as the American Water Works Association, the Water Environment Federation, and the National Rural Water Association. Congress has provided some grant funds to these organizations, through the EPA, to support their water security training activities.

[7] Water security reports, guidance documents, security directives, and other publications are (continued...)

Responding to Contamination Threats to Drinking Water Systems, which is intended to help public water systems respond to contamination threats and incidents. The "toolbox" includes separate modules that address water utility planning, contamination threat management, site characterization and investigation, water sample analysis, public heath response, and remediation and recovery.[8] Paralleling the toolbox, the EPA developed response guidelines to help water utilities, emergency responders, and other officials during the management of an ongoing contamination threat or incident.

As a sector, drinking water utilities acted relatively quickly to assess vulnerabilities, upgrade emergency response plans, and take some initial steps to improve security of this critical infrastructure. The Office of Homeland Security's 2003 *National Strategy for the Physical Protection of Critical Infrastructure and Key Assets* reported that the water sector had taken great strides to protect its critical facilities and systems, and had focused on categories of possible attacks that could have the greatest health or economic consequences.[9] However, the Homeland Security Office noted that the water sector needed better threat information to prioritize investments on security measures. It also reiterated the need for research and development of new monitoring and analytic capabilities to enhance detection of biological, chemical, and radiological contaminants that could be introduced to the water supply.

Research. The EPA has participated in various research and development projects related to water security, including research to evaluate the ability of drinking water treatment systems to remove and inactivate biological and chemical agents. The agency also has supported research efforts to determine the fate and transport of contaminants within rivers and streams and within water treatment plants and distribution systems, and to develop biodetectors for detecting and quantifying biological contaminants in drinking water supplies.

To coordinate and oversee research involving the prevention and response to terrorist attacks, the EPA's Office of Research and Development established the National Homeland Security Research Center (NHSRC) in 2002. The Center's key areas of research involve water infrastructure protection, decontamination and consequence management, and threat and consequence assessment.

In 2004, the NHSRC's Water Infrastructure Protection Division and the Office of Water's Water Security Division developed a Water Security Research and

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[7] (...continued)
available at [http://cfpub.epa.gov/safewater/watersecurity/publications.cfm].

[8] U.S. Environmental Protection Agency, *Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents*, August 2004. Available at [http://www.epa.gov/watersecurity/pubs/rptb_response_guidelines.pdf].

[9] Office of Homeland Security, *The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets*, February 2003, p. 39. The categories included (1) physical damage or destruction of critical assets (including the intentional release of toxic chemicals), (2) actual or threatened contamination of the water supply, (3) cyber attack, and (4) interruption of services from another infrastructure (such as energy supply).

Technical Support Action Plan to define a specific program of research and technical support for protecting drinking water and wastewater facilities from terrorist threats and attacks. The action plan, which was reviewed by the National Research Council (NRC), addressed drinking water supply, water treatment, finished water storage, and distribution systems. It identified major research needs in the following areas:

- protecting physical and cyber infrastructure;
- identifying drinking water contaminants;
- improving monitoring systems and analytical methods for drinking water;
- containing, treating, decontaminating, and disposing of contaminated water and material;
- contingency planning;
- addressing infrastructure interdependencies;
- risk assessment and communication; and
- protecting wastewater treatment and collection systems.[10]

A key concern the NRC expressed regarding the action plan was that it did not discuss the financial resources that would be required to complete the proposed projects and to implement countermeasures needed to improve water security. The NRC recommended that EPA try to quantify the costs and benefits associated with the research and technical support projects. The NRC further noted that more emphasis was needed on communicating the value of water and increased security, because water rate increases would likely be needed to generate the resources needed to implement counter measures.[11]

In a 2005 progress report on the action plan, the EPA reported that more than 100 projects had been initiated to address the needs listed in the plan.[12] Projects currently underway include a review of early warning systems, a tracer studies guide for use by water utilities, a treatability guide for biological contaminants in water, a review of emerging detection technologies for water contaminants, a review of the impacts of biological toxins on water systems, devices to concentrate and analyze water for contaminants, and performance verifications of the effectiveness of monitoring, treatment, and decontamination technologies. The Water Infrastructure Protection Division has lead responsibility for much of this research and is producing tools, guides, and other products for use by water utility operators, public health officials, and emergency responders.

For FY2006 and FY2007, the EPA requested funding for the WaterSentinel Initiative, a demonstration project to develop a model contamination warning system for drinking water systems. The goal of this initiative is to establish pilot early

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[10] U.S. Environmental Protection Agency, *EPA's Role In Water Security Research: The Water Security Research and Technical Support Action Plan*, EPA/600/R-04/063, March 2004.

[11] National Academy of Sciences, *A Review of the EPA Water Security Research and Technical Support Action Plan: Parts I and II*, National Academy Press, 2003.

[12] U.S. Environmental Protection Agency, *Water Security Research and Technical Support Action Plan — Progress Report for 2005*, p. 5-7.

warning systems through intensive water monitoring and surveillance in selected cities. As noted below, the 109th Congress gave partial support to this initiative. Using the resources appropriated, the EPA has established an initial pilot for this water security initiative, and expects to publish interim guidance during 2007.

Funding for Drinking Water Security Activities

Since 2001, Congress has provided funds annually to the EPA to improve the security of public water supplies. The *Emergency Supplemental Appropriations Act for FY2002* (P.L. 107-117) provided the EPA with $175.6 million for emergency expenses to respond to the September 11 attacks and to support counterterrorism activities. The accompanying conference report, H.Rept. 107-350, specified that approximately $90 million was for improving security at EPA laboratories, performing drinking water vulnerability assessments, and anthrax decontamination activities. Another $5 million was for state grants for counterterrorism coordinators to work with the EPA and water utilities in assessing drinking water safety. Congress has continued to provide roughly $5 million for these state grants each year.

During **FY2002**, the EPA allocated roughly $89 million of the amount provided in the emergency supplemental appropriation to support security enhancements at the nation's drinking water systems. Of this amount, the EPA targeted approximately $80 million to: (1) provide grants to the largest drinking water systems to conduct vulnerability assessments and enhance emergency response plans; (2) provide technical assistance on vulnerability assessments and emergency response plans to small and medium drinking water systems; and (3) refine security-related detection, monitoring, and treatment tools. Another $4 million was used to accelerate the development and testing of counterterrorism tools, support vulnerability assessment training, provide technical assistance, and conduct and implement research on redesign and detection for collection and treatment systems. The EPA also used funds to develop tools and provide training for medium and small drinking water systems to assess vulnerabilities and develop emergency response plans. In addition, the EPA allocated $5 million to the states to support homeland security coordination work involving the EPA and drinking water utilities.

The EPA awarded approximately $51 million in water security grants to the community water systems that serve more than 100,000 individuals. Grants were made to these roughly 400 publicly and privately owned community water systems for as much as $115,000 per grant. Utilities were able to use their grants to develop vulnerability assessments, emergency response plans, and security enhancement plans and designs. Utilities also could use grant funds for in-house or contractor support; however, funds could not be used for physical improvements.

Although these grants were made only to large systems, the EPA has worked with states and utilities to help meet the security needs of small and medium-sized drinking water systems. The EPA provided roughly $20 million of FY2002 supplemental funds directly to the states for technical assistance and training for drinking water systems serving fewer than 100,000 people.

For **FY2003**, the EPA requested $16.9 million to assist small and medium-sized systems with vulnerability assessments and emergency response plans, and $5 million

in grants to states to support homeland security coordination. The Consolidated Appropriations Resolution for FY2003 (P.L. 108-7), provided this amount. It also contained several drinking water security earmarks, including $2 million for the National Rural Water Association to help small water systems conduct vulnerability assessments and $1 million for the American Water Works Association for water security training activities.

As requested for **FY2004**, the EPA received approximately $32 million for critical water infrastructure protection, including $5 million for state homeland security grants in P.L. 108-199. 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. The 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. P.L. 108-199 also included $2 million for the Water ISAC to gather, analyze and disseminate sensitive security information to water and wastewater systems.

For **FY2005**, the EPA requested $5 million for state water security 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. (Under the Bioterrorism Act, community water systems were required to complete vulnerability assessments by June 30, 2004.) Congress provided the requested amount in the Consolidated Appropriations Act, FY2005 (P.L. 108-447). As in FY2004, the appropriated amount included $2 million for the Water ISAC.

In the **FY2006** budget request, the President again requested $5 million for state water security grants. The President also requested $44 million to launch the WaterSentinel Initiative, a demonstration project to develop a model contamination warning system. The EPA initiated this project to meet its responsibilities under Homeland Security Presidential Directive (HSPD) 9, which directed the EPA to develop a surveillance and monitoring program to provide early detection in the event of a terrorist attack contaminating water. The goal of the initiative is to establish pilot early warning systems through intensive water monitoring and surveillance for certain chemical and biological contaminants in five cities. Further responding to HSPD-9, the EPA proposed to form a laboratory network to support the monitoring and response requirements of the surveillance program.[13]

In EPA's FY2006 appropriations act (P.L. 109-54), Congress provided $8.1 million (after rescissions) of the $44 million requested for the WaterSentinel Initiative. In recommending a large reduction, the House Appropriations Committee recommended that the EPA develop clear goals for the initiative, seek the advice of the Science Advisory Board, and justify the request more clearly in the budget request

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[13] U.S. Environmental Protection Agency, *FY2006 Annual Performance Plan and Congressional Justification*, Science and Technology, Homeland Security: Critical Infrastructure Protection, pp. S&T-21 - S&T-23.

for FY2007.[14] Congress also provided $5 million ($4.93 after rescissions) for state water security grants.

The **FY2007** budget request included $4.95 million for state water security grants. In addition, the request again included a significant amount, $41.7 million, for the WaterSentinel Initiative ($33.6 million more than Congress provided for FY2006). In its justification for the request, the agency noted that the program is an essential component of its water security activities, and explained that its purpose is to demonstrate an effective contamination warning system that could be used by drinking water utilities of various sizes.

The EPA FY2007 funding bill, H.R. 5386, as passed by the House, would have provided $16.7 million, or $25 million less than requested for the WaterSentinel Program. The Senate Appropriations Committee (S.Rept. 109-275) recommended $18.13 million, which was $23.6 million less than requested but $10 million above the FY2006 enacted level. The House Appropriations Committee report for H.R. 5386 (H.Rept. 109-465) stated that the committee's recommended funding level for the initiative included money for one additional pilot project, which should be located in a metropolitan area that is highly vulnerable from a homeland security threat perspective. The committee further recommended that

> [a]ny future WaterSentinel funding should be requested through the Department of Homeland Security and EPA should coordinate with the Office of Management and Budget to ensure this happens beginning in fiscal year 2008. While the Committee agrees that EPA's expertise is important for program success and that it had a critical role to play in establishing the program, the Committee also believes strongly that continuing program funding must be provided through the Department of Homeland Security.[15]

Congress did not complete action on this appropriations bill. The revised continuing appropriations resolution for FY2007 (P.L. 110-5, H.J.Res. 20) generally funded EPA activities, including drinking water activities, at FY2006 levels.

For **FY2008**, the EPA has requested $25.6 million to support its water security initiative pilot program (formerly known as WaterSentinel) and other water sector agency responsibilities to protect critical water infrastructure. The EPA proposes to use the requested funding for FY2008 to support the existing pilot and the establishment of additional pilots, with a goal of having all planned pilots underway by 2008. The EPA also plans to continue to provide special assistance to high-priority drinking water systems under the Water Alliance for Threat Reduction. The goal of this assistance is to ensure that water utilities have tools and information to prevent, detect, respond to, and recover from terrorist attacks, other intentional acts, and natural disasters.

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[14] U.S. Congress, House Committee on Appropriations, *Department of the Interior, Environment, and Related Agencies Appropriation Bill, 2006*, report to accompany H.R. 2361, 109th Cong., 1st sess., H.Rept. 109-80, p. 94.

[15] U.S. Congress, House Committee on Appropriations, *Department of the Interior, Environment, and Related Agencies Appropriation Bill, 2007*, report to accompany H.R. 5386, 109th Cong., 2nd sess., H.Rept. 109-465, p. 100-101.

Thus far, Congress has not provided funding in EPA appropriations for grants to public water systems specifically for making security improvements. However, the EPA has identified numerous security measures that are eligible for funding through the Drinking Water State Revolving Fund (DWSRF) program.[16] Eligible measures include making facility improvements, such as adding fencing, cameras, and lighting; securing chemical and fuel storage; hiring guards; and adopting enhanced filtration and disinfection treatment. Congress has provided approximately $845 million annually for this program in recent years. However, it is uncertain how readily funds might become available for security measures, as the key purpose of the DWSRF is to facilitate compliance with federal drinking water regulations, and competition for these funds can be considerable.

Another potential source of funding for community water systems is the State Homeland Security Grant Program, administered by the Department of Homeland Security. This program provides assistance to states to detect, prevent, and respond to terrorist attacks. States are required to allocate 80% of the grant funds received under this program to localities, in accordance with their approved homeland security plans. Funds may be used for homeland security related training and for protecting critical infrastructure, including making physical security improvements. Local public works agencies, including water districts, are eligible to receive funding from the state; however, most of these funds have been used to support first responders.[17]

Legislation Enacted To Address Drinking Water Security

Since 2001, two key pieces of legislation have been enacted that address the security of drinking water supplies and infrastructure: the Bioterrorism Act of 2002, and the Homeland Security Act of 2002.

Bioterrorism Act of 2002. The *Public Health Security and Bioterrorism Preparedness and Response Act of 2002* (P.L. 107-188) was enacted in June 2002. Title IV of the act (42 U.S.C. 300i) amended the Safe Drinking Water Act (SDWA) to require community water systems serving more than 3,300 individuals to conduct an assessment of their system's vulnerability to terrorist attacks or other intentional acts to disrupt the provision of a safe and reliable drinking water supply. These water systems were required to certify that they had conducted a vulnerability assessment and to submit a copy of the assessment to the EPA. The act also required the water utilities to prepare or revise emergency response plans incorporating the results of the vulnerability assessments no later than six months after completing them. (**Table 1** outlines the schedule for the nearly 8,400 water systems that were required to submit vulnerability assessments to the EPA and complete emergency response plans.) As required, the EPA issued guidance on conducting vulnerability assessments,

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[16] See EPA Fact Sheet, *Use of the Drinking Water State Revolving Fund (DWSRF) to Implement Security Measures at Public Water Systems*, EPA 816-F-02-040, November 2001. Available at [http://www.epa.gov/safewater/dwsrf/security-fs.pdf].

[17] For information on DHS grant programs and funding allocations, see CRS Report RL33770, *Department of Homeland Security Grants to State and Local Governments: FY2003 to FY2006*, by Steven Maguire and Shawn Reese.

preparing emergency response plans, and addressing threats to assist smaller water systems that were not covered by the Bioterrorism Act.[18]

The act exempted the contents of the vulnerability assessments from disclosure under the Freedom of Information Act (except for information contained in the certification that identified the system and the date of the certification). As required by the Bioterrorism Act, the EPA developed protocols to protect the vulnerability assessments from unauthorized disclosure. The act provides for civil and criminal penalties for inappropriate disclosure of information by government officials.

The Bioterrorism Act authorized $160 million for FY2002, and such sums as may be necessary for FY2003-FY2005, to provide financial assistance to community water systems to conduct vulnerability assessments, to prepare response plans, and for expenses and contracts to address basic security enhancements and significant threats. (Security enhancements may include purchase and installation of intruder detection equipment and lighting, enhancing security of automated systems, personnel training and security screening of employees or contractors, etc. Funding may not be used for personnel costs, plant operations, monitoring or maintenance.)

Table 1. Community Water System Requirements under the Bioterrorism Act

System size by population served (est. no. of systems)	Date for completing vulnerability assessments	Date for completing emergency response plans
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

For grants to states and water systems to assist in responding to emergency situations, the act authorized $35 million for FY2002, and such sums as may be necessary thereafter. Finally, the act authorized $15 million for FY2002, and such sums as may be necessary for FY2003 through FY2005, for the EPA to review methods by which terrorists or others could disrupt the provision of safe water supplies, and methods for preventing, detecting, and responding to such disruptions.

Homeland Security Act of 2002. The *Homeland Security Act of 2002* (P.L. 107-296) combined the functions of all or parts of 22 federal agencies and departments into a new Department of Homeland Security (DHS). The act gave key

[18] EPA published *Water Security Strategy for Systems Serving Populations Less than 100,000/15MGD or Less* (July 2002).

responsibility for critical infrastructure protection to the DHS, but did not transfer EPA water security functions to the new Department.

The Homeland Security Act established within the DHS a Directorate for Information Analysis and Infrastructure Protection (IA/IP), headed by an undersecretary. In 2005, Homeland Security Secretary Chertoff undertook a major restructuring of the department that included reorganizing the IA/IP Directorate and separating information analysis and infrastructure protection. The IA/IP Directorate was renamed the Directorate of Preparedness, and the IA function was moved to a new Office of Intelligence and Analysis.[19]

With the establishment of the Department of Homeland Security, which has overall responsibility for critical infrastructure vulnerability assessment and protection, the relative roles and responsibilities of the EPA and the DHS were not clear. In late 2003, the White House issued Homeland Security Presidential Directive (HSPD-7), which superseded PDD-63. This Directive established national policy and outlined the roles and responsibilities of federal departments and agencies regarding critical infrastructure protection. It identified the EPA as the federal agency with lead responsibilities for ensuring the protection of the water infrastructure sector from terrorist attacks or sabotage. Under HSPD-7, the DHS is responsible for overall coordination and integration of national critical infrastructure protection efforts by federal, state, and local governments and the private sector, whereas the EPA is responsible for developing and providing water security tools and training for the nation's community water systems and municipal wastewater treatment facilities.

HSPD-9 provided some additional articulation of EPA's role. This directive instructed the EPA to develop a comprehensive surveillance and monitoring program to provide early detection of contaminants in water systems. HSPD-9 further directed the EPA to develop an integrated network of water quality laboratories to support the surveillance program.

Issues for Congress

The 109th Congress considered a variety of bills regarding the security of public water supplies, but legislation was not enacted. Some interest focused on implementation of the drinking water security provisions of the Bioterrorism Preparedness Act. S. 1426, for example, would have reauthorized appropriations for SDWA section 1434 (addressing contaminant prevention, detection, and response), and would have required the EPA to report to Congress on progress and problems encountered in implementing these provisions.

An ongoing issue concerns the status and adequacy of public and private efforts to improve the security of public water systems. Because of actions on the part of drinking water utilities, the EPA, and Congress, vulnerability assessment and planning efforts in the water sector appear to be ahead of those in certain other sectors

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[19] For further discussion, see CRS Report RL33369, *Federal Emergency Management and Homeland Security Organization: Historical Developments and Legislative Options*, by Henry Hogue and Keith Bea.

(such as chemical facilities); however, it is unclear how much has been done within the sector to invest in security upgrades. Although the Bioterrorism Preparedness Act required community water systems to conduct vulnerability assessment and prepare emergency response plans, it did not require systems to make security upgrades to address any identified vulnerabilities.[20]

Water Facility Security. The issue that received most attention in the past Congress involved the security of chemical facilities, including certain water utilities, that are located where a terrorist attack could cause harm to nearby populations. A key concern is the onsite storage of hazardous, gaseous chemicals (such as chlorine) that pose potential risks to local communities if released.

Several bills in the 109th Congress targeted such high-consequence facilities within the water sector. S. 2855 proposed to amend SDWA to require community water systems to replace hazardous, gaseous chemicals with inherently safer technologies (for example, switching from the use of chlorine gas to liquid chlorine). S. 2855 also would have required the EPA to provide grants to high-consequence facilities for use in paying capital expenditures needed to make the transition to the use of inherently safer technologies (IST). S. 2781 and S. 1995 proposed to amend the Clean Water Act to address security at wastewater treatment facilities. The Senate Committee on Environment and Public Works reported a wastewater treatment facilities bill, S. 2781 (S.Rept. 109-345), which did not contain IST requirements.[21]

Broader chemical facility security bills also were offered that had implications for water utilities. These bills generally would have authorized the Secretary of the Department of Homeland Security to regulate chemical facilities, including water treatment plants, that pose certain risks. S. 2145, as reported by the Senate Homeland Security and Governmental Affairs Committee (S.Rept. 109-332), and its companion bill, H.R. 4999, would have directed the Secretary of DHS to issue rules designating which chemical facilities would be subject to regulation, and establish security performance standards such facilities. Under these bills, facilities would have been required to submit to the DHS vulnerability assessments, security plans, and emergency response plans for terrorist incidents. H.R. 5695 (H.Rept. 109-707) shared several similarities with S. 2145 but would have exempted water facilities covered by the legislation from redundant requirements (such as conducting vulnerability assessments), unless the DHS determined that more stringent security requirements were needed. S. 2486 proposed to cover a wider range of facilities and

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[20] SDWA §1433(b) states that emergency response plans "shall include, but not be limited to, plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack on the public water system. The emergency response plan shall also include actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals." (42 U.S.C. 300i-2)

[21] For a detailed discussion of chemical facility legislation and issues, see CRS Report RL31530, *Chemical Facility Security*, by Linda-Jo Schierow, and CRS Report RL33043, *Legislative Approaches to Chemical Facility Security*, by Dana A. Shea.

establish a general duty to ensure that facilities would be designed, operated, and maintained in safe manner; the bill defined this obligation to include use of inherently safer technology to the maximum extent practicable. H.R. 1562 would have required consultation between the DHS and the EPA, and would have imposed stronger security and emergency planning measures, rather than requiring changes in technology. H.R. 2237 would have expanded the EPA's existing authority to oversee chemical facilities but would require consultation with the DHS.

Several local government and water organizations, including the American Water Works Association (AWWA), sought exemptions from S. 2145 and other bills that proposed to give the DHS authority to regulate water utilities that use hazardous chemicals (such as chlorine gas). These stakeholders argued that the EPA already has an established water security program and has been designated the lead agency for water infrastructure security. In general, the AWWA has opposed legislation that would require water utilities to switch treatment processes without considering specific utility circumstances and local water and climate characteristics. Others have argued that mandating the adoption of safer technologies is warranted because of the potential risk that hazardous chemicals, particularly gaseous chlorine, may pose to communities.

The 109th Congress included a chemical facility security provision in the DHS FY2007 appropriations bill (P.L. 109-295, H.R. 5441). The provision authorized the department to regulate, for three years, high-risk chemical facilities, *excluding* drinking water and wastewater treatment facilities and facilities in ports. The DHS is required to establish risk-based security performance standards for designated chemical facilities, and to require these facilities to prepare vulnerability assessments and security plans. Because of the scope of this provision and related implementation issues, chemical facility security remains an issue in the 110th Congress.[22]

Assistance for Security Measures. Also at issue is the availability of funding for water systems to make security upgrades needed to address risks identified in their vulnerability assessments. Based on a limited assessment, the EPA estimated that community water systems will need more than $1 billion to make security improvements.[23] The AWWA has estimated that municipal water systems would have to spend more than $1.6 billion just to ensure control of access to critical water system assets.[24] Congress has not provided funding specifically for this

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[22] See CRS Report RL33847, *Chemical Facility Security: Regulation and Issues for Congress*, by Dana A. Shay and Todd B. Tatelman.

[23] U.S. Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment: Third Report to Congress*, June 2005. EPA 816-R-05-001. The EPA noted that many water systems had not adequately captured security needs when this assessment was conducted in 2003. The agency anticipates that security needs will be reported more completely in the next assessment.

[24] American Water Works Association, *Protecting Our Water: Drinking Water Security in American After 9/11*,Executive summary, 2003.

purpose.[25] Although community water systems potentially are eligible to receive funding from the states through the DHS State Homeland Security Grant Program, competition for funds is severe, and most funds have gone to meet the needs of first responders. In an effort to address one element of this concern, the conference report for the Department of Homeland Security Appropriations Act for FY2005 (P.L. 108-334, H.Rept. 108-774) modified the definition of "local unit of government" specifically to include water districts.[26]

The related question of how to set priorities for allocating homeland security funding has been debated for several years. At a House Energy and Commerce Committee hearing on bioterrorism and the security of water supplies, the Government Accountability Office (GAO) testified that water security experts widely agreed that decisions for allocating federal funding for water security improvements should be based primarily on two criteria: (1) population density, and (2) information from vulnerability assessments.[27] Security experts also set funding priorities at the utility level, and identified distribution systems as the most vulnerable component of a water system. Other water system components identified as requiring protective measures included utility computer systems, chemicals stored on-site, and source water supplies.[28]

Research. A major concern for the water sector has been the need for more research to develop real-time monitoring methods to detect contaminants, and technologies to remove or inactivate them. The water industry and security experts have identified a particular need for research to develop monitoring technologies that can quickly detect contaminants in water that has already left a treatment plant for distribution to consumers.

The EPA has focused homeland security research on the detection, containment, and decontamination of chemical and biological agents that could be used in attacks on water systems. These efforts received limited support during the 109th Congress. For FY2006, the EPA had requested $44 million for the WaterSentinel program to help address water utilities' concerns regarding their ability to detect and respond to chemical and biological contaminants.[29] The agency has considered this initiative to

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[25] As discussed on page 8 above, some security projects are eligible for funding under the EPA-administered drinking water SRF program.

[26] P.L. 108-334 included $1.1 billion for this grant program for FY2005. For information on DHS grant programs and allocation issues, see CRS Report RL33583, *Homeland Security Grants: Evolution of Program Guidance and Allocation Methods*, by Shawn Reese.

[27] U.S. Government Accountability Office, *Drinking Water: Experts' Views on How Future Federal Funding Can Best Be Spent to Improve Security*, Testimony before the Subcommittee on Environment and Hazardous Materials, Committee on Energy and Commerce, House of Representatives. Sept. 30, 2004. Testimony was based on report of same title to the Committee on Environment and Public Works, U.S. Senate, Oct. 2003, GAO-04-29.

[28] Ibid. pp. 2-3.

[29] U.S. Environmental Protection Agency, *FY2006 Annual Performance Plan and* (continued...)

be a key element of its effort to meet its water security responsibilities under HSPD-9. However, Congress provided just $8.1 million for the program in P.L. 109-54. In recommending a large reduction, the House Appropriations Committee commented that the EPA should develop clear goals for the WaterSentinel Initiative, and justify the request more clearly in the budget request for FY2007.[30]

The EPA's FY2007 request for the WaterSentinel Initiative again failed to receive the requested support. Specifically, House appropriators recommended that future WaterSentinel funding should be requested through the DHS and not the EPA. While agreeing that the EPA's expertise was important for program success and that it had a critical role to play, the House Appropriations Committee expressed its strong belief that future program funding must be provided through the DHS.[31] Action was not completed on the EPA funding bill, and EPA programs generally were funded at FY2006 levels under the continuing resolution for FY2007, P.L. 110-5, H.J.Res. 20.

EPA and DHS Water Infrastructure Security Roles. Although the Bioterrorism Act gave the EPA new authority and responsibilities to help water utilities and states enhance the security of drinking water supplies and facilities, the 108th and 109th Congresses expressed concern that, overall, the EPA's homeland security responsibilities had not been well articulated. In the conference report for the Consolidated Appropriations Act, 2005 (P.L. 108-447, H.Rept. 108- 792), conferees directed the EPA to enter into a comprehensive memorandum of understanding (MOU) with the DHS that defines the relationship and responsibilities of the two entities regarding homeland security and protection. Conferees specified that the MOU identify areas of responsibilities and the potential costs (including which entity pays) for meeting those responsibilities.[32] The EPA and the DHS have taken steps to clarify their roles and have entered into agreements to coordinate on specific activities, such as research. Perhaps unavoidably, some overlaps and conflicts have arisen. The congressional debate on chemical facility security bills and the House Appropriations Committee recommendations regarding FY2007 funding for EPA's water security initiative both suggest that the specific roles of these two agencies continue to be articulated and refined, both within the Administration and by the Congress.

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[29] (...continued)
Congressional Justification, Science and Technology, Homeland Security: Critical Infrastructure Protection, p. S&T-21 - S&T-23.

[30] U.S. Congress, House Committee on Appropriations, *Department of the Interior, Environment, and Related Agencies Appropriation Bill, 2006*, report to accompany H.R. 2361, 109th Cong., 1st sess., H.Rept. 109-80, p. 94.

[31] U.S. Congress, House Committee on Appropriations, *Department of the Interior, Environment, and Related Agencies Appropriation Bill, 2007*, report to accompany H.R. 5386, 109th Cong., 2nd sess., H.Rept. 109-465, p. 100-101.

[32] P.L. 108-447, *Consolidated Appropriations Act, 2005*, H.Rept. 108-792, conference report to accompany H.R. 4818, November 20, 2004, p. 1563.