

## Source Water 2000

### Drinking Water Protection Strategies for Small Towns and Rural Counties

#### I. How this guide will help

*Source Water 2000* is a companion to the 1997 *Action Guide for Source Water Funding*. The earlier *Action Guide* focuses on funding available through the federal 1996 Safe Drinking Water Act amendments (SDWA) to conduct source water assessments for all community drinking water systems. The assessment process, however, is just the first step in building a comprehensive program to protect and preserve local water supplies. The key steps in a comprehensive source water protection program define the land area that needs to be protected, identify actual or potential sources of contamination, manage those sources that may pose a risk and plan for the future. To help community leaders transform the assessment results into an effective protection program, *Source Water 2000* discusses:

- source water assessment procedures;
- the role that both local government and citizen groups play in water quality protection and funding initiatives; and
- the process through which a typical rural water system collects, treats and distributes drinking water.

The guide concludes with a summary of additional programs and strategies that will help increase public, private and community involvement in the planning and development of effective local source water protection efforts.

Source water protection is just one of many broader initiatives and new approaches for managing the environment. Sustainable development and preservation of open spaces are widely-practiced principles in land use planning. The administration's recent Clean Water Initiatives focus on control of nonpoint source pollution in both urban and rural settings and encourage a watershed-wide approach to identifying and controlling contaminant sources. Communities that undertake source water protection will find an ever-growing network of allies and resources committed to the same goals.

Note: Many readers may wonder if every governmental activity must have an acronym, or abbreviation. We use acronyms in this guide when the lengthy phrase or name is used repeatedly or if the term occurs widely in the regulatory or financing materials you are likely to use. Since some of the acronyms are similar, they are preceded by the full phrase or name at various points throughout the guide.

#### Source water at a glance

Source water protection has a straightforward objective: to prevent the pollution of the lakes, rivers, streams, and ground water that provide communities with their drinking water. Particularly in rural areas, ground water is an essential resource for public health, safety and economic growth. Half of all Americans and more than 95 percent of the country's rural population depend on underground sources for their household water supplies. Although the vast majority of the earth's surface is covered with water, the oceans and seas are salty. Only three percent is fresh— and two thirds of that is ice.

When water is fresh and plentiful, people settle and build communities. When water becomes scarce or contaminated, people leave. For years, the growing problem of “troubled waters” was undocumented or ignored. But passage of the Clean Water Act in 1972 marked the beginning of a concerted national effort to recognize and address water quality issues. Since then, the country has learned much about sources of pollution and how they may be controlled. Source water protection is part of the evolution in drinking water strategies. Wellhead protection for example, is an approach to source water protection that focuses on prevention of contamination around well sites. Management of the land surrounding a reservoir is an example of source water protection that focuses on a surface water supply

### **Benefits of source water protection**

Source water protection is the first line of defense in keeping water safe to drink. *Source Water 2000* describes the tools used to identify threats to community drinking water and informs small town and rural leaders about major resources to protect essential public water supplies. Recent federal legislation has given source water protection a higher profile, but it is not a new concept. Many communities are already taking important steps to control and eliminate water pollution.

Source water protection supports local drinking water programs in four significant areas:

- protecting public health;
- maintaining the confidence of your system's customers;
- saving your system money in future treatment and other federal and State compliance costs; and
- generating support for local rate increases when they become absolutely necessary.

. Source water protection programs deal with drinking water from both surface water and ground water sources and may cover more than one water source or one water system.

Unquestionably, communities are the key stakeholders in source water protection. It is people living and working in communities who have the most to gain or lose from the quality of their drinking water.

The value of investing in source water protection is perhaps best understood by calculating the cost of dealing with a contaminated water supply. Financial benefits can be divided into those that are easy to quantify and those that are not. Easily captured contamination costs include those associated with: water treatment; remediation of the contaminant source; location of new water supplies; purchasing bottled water; consulting services and staff time; litigation costs against responsible parties; and provision of public information to satisfy public and media concerns.

Communities with effective source water protection programs may realize substantial savings in the cost of complying with Safe Drinking Water Act regulations and federal monitoring requirements. Implementation of source water protection programs, for instance, could help water systems avoid costs related to compliance with the proposed Disinfection Byproducts Rule--cleaner source water simply requires less disinfection, thereby reducing the costs for removing disinfection byproducts. Water suppliers with source water protection programs in place may also be eligible for waivers from monitoring requirements that, in turn, would reduce monitoring costs. In Massachusetts, the State waiver program has saved local water systems approximately \$22 million over the 3-year compliance cycle, while a similar program in Texas has saved water systems \$49 million over two and one-half years.

Under the Surface Water Treatment Rule's filtration waiver program, huge savings are potentially available to surface water systems with good source water quality and an effective source water protection program. For example, 15 systems in Maine saved \$108 million in capital costs by not having to install filtration technology.

Towns should estimate the value of replacing current drinking water supplies, if current water sources become polluted. In areas of the country where demand exceeds supplies, the costs can be high. For example, Wichita, Kansas lost access to 2.5 billion gallons of ground water when the State decided not to pay for the removal of industrial solvents that far exceeded the levels allowed by federal drinking water standards.

Source water protection can provide benefits in economic terms through the maintenance of real estate values in areas served by protected water supplies. Communities without source water protection may risk the loss of actual or potential tax revenues and jobs because businesses relocate or refuse to establish operations near sites with known or suspected contamination problems.

The new SDWA source water protection provisions encourage programs to control and eliminate contaminants rather than simply removing them. The primary source of funding for these programs is the Drinking Water State Revolving Fund (DWSRF). Source water protection builds upon earlier initiatives, such as the prevention-based wellhead protection program (established by the 1986 Safe Drinking Water Act) and the Sole Source Aquifer program. What separates the source water program from past efforts, is the focus on surface, as well as ground water, the availability of some funding for state and local action and the strong public involvement component.

### **How many systems may benefit from the federal source water assessment program?**

There are nearly 200,000 public water systems in this country. They range in size from major urban utilities serving millions of people to simple wells serving a single trailer park. This total includes 58,000 community water systems (CWS) that provide water to about 80 percent of all public water consumers. The remaining 20 percent of the public water consumers receives its primary public water supply from non-community water systems.

Nationwide, there are 24,000 non-transient, non-community water systems (NTNCWS) that have their own ground or surface water sources and serve locations such as businesses and schools. In addition, there are 114,000 transient, non-community water systems (NCWS) with their own water supplies that serve the traveling public at camp grounds, motels, etc. Together, these three classes of systems make up the universe of public water systems (PWS) that must meet federal drinking water standards. All public water systems, including the 58,000 community water systems, are covered by the federal source water assessment requirements.

Not only are public water systems great in number, they are overwhelmingly small in size. Small community water systems (with less than 3,300 customers) serve only 11 percent of the population, but they make up some 87 percent of the total regulated systems. Primarily because of their size and limited resources, they have experienced the greatest number of regulatory problems. In its first national *Drinking Water Infrastructure Needs Survey*, released in January 1997, the U.S. Environmental Protection Agency estimates that small systems will need \$37 billion over the next

20 years just to satisfy existing regulations. The agency projects that the number of small systems having difficulty with compliance will only increase as federal monitoring, reporting and treatment regulations for new contaminants are phased in. These figures reinforce the importance of designing State source water assessment programs that meet the broadest range of water quality needs. When structured to address new regulatory requirements, source water protection efforts are likely to repay any current investment through future saving in monitoring, treatment and water supply costs.

### **What role do local leaders play in source water protection?**

In most States, small town elected leaders have three major responsibilities: the protection of public health and safety; the preservation of a community's economic and social framework; and the prudent expenditure of public funds. Source water protection will support local government efforts in all three areas.

There are few greater threat to public health than contaminated drinking water. Source water protection enables a community to control or eliminate contaminants before they enter the public water supply. Water may be rural America's most essential economic resource. Historically, a clean and reliable source of water has been the primary consideration in where people choose to live and work. In the rural economy, water is critical for agriculture, industry, recreation and tourism and sustainable growth. Source water protection enables community leaders to determine if current and planned economic activities threaten water quality and to calculate if future development may place excessive demands on current water supplies. Finally, source water protection may allow community water systems to realize substantial savings in meeting future regulations. References to potential cost savings for local water systems that develop source water protection programs appear throughout the guide.

Source water protection programs must develop over time. Some initial steps in the process have or will be taken because of federal legislation. Others, as the result of State initiatives. But most local drinking water protection programs will be successful because of concerted efforts by elected officials and other community leaders.

Over the next few years, community leaders and water system managers will receive basic information from the States on the presence of contaminants to which their systems may be vulnerable. The SDWA amendments require that States develop a program under which local drinking water assessments for public water systems must be conducted. Most States have decided to designate between eight and 10 percent of their 1997 Drinking Water State Revolving Fund (DWSRF) as a one-time set-aside to complete the required assessment program.

What happens after a State completes its assessment program?

- the State does have the option of setting aside a percentage of its DWSRF allocation for protection, as well as assessment, activities;
- federal legislation encourages, but does not mandate, that local protection programs be implemented or funded;
- funding levels for most new local drinking water initiatives will be determined each year on a discretionary basis by the State agencies to which EPA has delegated administrative responsibility; and

- local leaders will play the critical role in persuading State agencies to set aside funding to implement the recommendations developed from information provided in the assessments.

Virtually all the information in this guide is designed to help small town and rural decision-makers become aware of the opportunities to protect and preserve local water supplies and to become effective representatives in setting State funding priorities. Developing partnerships among State agencies, small town and county governments, community groups, and business and agricultural interests will be critical in targeting funds towards the greatest need and in selecting the most worthy projects.

At the federal level, source water protection is a new approach and will be implemented largely through voluntary, rather than mandatory, State-administered programs. Because the assessments for public drinking water systems may not be completed for three or more years, many local drinking water managers may wish to act sooner to provide some measure of protection. A number of the solutions recommended in this guide can be developed from information that is currently available and may be funded through programs that are listed in the resource section.

## II. The Source Water Assessment Program (SWAP)

Many local leaders regard the Source Water Assessment Program (SWAP) as the most important new drinking water provision in the 1996 Safe Drinking Water Act amendments. The legislation requires that each State establish a SWAP for all public drinking water systems and that the State submit a plan for its implementation to EPA by February 6, 1999. Local officials must remember, however, that the assessment conducted for your water system may point out problems, but it will not allocate resources for solutions.

The EPA guidance for State SWAP programs includes four components that we will examine in greater detail: the purpose and definition of a source water assessment; the criteria that determine the adequacy of assessment procedures selected by the States; the role and membership of the State citizen and technical advisory committees; and the broader issue of notification and participation of citizens in the State planning process. The summary material that follows is drawn primarily from the EPA's *State Source Water Assessment Protection Programs Guidance*, issued August 6, 1997 and the *State Source Water Assessment Program Review Protocols*, issued June 3, 1998. Both documents are available on the EPA web site for the Office of Ground Water and Drinking Water at <http://www.epa.gov/OGWDW/swp.html>

According to the guidance document that EPA issued for the States in August 1997, SWAP programs must:

- delineate source water protection areas;
- inventory significant contaminants in these areas; and
- determine the susceptibility of each public water supply to contamination.

Specifically, the guidance says States must:

- delineate the boundaries of the assessment areas, using "all reasonable available hydrologic information [and] water flow, recharge and discharge...information to adequately determine such areas;"
- "identify contaminants for which [federal] monitoring is required (or any unregulated contaminants...which the State...has determined may present a threat to public health);" and
- to the extent practical, identify, "the origins within each delineated area of such contaminants to determine the susceptibility of the public water systems in the delineated area to such contaminants."

While the language sounds technical, EPA clearly expects a great deal from the required State assessment program. When conducted properly, the assessment for an individual system should inform community leaders conclusively where their water source(s) are located and the major influences on their quality and quantity. In addition to water sources, the assessment will identify the location, or origin, of all federally regulated contaminants that are present, or may be present, in the assessment area in significant amounts or concentrations, even if these contaminants have not been detected in monitoring or test results. (Local leaders should note that the micro-organism, cryptosporidium, will be a regulated contaminant by the deadline for state SWAP submittals). Finally, the assessment will determine, within reasonable limits, the potential threat that these contaminants pose to the individual water system. At their discretion, States may provide the same information on additional contaminants that they consider potentially harmful, even though these contaminants are not subject to federal regulation. And animal feedlots and salt storage sheds, for example, may be identified in local assessments as potentially significant sources that may require containment efforts in the future.

States must describe how they will address these and other related local source water requirements in the plan they submit to EPA in February 1999. Following EPA approval of the plan, the State has up to two years, or with an approved extension, up to a maximum of three and one half years, to complete local source water assessments.

Many localities, with the help of existing federal and State programs, have some elements of an assessment program in place. For example, States that have EPA-approved Wellhead Protection Programs (WHPP) in place have essentially satisfied the SDWA requirements for assessing ground water-based drinking water supplies. The integration of SWAPs with wellhead protection programs, comprehensive State groundwater programs, as well as with watershed, non-point source, and agricultural runoff protection programs will help States and localities avoid costly contamination of water supplies.

Although not required by federal legislation, local prevention and protection efforts will be much easier to achieve:

--when community leaders know, as completely as possible, where all potential contaminants are located before they enter the water supply; and

--when water quality planners have a firm understanding of how great or how little a threat these contaminants pose.

Protection efforts are strongly encouraged both in the guidance language and in the flexibility that EPA has allowed in State set-aside programs. States, for example, may award part of their federal funding for community water systems to guard against either bacterial or chemical contamination. States may also set aside funding to provide loans for land acquisition and conservation easements to provide protected areas for local water sources.

Regardless of the pace at which a State implements its source water assessment program, much of how the SWAP in your State responds to local government and community needs will be determined by the level and enthusiasm of public participation.

### C. Public Participation

Public participation, along with forceful State leadership, are the two keys to implementing the preventive measures in the SDWA. States must convene Statewide citizen and technical advisory committees to receive public input when developing the State SWAP. To enhance State efforts and broaden the base for

decision-making, the federal SDWA directs States, "to the maximum extent possible, [to]...establish procedures, including...the establishment of technical and citizens advisory committees, to encourage the public to participate in developing the protection program for wellhead areas and SWAPs under section 1453... ." To gain EPA approval of the plan, the SWAP submitted by the State must describe how the State has ensured broad representation and wide public involvement in the SWAP development. The State must describe how it will make the results of the assessments available to the public in an understandable manner. Many States have already gathered data on contamination sources, performed vulnerability assessments, and analyzed monitoring data on contaminants through implementation of other programs. These efforts need not and should not be duplicated.

The States have considerable latitude in tailoring how public input will be achieved. Yet EPA's August 1997 guidance for State SWAP programs makes clear that certain steps and procedures must be followed in order for a State program to receive agency approval. The legislation states that there must be technical and citizen advisory committees. The committees are likely to work most effectively if they represent a broad range of interests and expertise. The SDWA requires that any resulting State program must be subject to one or more public hearings and that there be, "notice and opportunity for public hearings on the State program before it is submitted to EPA... ."

With some justification, State environmental agencies maintain that local leaders and community groups often do not uphold their half of the public participation process. In a recent interview with National Center for Small Communities staff, Vanessa Leiby, executive director of the Association of State Drinking Water Administrators (ASDWA) said, "At the last ASDWA meeting in February, we had an entire workshop devoted to public involvement and outreach. We recognize the difficulty in reaching part-time officials in sparsely settled areas with other full-time commitments. States are learning about effective tools, using State and local chapters of national organizations, for example, to spread the word about meetings, and using newer technologies such as the Internet. They can only go so far, however, and local communities need to get energized and involved."

The SWAP Guidance addresses the lack of local input by requiring that a number of interests be invited to serve on the State committees. But for local government representatives and others, committee membership carries with it the responsibility to bring well-informed, timely and broad-based community concerns to the planning process.

States have responsibilities, as well: the public participation requirement cannot be satisfied by a State simply certifying that such committees exist and that public hearings were held. A State Source Water Assessment Plan must document that the State has:

- convened the required Statewide technical advisory and citizen advisory committee(s). (EPA will allow a single committee, if both the technical feasibility and the desirability and appropriateness of the State's SWAP approach are given adequate consideration.);
- provided an opportunity for representatives of public interest groups, public health groups, vulnerable populations (elderly, dialysis patients, people living with HIV/AIDS, etc.), business and agricultural interests, local governments, tribes, environmental and land conservation groups, developers, drinking water suppliers, and wastewater treatment operators, etc. to participate on the advisory committee(s);
- conducted public hearings, meetings, focus groups or other public forums for general public involvement outside of the more structured input of the advisory committees. (Those persons invited to

comment from the general public must be given adequate notice and time to review the planning documents.); and

- demonstrated its responsiveness to significant public comments and opinions in developing the plan that has been submitted to EPA.

Local leaders interested in a voice in their State's source water planning process should be familiar with these requirements and keep track of their implementation. EPA's program review protocols provide a checklist for measuring the implementation of public participation and other key SWAP requirements at the State level. For a copy of the protocols, contact your State's advisory committee convenor. (See appendix I or the EPA Office of Ground Water and Drinking Water web site at <http://www.epa.gov.OGWDW/swp/status.html>.)

#### D. Source Water Assessment Review Protocols

To help both EPA staff in reviewing State plans and to assist States with their decision making, EPA national staff has identified some essential elements to look for in a State SWAP submittal. Local leaders should be familiar with the criteria that will have the greatest impact on local water systems.

The SDWA says that source water assessment programs proposed by individual States will be judged according to how well they provide for, "the protection and benefit of the public water systems (PWSs)." We should recall there are 200,000 PWSs nationwide, serving water to customer bases that number from 25 to the millions.

In its program review protocols, EPA has identified four essential elements that the agency is looking for in a State program. These are: Public Participation; State Approach; Making the Assessment Available to the Public; and Program Implementation. For each of these elements, EPA has developed criteria, or guidelines, to help reviewers evaluate how fully the State has addressed each element. These criteria may serve as major points of reference for local elected officials and other community leaders who wish to comment on the design of State programs. Local leaders will want to pay particular attention to how the State responds to the questions that EPA suggests for use by headquarters staff and its regional evaluators about the State's approach to assessments.

- Is the State's approach for conducting assessments both feasible and practical and will it provide for the "protection and benefit" of Public Water Systems?
- Will the State determination of a water system's susceptibility to contaminants provide information that is both understandable to citizens and useful to decision makers?
- Does the level of detail planned for the assessments allow the state to make accurate susceptibility determinations to meet the needs of citizens and elected decision-makers?
- Is the State assessment program linked to existing and future protection programs, such as the State Wellhead Protection Program?
- States may choose to use a differential approach in their assessment program (i.e., different degrees of exactness for delineations and detail in contaminant inventories for individual or classes of PWSs). If the State utilizes different assessment levels, how has the State factored in system types, system sizes, current monitoring and sensitivity data to support this approach?
- States may also conduct collective, or area-wide, assessments, rather than assessments for each individual PWS. If this approach is used, is it based on the existence of broad, overriding uniform conditions or situations that allow for fairly simple susceptibility determinations?



- Will the State approach generate assessments that will provide for the protection and benefit of PWSs?

EPA's program review protocols continue with more detailed questions concerning three issues of particular interest to local water quality representatives; delineation approaches, contaminant source identification and susceptibility determinations. Here are some of the issues that EPA recommends for thorough evaluation within each of these three areas:

#### Delineations

- Has the State provided separate descriptions for its delineation approaches for groundwater systems and surface water systems?
- Is the State utilizing a groundwater delineation method that is already approved by EPA for the State Wellhead Protection Program or is the State-approved method at least as protective as the federal method?
- How does the State intend to delineate recharge areas not immediately adjacent or surrounding the wells to be delineated?
- How will the State coordinate assessments with neighboring States or tribes?
- How will the States conduct assessments when potential contamination could flow between a ground water and surface water supply (known technically as hydraulically connected water sources)?

#### Contaminant Source Determination

- To what extent will the source inventory identify sources, contaminants, general vs. exact locations, priorities, methods for searching data bases, etc.?
- Will the inventory consider all federally- regulated contaminants as well as any additional contaminants identified by the State?
- How will the State determine "significant" sources of contamination, whether identified at the federal or State level?
- Does the state have a credible rationale for any planned differential contaminant source identification methodology for surface water supplies?

#### Susceptibility Determination

Is the State definition of susceptibility consistent with the EPA definition and will it support State planned protection efforts?

- Do the components of the State susceptibility determination for different settings take into consideration:  
--The physical, biological, chemical, water-related and geologic characteristics, as well as the nature of any ground water and surface water interaction?

- The location, amount, likelihood of release, and effectiveness of mitigation measures for any significant potential sources of contamination?
- The integrity of wells or intakes?

The more that the assessments are oriented towards prevention, the more they will assist States in determining how to make wise choices in the setting aside funds for protection initiatives that are outlined in the earlier discussion of the DWSRF.

Public participation is critical to the success of both the design and implementation of the SWAP program. First, there must be broad-based participation in developing the overall design and implementation of the State assessment program. The required State technical and citizen advisory committees and the public comment period are designed to gather input at the State level. The plan must then be made available to the general public for review and comment.

#### E. Making the Assessment Available to the Public

The success of the SWAP process, however, rests on how useful and how widely used the individual water system assessments prove to be. Again, EPA's program review protocols provide an excellent reference point for community leaders and citizens who want to promote informed choices about local water quality issues.

States are required in the SWAP plan that they submit to EPA to describe:

- procedures for making each assessment understandable to the public (including consideration of those with special audio, visual or multilingual needs);
- schedules, formats, and media outlets (radio, TV, print and Internet, for example) that will assist in the broad and timely dissemination of assessment results;
- feasible plans describing the responsible parties, the timeframe, the availability of descriptive maps and access to supporting or supplemental materials related to the assessment information and an approach for providing that information to the public, when requested.

A new tool that could assist States in both conducting the assessments and in making the assessment results available to the public is EPA's *Surf Your Watershed* initiative. Through the *Surf's* site on the Internet, the public can access information on water quality, including that available in the Index of Watershed Indicators (IWI). The IWI, or Index, is, to quote the agency, "EPA's first national picture of watershed health." The Index organizes and presents aquatic resource information on a watershed basis, for all 2,111 watersheds in the contiguous United States. Watersheds are those land areas bounded by ridge lines that catch rain and snow, and drain to specific marshes, streams, rivers, lakes, or to ground water. Watersheds are important because activities within them affects and often dictates water quality. National, regional and individual watershed profiles can be downloaded from EPA's website. The URL is <http://www.epa.gov/surf/iwi/>

### III. The Safe Drinking Water Act amendments (SDWA) and Source Water Protection

To a great extent, the U.S. Environmental Protection Agency (EPA) delegates responsibility for fulfilling the 1996 SDWA amendments to State administrative agencies that, in turn, implement federally-mandated activities at the local and watershed levels. Let's look at how the federal and State programs are structured

in order to understand how local leaders can play a role in key decisions related to funding priorities and assistance programs.

The 1996 SDWA amendments established the Drinking Water State Revolving Fund (DWSRF) as the primary mechanism for carrying out activities endorsed by the legislation. To help small town and rural leaders understand and advocate small system needs, *Source Water 2000* will discuss:

- the DWSRF;
- State Source Water Assessment Program (SWAP);
- source water assessment criteria;
- public participation;
- typical rural water system facilities and operations; and
- major federal water quality programs offered by EPA, USDA and HUD.

#### A. The Drinking Water State Revolving Fund (DWSRF)

The 1996 SDWA amendments place a strong emphasis on prevention, as well as treatment, in protecting and preserving the nation's drinking water. This new approach relies upon two key elements: a clear State lead in program development and management; and broad public participation initiatives to build local support and consensus. Congress and EPA encourage States to take the lead in source water protection efforts because, "prevention is ultimately about land use and water quality management, that are generally exercised at the State and local levels."

A major objective of this guide is to explore how local and State interests may complement, and not conflict, with one another. State agencies are allowed considerable flexibility in designing and administering the key components of the 1996 federal drinking water legislation. This delegation of responsibility to the States reflects the growing recognition that federal agencies cannot develop a single, national program that addresses the diverse needs in all fifty States. At the same time, the strong public participation requirement allows the leaders of communities that must take final responsibility for the safety of local water to help shape State priorities and funding decisions.

While the major focus of the federal legislation remains the construction and upgrading of drinking water facilities, the SDWA amendments allow for set-asides at both the national and State levels to establish prevention, technical assistance and local capacity building programs. The programs that deserve the most immediate attention from local elected officials are those directed at source water assessment and protection. To provide maximum benefits to public drinking water, these efforts must be fully integrated into the design of your State's program. In addition, local leaders must provide substantial input in the development of State source water assessment programs as active participants on State technical and citizen source water advisory committees. Ideally, these committees should be ongoing so that local officials can discuss issues with State agency personnel and with each other during the implementation of the source water assessment programs. Local leaders must also gain a seat at the table when State DWSRF funding decisions are being made.

The Safe Drinking Water Act Amendments of 1996 authorize a major funding program to assist public water systems in financing the infrastructure needed to achieve or maintain compliance with SDWA requirements and to protect public health. Specifically, the legislation authorizes the U.S. Environmental Protection Agency to award capitalization grants under the Drinking Water State Revolving Fund to States. Each eligible State has or will receive a percentage of the total annual DWSRF, based on one of two formulas.

Fiscal Year 1997 funds (FY97) were allocated according to the Public Water Supply System (PWSS) formula. Starting with FY98, funds are allocated according to a formula-based on EPA's Drinking Water Infrastructure Needs Survey that was completed in 1997. A new Needs Survey will be conducted every four years. From these allotments, each State can provide low cost loans and other types of assistance to eligible public water systems.

The primary focus of the funding is on capital projects, or drinking water infrastructure, through which most funds are likely to be loaned to and repaid by qualified Public Water Systems (PWSs) for eligible construction activities. But the SDWA also establishes a strong new emphasis on preventing contamination problems through source water protection and enhanced water systems management. This emphasis transforms the previous law from a largely after-the-fact regulatory program into a statute that supports future, sustainable use of water. Aggressive State programs are central to moving from an enforcement to a preventive approach, using strategies that may include source water protection, local capacity development and operator certification programs. States have the option, not the obligation, to set aside a portion of their capitalization grant to fund the eligible activities (including source water activities) as allowed in the statute.

Through the support of these discretionary activities, the DWSRF program will help ensure: that the nation's drinking water supplies remain safe and affordable; that drinking water systems receiving State revolving funds will be properly operated and maintained; and that a permanent source of funding exists in each State to provide financial support to address important drinking water public health and compliance projects or many years to come.

By providing greater funding flexibility under the DWSRF, Congress has placed particular emphasis on ensuring that small systems and those serving less affluent populations have adequate technical, managerial and financial resources to maintain compliance and provide safe water. The success of these discretionary activities will act to safeguard the DWSRF funds that are loaned for improving system compliance and public health protection, and will help to determine whether the new law realizes its potential as a preventive environmental statute.

Let's review the range of set-asides, both required and optional, that are available under the SDWA.

#### Allotment of Funds

The SDWA authorizes a total of \$9.6 billion for the DWSRF through federal Fiscal Year 2003. Each State receives an annual allocation from this total, and must develop a plan to utilize the funds each year. In order to offer input into the annual State plan, local elected leaders must be familiar with the allocation process for federal funds to the States, the range of national and State set-asides, and the types of financial assistance available for funding set-aside projects.

To fund non-DWSRF activities, the SDWA provides for both mandatory and discretionary set-asides from the annual allocations to EPA and discretionary set-asides to the individual States. Table 1 provides an overview of the available set-asides that are described below.

#### National Set-asides

The National set-asides are reserved, or deducted, from the total federal appropriation before the individual allocations to States and territories are distributed. The national set-asides that are taken off the top prior to the allotment to the States include:

- 1.5 % to Indian Tribes/Alaska Native Villages;
- \$2 million annually for Unregulated Contaminant Monitoring;

In addition, there is a separate appropriation of \$10 for Health Effects Studies.

Local leaders should discuss with State officials how they may work together to obtain and utilize national set-aside funding to assist State and local efforts.

#### State Set-aside Activities

The SDWA also authorizes States to provide funding for certain set-aside or non-DWSRF activities. The level of funding for these set-asides is not to exceed certain ceilings. States must weigh the benefits of spending funds for construction and set-aside activities and describe the amount of funds that will be used for each of these priorities in the annual Intended Use Plans (IUPs) that must be submitted to EPA.

At its discretion, a State may set aside up to a designated percentage of its DWSRF funds for the following four categories:

- a. DWSRF administrative expenses--a State may use up to four percent of its annual allotment for the reasonable costs of administering the program.
- b. State Program Management--a State may use up to a total of 10 percent of its annual allotment to: administer the State Public Water Supply Supervision (PWSS) program; *administer or provide technical assistance through source water protection programs* (emphasis added); develop and implement a capacity development strategy; and develop and implement an operator certification program. The State must provide a dollar-for-dollar match for funds redirected from the infrastructure loan fund to be used for these set-aside purposes.
- c. Small Systems Technical Assistance-- a State may use up to two percent of its annual allotment to provide technical assistance to public water systems serving 10,000 people or fewer.
- d. Local Assistance and Other State Programs

Under category d, a State may fund several other categories of activities to assist development and/or implementation of local drinking water protection initiatives. A State may set aside up to 15% RF from its annual DWSRF capitalization grant amount for the specified activities below, with the stipulation that not more than 10% of this amount can be used for any one of the eligible activities.

Local leaders can offer input most effectively on the priority and funding provided for these activities through: active participation at public meetings which many States hold to discuss the overall State Intended Use Plan (IUP) or through face-to-face discussions with State agency officials and State legislators.

*Category d represents a distinct set of programs with a focus on local, voluntary efforts to protect critical water sources. These funds may bring significant benefits to local and county governments and should*

*receive the highest level attention when the State is designing its SWAP and when funding levels are proposed in the State's Intended Use Plan (IUP).*

Let's look at the individual set-asides available in this category.

- i. Assistance to a public water system to acquire land or a conservation easement for source water protection purposes.
- ii. Assistance to a community water system to implement voluntary, incentive-based source water quality protection measures. (Only available to community water systems)
- iii. Support the establishment and implementation of a wellhead protection program (WHP). Local leaders should note that under this set-aside, voluntary and regulatory approaches for ground water protection may be funded, with either grants or loans. This funding is available to all public water systems, not just community water systems.
- iv. Provide funding to a Public Water System to implement a project under the capacity development strategy
- v. Provide funding to delineate and assess source water protection areas:

Funding for the source water assessment set-aside remains the most immediate issue on which local leaders should concentrate their efforts. If your state has not determined its level of funding, make certain that your state designates adequate funding to complete the assessment program. If a commitment to the assessment process has been made, you may draw upon the information in this guide, from the resources listed and from State planning documents to make certain future local protection needs are addressed. A State may set aside up to 10% of FY1997 capitalization grant to delineate and/or assess source water protection areas for public water systems. These assessments are mandatory under the SDWA and include the identification of potential sources of contamination within the delineated areas and a determination on how susceptible the system is to these sources. In most cases, states are taking the full 10 percent, but local leaders should follow closely how these funds are obligated over the four-year time frame in which they may be spent. For example, it is important that the entity or level of government that ultimately is assigned responsibility for conducting all or part of the assessments has sufficient resources, either from the set asides, or elsewhere, to complete the task.

In passing the SDWA, the House Commerce Committee stated in its Final Report that, "States exerting primacy must conduct an assessment of source water areas and, to the extent practical, identify the origins of any contaminants within each delineated area." Every State, therefore, will be conducting this important activity through the State Source Water Assessment Program (SWAP). While the assessments themselves are required, the use of the set-aside from the federal DWSRF to conduct the assessments is discretionary on the part of the States. In its February 1997 DWSRF Guidelines, EPA encouraged States to determine how much it would cost to delineate and assess their source water protection areas, and then take the necessary amount, up to the full 10% allowed, from the FY1997 funds. State-based county, municipal and township associations, as well as numerous environmental and water quality organizations actively supported full discretionary funding of the State assessment programs. Thus far, 41 of the 48 States that have determined how to allocate their 1997 DWSRF funds, have set aside the maximum 10%. The focus

now shifts to designing assessment programs that meet the broadest range of State and local water quality needs and that will lead to the control or elimination of contaminant sources that may threaten public water supplies.

The results of the source water assessments may have an influence on set asides that may be designated for the remaining prevention activities eligible under category d.

Because there is a different mix of problems, needs and resources from State to State, Congress made these State set-asides discretionary and established maximum, but not minimum, funding levels within the specific program areas. If each category was funded at its maximum, a State could set aside up to 31% from each year's DWSRF allocation for set-aside activities. Each State must decide each year the mixture of project and set-aside activities to fund and then describe them in its annual Intended Use Plan. Local and county leaders will want to take part in the required public review and comment process dealing with any of the set-asides that affect local systems.

### **III. How your system works**

Most small town and rural people still assume that water is safe and clean if it looks, tastes and smells good. With the introduction of harmful new bacterial and chemical contaminants from industry, agriculture and development in general, federal and State government have had to respond with increasingly stringent monitoring and treatment regulations for even the smallest public drinking water systems.

For most local officials, "regulation" is an unwelcome word. It is associated with other words like "confusing," "burdensome" and "unaffordable." Most of us recognize, in principle, that environmental legislation addresses serious problems; local governments certainly want to know that their water is safe to drink. But many small town managers believe that the capacity of a small system to comply has been largely disregarded when good legislative intentions finally become regulations.

It is critical that the owners and operators of community water systems understand how their system works in order to take full advantage of the information the assessments are designed to produce. Local officials should know also how, when and where people obtain water from non-community sources. Both comprehensive planning and affordable water rates generally depend on a drinking water system maintaining in-depth information on its own water supply and on potential customers not presently served by the system.

Every small drinking water system must determine if it can afford the cost of current and future testing and treating its drinking water. To understand the value of source water assessments, local leaders should have a broad, non-technical understanding of what happens to the community's drinking water as it moves from its source of collection to its point of use (usually a customer's faucet).

This chapter was written to provide a brief, lay person's summary of where water sources are located, how contaminants are introduced, their immediate and/or long-term impacts on public health and the effect of current and pending regulations.

We believe it is important for local officials to understand how a drinking water system works and the impact of regulations before focusing on individual issues or problems of specific systems. In following drinking water from source to use, we will point out when various regulations are triggered and when other individuals

and agencies should be involved to provide technical assistance, operator training, engineering expertise and so forth.

A number of excellent resources provide local officials and system operators with more detailed information on these issues--their usefulness and availability are highlighted in the text.

***Where do we get our drinking water?***

Drinking water comes from two major sources, surface water and ground water. In general, large systems rely on surface water from lakes, reservoirs and streams, while small systems overwhelmingly draw upon ground water sources found in natural underground storage areas known as aquifers. The SDWA applies to all public water systems that provide piped water to 15 or more hookups or to 25 or more people at least 60 days a year.

***What are the basic parts of a small drinking water system?***

Water systems involve three distinct processes: (1) collection, (2) testing and treatment and (3) distribution. First, water is collected from its source, either from a surface supply (lake, stream, reservoir) or from an aquifer that is protected, in most cases, from surface contamination by rock or other geological barriers.

Second, water is pumped to a treatment plant, where it is tested and treated. The results of the required monitoring may necessitate further treatment for the removal of particular contaminants. States may require some treatment processes, such as disinfection regardless of source; others, such as filtration, may be required only of surface water. The most costly treatment processes are triggered, however, when monitoring reveals a harmful level of a regulated contaminant. These results must be reported to the State regulatory agency and to the public, according to a schedule generally based on system size.

Third, the treated water is distributed, under pressure, through a series of pipes, usually of decreasing diameter, until it reaches individual hookups with homes, businesses, etc. This discussion focuses on the procedures and facilities necessary for a system to provide clean water to its customers. System managers, however, must keep in mind that they are responsible for supporting the treatment plant, the operator and other system needs with proper planning, a sound budget, adequate staffing and so forth.

***Where do contaminants come from?***

It would simplify the monitoring and treatment processes a great deal if there were only a few sources of contamination and if they could be controlled easily or removed inexpensively. Potential contaminants, however, are great in number and occur naturally in drinking water as well as through human activities. In addition to entering drinking water during collection, they also may be introduced into drinking water during the treatment and distribution stages.

Local leaders can benefit their customers by having a basic understanding of how contaminants threaten the local drinking water system--the old adage, "an ounce of prevention is worth a pound of cure," almost always applies when the cost of protecting a water source is compared to the cost of treatment.

Major natural sources of contamination prior to treatment include minerals, salt water, arsenic and products



of decaying radon, radium and uranium deposits. Man-made contaminants enter water sources from agricultural runoff (fertilizers, pesticides, etc.), leaking underground storage tanks, landfills, septic tanks, injection wells, overflowing storm sewers, highways and so on (See chart 2). Some 30 States have initiated groundwater protection programs that identify and attempt to control many of these sources.

Contaminants do not enter drinking water only before it is collected. Water treatment involves the addition of chemicals needed for disinfection and other processes. They, themselves, may pose risks if not maintained at a safe level, or if they combine with other chemicals in the water to form a new, potentially harmful, by-product.

Finally, water can become contaminated even after final treatment through the corrosion of pipes and solder material (copper, lead, asbestos), through the growth of bacteria in pipes, through mixing with water from an untreated source or through a break in the distribution system itself. Most monitoring takes place at the treatment facility to detect contaminants that were present before the water was collected or that occurred during the treatment process. The potential for after-treatment contamination is the basis for monitoring water samples that may be taken at points along the distribution lines belonging to the system, at the point-of-entry (POE) into a service location or at the point-of-use (POU) within a customer's home or facility.

### ***How is water treated?***

Chart 3 illustrates of the treatment processes that surface water, and to a large degree that ground water, typically undergoes before distribution. If contaminants are detected above accepted levels during step 8 (the monitoring process), then the system has to remove them or lower their presence below the maximum contaminant levels (MCLs). But pictures and words can only tell so much about what goes on at a local water system. At least one, if not all members of the town, city or county board of supervisors or water board members should tour the local water system with the operator to learn how the system operates, potential trouble spots and how future water needs will be addressed.

### ***Why is it important to meet federal drinking water standards?***

Some local officials are convinced that the only thing more costly than complying with federal regulations is not complying with them. While system managers should be aware of the potential fines for non-compliance, they should keep in mind that these penalties are generally imposed only on systems for such actions as willful neglect and fraudulent reporting.

The real value of maintaining requirements of the system's permit (usually issued by the state drinking water agency or the county health department) is in terms of public health, protection against liability claims and civil law suits, ability to meet local construction and economic development needs and the confidence of system users, who must support increased user fees and other system needs.

Permits contain a great deal of information. Even those issued to the smallest of regulated water systems may include federal and State standards covering scores and scores of contaminants. Because of their importance and growing complexity, these permit requirements should be read and thoroughly understood by the system operator(s) and at least one of its managers.

As noted above, water safety can be threatened by natural and manufactured contaminants and by naturally

occurring bacteria. Currently, EPA has established MCLs or required treatment techniques for more than 80 contaminants. But this does not mean that water systems will have to conduct 80 or more separate tests regularly when the full monitoring schedule has been phased in.

Many chemicals share properties which enable entire groups to be detected and measured by the same analytic method and monitoring schedule. For example, the test for the chemical chlordane, that costs approximately \$400, also detects the presence and level of 20 other regulated contaminants. Federal regulations allow for such multiple detection methods whenever possible.

Let's look now at the major classifications of contaminants and the required schedule for testing. The terms listed below in bold type appear frequently in regulatory and technical assistance materials for small drinking water systems. The following section is intended as a summary to help local leaders become familiar with major classes of chemicals (and a few individual contaminants) in order to develop a well informed monitoring and treatment strategy and to understand what source assessments should be directed to identify.

**Inorganic Chemicals (IOCs)** - These minerals or metals are found in nature and are also created through such human activities as mining, industry and agriculture. They may cause damage to many of the body's major internal organs and systems, as well as the skin and bones, when present in amounts that exceed the MCLs. Nitrate and nitrite are two widely detected IOCs for which all systems must test. Infants are particularly vulnerable to nitrates and nitrites, as they can cause "blue baby syndrome." Asbestos, lead and copper also require special attention. These three IOCS can enter drinking water from the corrosive action of the water itself on pipes and sealants in the collection system, the distribution system or the customer's own plumbing. Fluoride, another IOC, may cause bone damage when it exceeds the levels that many systems maintain in their water to prevent tooth decay.

**Synthetic Organic Chemicals (SOCs)** - These manufactured compounds are used for agricultural and industrial purposes and, as a group, can damage the nervous and reproductive systems, kidneys and liver, as well as increasing the risk of cancer. Federal monitoring requirements separate SOCs into two different groups, pesticides and polychlorinated biphenyls (PCBs).

**Volatile Organic Chemicals (VOCs)** - These are organic chemicals that have plant or animal matter as a source, such as petroleum by-products. VOCs are especially dangerous because they can be absorbed through the skin or ingested via drinking water. VOC contamination of drinking water can occur in most water systems, since sources include leaking underground storage tanks and the dumping of used motor oil. These contaminants can cause the same serious health problem associated with SOCs.

**Bacteria (Coliform Monitoring)** - Many drinking water systems are required to test frequently for various kinds of bacteria and to provide disinfection before water leaves the treatment facility, even if bacteria do not exceed safe levels. Coliform bacteria occur in human and animal waste, and their presence may indicate the presence of pathogenic (disease-causing) bacteria. Bacteria are responsible for the vast majority of disease-related violations that occur each year and, because of their source, cause the greatest public outcry. MCL violations for specific types of coliform constitute an "acute" violation of a system's drinking water permit (because they involve an immediate threat to human health) and require public notification on an urgent basis.

**Disinfection By-products** - Some organic chemicals may be created when disinfectants, such as chlorine,

are used in the water treatment process. At present, over 90 percent of all surface water systems and about half of all groundwater systems use disinfectants that can react with other chemicals in water to create compounds that increase cancer risk. There is new evidence that these by-products are dangerous to pregnant women and to unborn children.

**Radionuclides** - These are radioactive particles that occur naturally in areas of uranium and radium deposits and as a by-product of nuclear reactive processes, for example, at nuclear power plants. Even small doses pose a cancer risk.

**Protozoa (Cryptosporidium and Giardia) and Viruses** – Giardia is regulated under the Surface Water Treatment Rule. Regulations for cryptosporidium will be in place before the States complete submittal for the plans for the required Source Water Assessment Program (SWAP).

Controlling and removing contamination require both preventive measures and treatment. In addition to the resources available through the source water set-asides in the SDWA, there are a number of other federally-funded programs to assist with the development of community water quality projects.

#### **IV. Tools for Financing**

##### Drinking Water State Revolving Fund

In 1996, the DWSRF broke new ground by placing a major focus on the protection of water quality, as well as on cleanup and treatment. Funds appropriated by Congress are distributed to those designated State agencies that have developed a DWSRF program that meets federal requirements to receive a DWSRF capitalization grant. These agencies, in turn, award loan funds to construct or upgrade eligible projects that promote better public health and compliance with the SDWA requirements. Eligible public water systems must be included on the State's priority list in order to be eligible for funding. As with the clean water fund, this list must be included in the State's annual Intended Use Plan (IUP) for the DWSRF. This Intended Use Plan must receive EPA approval before the proposed activities may be funded by the State.

The drinking water amendments of 1996 also allow States to set aside up to 31 percent of each year's DWSRF allotment to administer the DWSRF program and to assist eligible public water systems in protecting their source water and to build the skill levels and administrative capacity of small system managers and operators. These set-asides will have been described in some detail earlier in Section II of the guide. The SDWA also allows flexibility for individual States to shift up to one third of their annual appropriation from State drinking water revolving fund to the clean water revolving fund or an equivalent amount from the CWSRF to the DWSRF. Congress reasoned that some States might have more pressing needs to fund drinking water projects than wastewater projects, or vice versa, and should have the discretion to target a percentage of the total federal water-quality dollars to where the need is greatest.

State DWSRF agencies are listed on the EPA web site at <http://www.epa.gov/OGWDW/DWSRF.htmlsrf.htm>. Telephone or mail inquiries for the DWSRF and for other EPA programs discussed below should be directed to:

Regulation Implementation Branch  
U.S. EPA  
401 M Street, SW (4606)

Washington, DC 20460  
202/260-5526

#### Water and Waste Disposal Grant and Loan Program

For many years, this program was administered by the Farmers' Home Administration (FmHA) within USDA. The program itself has survived, despite several name changes at both the federal and State levels of the agencies that manage the program. The 1996 Farm Bill combined USDA's small system water and sewer funding with other grant and loan programs for rural utilities (electric power, telecommunications, telephone). These programs, collectively, are now part of the Rural Utilities Service (RUS) that is administered at the State level by the federally-funded Rural Development Office. Eligible water and sewer projects must:

- document that they are located in a rural area or town with a population of less than 10,000 people; prove they are unable to obtain financing at reasonable rates through conventional outlets;
- establish that the project is fiscally viable;
- certify they have the legal authority to construct, operate and maintain the water or wastewater facility; and
- provide supporting information that any loan assistance is backed locally by both adequate security and the ability to repay on schedule.

While municipal, town, township and county governments are the primary beneficiaries of the RUS program, special districts, cooperatives, associations and Indian tribes may also qualify. Many applicants take their first step towards funding by contacting the nearest Rural Development district office, many of which house the U.S. Cooperative Extension Service programs.

#### Environmental Quality Incentives Program

Like the SDWA, the 1996 Farm Bill established an environmental program with prevention as its major objective. The EQIP program encourages agricultural best management practices (BMPs) to minimize or eliminate contamination from pesticides, nutrients and concentrated animal feeding operations (CAFOs). Urban and rural runoff account for about half of all remaining water pollution, and EPA has signaled that it may impose much more stringent standards on thousands of large feedlot operations, many of which are unregulated. USDA's EQIP offers local governments an opportunity to partner with the agricultural community through financial incentives to farmers for their adoption of voluntary BMPs for up to five years. EQIP was funded for the first time in Fiscal Year 1998 for \$200 million. The administration's proposed 1999 budget requests that funding be increased 50 percent to \$300 million.

Recommendations for EQIP-funded projects must be approved by the State office of the National Resources Conservation Service (NRCS), the successor to the Soil Conservation Service. The State receives recommendations from district committees, which gather input and information from a wide range of interests, including agriculture, local government, environmental groups, water and sewer authorities, and area planning organizations.

The name, address and phone number of individual State Rural Development offices are available at <http://www.usda.gov/rus/water/States/usamap.htm>. Information also may be requested by telephone or mail from:

U.S. Department of Agriculture  
RUS, Water and Environmental Programs  
1400 Independence Avenue, SW  
Washington, DC 29250  
202/720-9583

### Community Development Block Grant (CDBG) Program

The CDBG program has been funded for more than 25 years. Each year, cities over 50,000 and urban counties over 200,000 receive funding on a formula basis to carry out housing, economic development and infrastructure projects that primarily benefit low-and moderate-income people. Seventy percent of the funding is distributed to urban counties and cities. The remaining 30 percent (or "small cities" portion of the annual CDBG appropriation) is distributed by State community affairs agencies to small cities of less than 50,000 and to rural counties of less than 200,000.

Funding is awarded to local governments through a competitive application process for projects that must meet the same income and eligibility criteria as big city, formula grant recipients. Individual States may further target grants to projects that benefit low-and moderate-income people or promote economic development, public health or affordable housing.

The "small cities" portion of the CDBG is the largest single federal grant program for small and rural communities. Over the years, it has been an important component in a number of jointly financed local projects. Often, CDBG funds provide essential grant dollars in a comprehensive financial package that may include loans from the EPA and USDA. CDBG also funds numerous local economic-development initiatives, including Main Street project renovations, business incubators and start-up capital. Future business development that will make increased demands on current water supplies should certainly be factored into long term source water protection programs.

Information on the CDBG Program, including a listing of State contact agencies, is available at the HUD web site, <http://comcon.org/programs/ccprog.html>. Written and telephone requests may be made to:

The Information Center  
U.S. Department of Housing and Urban Development  
Office of Community Planning and Development, P.O. Box 7189  
Gaithersburg, MD 20898-7189  
Information Center: 1-800-998-9999  
Fax: 301-519-5027  
TDD: 1-800-483-2209