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LAND-GRANTS AND USDA PROGRAMS HELP PROTECT DRINKING WATER SOURCES

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Pristine water sources are a thing of the past, the victim of population growth and increased pollution. Utilities can no longer assume the source water they treat is high-quality. They must now investigate the condition of their source water and take actions to improve it, if possible. The 1996 amendments to the Safe Drinking Water Act (SDWA) provide grant support and a mandate that those state agencies responsible for enforcing drinking water regulations, using guidelines developed by the U.S. Environmental Protection Agency (EPA), design a program with designated actions for utilities to take to improve their source water quality.

Source Water Protection Since Early Times

Source water protection is new terminology in the 1996 amendments to the SDWA, but it is an age-old practice of selecting and protecting the best public water source available. Historically, drinking water sources were chosen because they originated in pristine watersheds. Ancient Romans had more than 250 miles of aqueducts to transport water to Rome from undeveloped mountainous areas. When distant pristine sources could not be obtained, efforts were made to protect the local drinking water source from contamination. These same approaches gained in importance as civilizations advanced and people learned more about diseases and other health related problems associated with contaminated water.

Using Technology to Protect Water Quality

With rapid population growth, pristine watersheds became more rare and suppliers began to focus more on technological solutions to ensure drinking water quality. By the 1890s, filtration systems which had originally been used to clarify water and improve its taste and odor, were found to also improve water's biological quality. The advent of the microscope led to the discovery of microorganisms in water, and methods to kill these organisms rapidly developed. Chlorine disinfection of drinking water, the most accepted approach, was first used in the United States in 1908 in Chicago. Disinfection of drinking water with chlorine or other methods (e.g. ozone and u.v. light) expanded rapidly and is still a common practice.

Regulations to Protect Water Quality

With further population growth, industrialization, and more intensive land use, contamination problems have become more widespread. Subsequently, laws have been passed to protect water sources from excessive degradation. Two of the most important federal environmental statutes for protecting water sources are the Federal Water Pollution Control Act Amendments of 1972 (now referred to as the Clean Water Act) and the Safe Drinking Water Act (SDWA) of 1974. Both laws have been amended several times. The Clean Water Act (CWA) is designed to protect the quality of all water sources, whereas, the SDWA is designed specifically to regulate and protect drinking water supplies.

Source Water Assessment and Protection Programs. The last major amendments to the SDWA were passed in 1996. These amendments initiated a number of new programs to further protect our public drinking water supplies from contamination. Two of the new programs are Source Water Assessment and Source Water Protection. In 1997, EPA published guidelines for states to follow in developing and implementing these two programs. The EPA Guidance requires that states must: 1) identify waters that are sources of public drinking water, 2) inventory contaminants in the water supply, 3) assess the water system's susceptibility to contamination, and 4) inform the public of the results.

States should have a Source Water Assessment Program (SWAP) approved by EPA by no later than early 2000, and most system assessments should be completed by sometime in 2003. Results of these assessments must be made available to the public soon after they are compiled. Managers of some water systems fear the public may blame them for contaminants in the water supply. What EPA is hoping for is more public support to implement stronger pollution prevention programs.

While the EPA Guidance gives states limited flexibility in how they implement the required Source Water Assessment Program, individual states have greater flexibility in how they approach the non-mandatory Source Water Protection Program. However, EPA is encouraging states to develop a voluntary Source Water Protection Strategy that encourages special incentives for water systems to implement a Source Water Protection effort. This could include special collaboration or even a partnership with organizations or agencies such as USDA. Grant support provided under 1996 amendments to the SDWA are about $150 million per year with most of this going to assessment, other than protection efforts. On the other hand, the U.S. Department of Agriculture offers about $2.5 billion dollars worth of incentive programs that can improve source water quality.

USDA and Land-Grant Programs Can Improve Source Water Quality

Among USDA programs that can improve source water quality are the Conservation Reserve Program, the Environmental Quality Incentives Program, the Wetlands Reserve Program, the Wildlife Habitat Incentives Program, and the National Conservation Buffer Initiative. These programs are aimed primarily at agricultural land and address threats to soil, wildlife and water quality. They support cover-crop planting, reduced tillage practices, and improved livestock operations (an important step in controlling potential sources of *Cryptosporidium*). They also support the restoration of wetlands, which filter sediments, nutrients and other pollutants and recharge groundwater. In addition, they pay for the planting of buffer zones adjacent to reservoirs, streams and other water supplies.

Land-Grant universities are involved in a number of programs that can improve source water quality. They are directly involved in collaborative research with USDA, are the primary outreach education arm of USDA, and they have a unique federal, state and local partnership that places professional educators in almost every county in the nation. Much of the research on pollution prevention practices, especially in agriculture and forestry, is carried out by Land-Grant institutions. Extension, the outreach education component of the Land-Grant system, takes this technology to the public. Extension is involved in numerous outreach education efforts to protect source water quality. These programs may be directed toward farmers, ranchers, foresters, homeowners, businesses, or in other words, just about everybody.

Both USDA and Land-Grant universities have made a commitment to help protect drinking water sources. Incentive and research efforts are better funded than outreach education efforts at this time. Extension however, is committed to educating citizens about pollution prevention. If Drinking Water State Revolving Fund monies or other dollars are made available to accelerate outreach education as a component of Source Water Protection efforts, Extension should be involved. No organization has a comparable delivery network or is better qualified to deliver scientific-based outreach education programs on pollution prevention. Through direct interaction with citizen volunteers, Extension has the ability to present locally-based information to any audience within any geographical territory. This territory could be a high priority watershed or wellhead protection zone with a particular concern or problem. However, Extension must shift internal resources to enhance targeted education

efforts on source water protection if budgeted support for this effort is not made available.

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