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ALABAMA A & M AND AUBURN UNIVERSITIES

## Drinking Water Standards Safe Drinking Water: Who's In Charge?

**M**any Americans take safe drinking water for granted. It's not hard to see why. What could be easier than turning on the tap and getting gallons and gallons of drinkable water? But behind each gallon, behind each drop is the unceasing effort of scientists, engineers, legislators, water plant operators, and regulatory officials. It is their mission to keep this precious resource clear, clean, and—above all—safe.

Our drinking water comes from two different categories of untreated water. About half comes from rivers, streams, and other forms of surface water. The other half comes from groundwater—reserves of water hidden beneath the earth in areas known as aquifers. Protection of both surface water and groundwater is vital if we are to have drinking water that is not only safe but plentiful.

### How Can Water Become Unsafe?

Several different kinds of contamination can result from natural causes. Undissolved material—known as suspended matter—shows up frequently in untreated water, as do dissolved minerals and salts, such as sulfates, chlorides, and nitrates. Both arsenic and fluoride occur naturally as impurities in some areas. Radionuclides occur naturally in minerals such as radium and uranium and include the radioactive gas known as radon.

People, too, can have an adverse effect on water quality. Throughout most of recorded history, human organic waste has posed the greatest threat to the safety of drinking water. Although water treatment processes have greatly improved the quality and safety of drinking water in the United States, there are still many thousands of cases each year of waterborne diseases caused by such microorganisms as bacteria, viruses, protozoa, parasitic worms, and fungi.

Chemical contaminants, both natural and synthetic, might also be present in water supplies. Contamination problems in groundwater, which supplies 85 percent of the small community systems, are frequently chemical in nature. Common sources of chemical contamination include minerals dissolved

from the rocks that form the earth's crust; agricultural pesticides, fertilizers, and animal wastes; leaking underground storage tanks and pipelines; industrial effluents and sewage treatment plants; seepage from septic systems and landfills; and improper disposal of chemicals in or on the ground.

Although disinfection of drinking water is absolutely essential to prevent diseases, this treatment process itself must be monitored to prevent the creation of potentially hazardous by-products. Chlorine, for example, can react with natural organics or other synthetic hydrocarbon chemicals in water to form substances called trihalomethanes (THMs). These have been shown to cause cancer in laboratory animals. Chloroform is a common THM which has been linked to bladder cancer in those who drink from treated public water supplies.

Other disinfectants have also been found to generate undesirable by-products. Developing a safer disinfectant for drinking water is a high research priority for water chemists.

### Who Keeps Your Drinking Water Safe?

The Environmental Protection Agency (EPA) and state water quality agencies, Alabama Department of Environmental Management (ADEM) in Alabama, work together to protect surface water and groundwater so that every citizen drinks safe water.

Historically, states set their drinking water standards and ran their drinking water programs. This changed in 1974, when Congress passed the Safe Drinking Water Act (SDWA). Alabama was granted primary enforcement of this Act in 1976. This Act established national drinking water standards. These standards set limits on the amount of various contaminating substances allowed in drinking water. The SDWA has been amended several times, most recently in 1986. The amendments require the development of more drinking water standards and more technical requirements.

EPA has responsibility for writing the regulations and carrying out the provisions of the SDWA. Howev-

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er, EPA does more than simply issue drinking water standards for states to enforce. It has awarded grants to many states for the purpose of improving their testing and analytical capabilities. It has also sponsored research into many different aspects of drinking water pollution, including important research on organic chemicals and radionuclides.

In addition, EPA is responsible for ensuring that water systems notify the public when contaminant levels exceed federal water quality standards. These notices of violation must explain the health significance in nontechnical terms. This important requirement is a keystone of EPA's efforts to assure compliance with the national drinking water regulations and to protect public health. It also fosters awareness of the importance of safe drinking water and encourages the public to assist in solving water quality problems.

The federal drinking water program was designed to be delegated, which means that approved government agencies (usually states) carry out the program on a day-to-day basis. Most states (49) have been delegated "primacy," or the authority to run the program. State public health or environmental agencies, therefore, have primary responsibility for carrying out and enforcing the drinking water regulations written to implement the SDWA. In Alabama, this responsibility is relegated to the Water Supply Branch under the Water Division of ADEM.

Each regulatory agency has the option to make its own requirements more strict than EPA's. In addition, regulatory agencies can issue variances and exemptions from some of the requirements for public water systems that are having major technical or financial problems in meeting the requirements. Variances and exemptions are rare, and the supplier of water must prove there is no undue health risk by allowing the variance or exemption for a period of time.

Finally, local public water systems must ensure that drinking water supplies meet standards and regulations established by the state regulatory agency.

### **Public Water Systems: Supplying Safe Water**

Public water systems are divided into two categories: community systems and noncommunity systems. A community system serves people year-round (in a town, for example) whereas a noncommunity system serves people only for a portion of the time (in a resort or campground). Different types of requirements apply to each type of water system.

Nationwide, about 200,000 public water supply systems are regulated under the SDWA. Of these, approximately 60,000 community systems serve nearly 200 million residential customers (about 80 percent of the U.S. population). In Alabama about 3.25 million residents (approximately 80 percent of the population) are on community water systems.

Community water systems range from water treatment plants serving major cities to systems serving a single trailer park. Although most people are served by a large water supplier, the majority of community systems are very small. This is reflected in the following table.

**Table 1. Distribution By Size For Community Water Systems.**

Size Of System	Percent Of Systems	Population Served
Large (>3,300 pop.)	13 percent	180 million
Small (<3,300 pop.)	87 percent	20 million

Source: USEPA 1990<sup>b</sup>.

Of the 850 public water systems in Alabama, 250 water suppliers are noncommunity systems. They include restaurants, schools, highway rest areas, and campgrounds.

Individual wells and systems that serve fewer than 25 people or have fewer than 15 service connections are not considered to be public systems. They are the sole responsibility of the states to regulate.

### **Community Wellhead Protection Programs: Keeping Groundwater Sources Safe**

Local public water systems and municipalities can keep drinking water safe by participating in programs to protect groundwater sources, known as Wellhead Protection Programs (WHPP). Discharges of many potential groundwater contaminants are not regulated at the state and federal levels. These unregulated and often overlooked activities are sources of potential contamination and pose additional risks to local groundwater sources.

Acting within federal guidelines, ADEM has developed a WHPP strategy for local public water systems and municipalities in Alabama. A WHPP follows a four-step process: geologic and hydrologic investigations, definition of protection area boundaries, contaminant source inventory, and management plan development.

The first step in WHPP development is a geologic and hydrologic investigation. To understand where groundwater is located and how it moves, the geology and hydrology of an area must be defined on a local, site-specific level.

The next step is defining a wellhead protection area boundary with the information generated in step one. Because of different geologic and hydrologic conditions, protection areas will be quite different in shape and size.

Step three, a contaminant source inventory, is possibly the most important WHPP development step. The size of a community, the size of the well-head protection area, and the extent of industrial or residential development will determine the number and the type of contaminant sources. Local knowledge and local participation are the keys to a successful contaminant source inventory.

The final step in a WHPP is to design a management plan to reduce hazards of known contaminants and control development of facilities with potential for contamination. A locally developed management plan identifies the responsible authorities and the goals of the local WHPP.

In Alabama the first locally developed and comprehensive WHPPs have been developed by Dauphin Island, Loxley, and Madison. These communities developed WHPPs that provided local, community-specific programs for protecting their groundwater supplies.

Assistance in developing a local WHPP is available from Alabama Department Environmental Management, Water Supply Branch (334-271-7773) or Geological Survey of Alabama, Water Resources Division (205-349-2852).

## You And Your Drinking Water

What can you—the average U.S. citizen and consumer of drinking water—do to make sure your drinking water is safe? What are your rights and responsibilities?

You have the right to know who is supplying your water, where it comes from, how it is treated, how it is tested, and what its quality level actually is.

You have the right to be told—and your water supplier must tell you—if your water does not meet the minimum national standards for protection of public health. You must be told what the violation is, what adverse health effects it is likely to have, what steps are being taken to correct the violation, and whether you need alternative water supplies.

The fact that your state water quality agency or local water supplier announces a violation of a drinking water standard is not by itself cause for alarm. It is a safety precaution required by Congress to call public attention to deficiencies in the drinking water supply. This procedure is intended to keep you informed so that you can make intelligent decisions about the problem.

If your drinking water supply comes from a well or some other private system, you have the responsibility to ensure your drinking water is safe.

A description of rights and responsibilities for protecting and maintaining safe drinking water follows.

## Rights And Responsibilities: Keeping Drinking Water Safe.

### Nationally

#### *EPA Drinking Water Program:*

- Sets primary and secondary drinking water standards.
- Establishes monitoring and reporting requirements.
- Provides funds and technical assistance to the states.
- Conducts research.

### Statewide

#### *State Groundwater Protection Agencies:*

- Develop groundwater protection plans.
- Develop programs and laws to control contaminating sources and activities.
- Conduct statewide monitoring of groundwater.

#### *State Drinking Water Programs:*

- Enforce primary drinking water standards.
- Provide technical support and training to staff of local water systems.
- Inspect systems and maintain records.
- Take enforcement action against systems that violate monitoring and reporting regulations or drinking water standards.

### Locally

#### *Local Pollution Control Agencies:*

- Protect surface water through land-use control.
- Protect groundwater from contamination by controlling potential sources of contaminants.
- Monitor groundwater to detect contaminants.

#### *Local Water Systems:*

- Site wells and intakes (pipes that draw water into drinking water systems).
- Treat water to meet drinking water standards.
- Sample water and maintain test records.
- Notify the public if problems arise.

### Personally

#### *You, The Citizen:*

- Notice potential sources of surface water and groundwater contamination.
- Support efforts to protect vital water resources.
- Keep track of local and state developments relating to the quality of your drinking water.
- Attend public hearings related to protecting local drinking water.
- Stay informed of drinking water tests in your area
- Lend political and financial support when necessary to efforts to improve the quality of your drinking water.
- Exercise your right to bring civil suits when your local water system, your state, or your federal officials fail to do their job in maintaining the quality of your water.

Source: USEPA 1986<sup>1</sup>.

## Other Laws Protecting Drinking Water Supplies

The **Clean Water Act** sets water quality standards for all significant bodies of surface water, requires sewage treatment, limits the amount of industrial effluents that can be discharged into the nation's surface waters, and requires programs to control nonpoint source pollution from stormwater runoff.

Under the **Resource Conservation and Recovery Act (RCRA)**, EPA has developed "cradle to grave" regulations governing the generation, storage, transport, treatment, and disposal of hazardous wastes. RCRA gives EPA the power to protect all sources of groundwater from contamination by hazardous waste. This law also prohibits pollution of surface water and air by hazardous waste sites.

The **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, better known as "Superfund," is used to cleanup existing hazardous waste sites that pose a threat to water or other resources.

The **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)** and the **Toxic Substances Control Act (TSCA)** give EPA the power to regulate pesticides and toxic substances that may have an adverse effect on the environment, including groundwater and other sources of drinking water.

Additional information about safe drinking water, the amendments to the Safe Drinking Water Act, and other related issues is available from EPA's Safe Drinking Water Hotline: 1-800-426-4791.

The EPA Region IV (covering Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) has its offices at 345 Courtland Street, NE, Atlanta, GA 30365. This

regional office of the EPA can also provide you with information. (Call 404-347-4727.)

## Conclusion

Congress continues to challenge EPA and the nation with stricter drinking water legislation. Along with setting new standards, EPA is also reevaluating the existing standards. Making a reality of the stricter provisions will require greater efforts by all those involved in protecting drinking water: local, state, and federal officials; scientists, engineers, and water treatment plant operators; and individual citizens.

When these provisions become reality, we will all reap the benefits and reassurance of even safer drinking water than we already enjoy. No one can exaggerate the importance of safe drinking water to the health and prosperity of all U.S. citizens.

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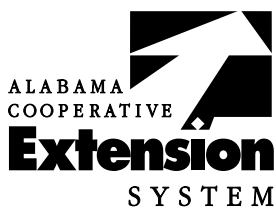
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