The Florida Department of Environmental Protection's

Drinking Water Program

A Primer for the Consumer

April 2008

DEP's Drinking Water Program

To provide interested consumers with a better understand how the Department of Environmental Protection's (DEP) Drinking Water Program ensures the safety of public drinking water supplies, DEP has developed this brochure.

The Drinking Water Program implements provisions of the Safe Drinking Water Act through regulation of public water systems. This regulation includes the permitting of public water systems, regular water quality testing requirements, and physical plant inspections. Public water systems are publicly and privately owned facilities that supply drinking water to at least 25 people, or to at least 15 service connections, at least 60 days out of the year. Public water systems are further categorized based on the frequency with which the same people are served.

- Community water systems provide drinking water to the same residents year-round. Municipal water utilities are usually community water systems.
- Non-community water systems are public water systems that do not meet the definition of a community water system.
    - Transient non-community water systems do not supply water to the same people on a regular basis. Highway rest areas and remote parks with their own water systems are often transient non-community water systems.

Filter at the City of Boca Raton's Water Treatment Plant in Palm Beach County.

- Non-transient non-community water systems supply water to at least 25 of the same people at least 6 months per year, but not year-round. Schools, factories, and day care centers with their own water systems are often non-transient non-community water systems.

This classification, together with the overall size of the system, is sometimes a factor in how frequently, and for which contaminants, a public water system is required to carry out routine water quality testing.

Not all drinking water systems are covered by the Safe Drinking Water Act. The Florida Department of Health regulates very small systems that do not meet the definition of a public water system, such as limited use public water systems and private water systems. The water quality of private wells is not regulated; owners of private wells are responsible for ensuring the safety of their drinking water themselves. To learn more about the Department of Health's water programs, visit www.doh.state.fl.us/environment/water.

DEP's Drinking Water Program is headquartered in its Tallahassee office, which is responsible for writing rules, developing policy, data management, and overseeing special initiatives. Enforcement of rules, review of water sampling results, and permitting of new construction is carried out at the local level by six district offices and several approved county health departments that have been delegated this authority by DEP.

Water Quality

Laboratory at U.S. Sugar Corporation's Water Treatment Plant in Hendry County.

DEP's Drinking Water Program ensures that customers receive high quality drinking water by requiring public water systems to deliver water that is neither a health risk nor aesthetically objectionable due to taste, odor, or color. The water from rivers, lakes, and underground aquifers that ultimately becomes our drinking water may contain a number of different contaminants, which may be either naturally occurring or result from human activities.

A maximum contaminant level (MCL) is the maximum permissible level in drinking water of a specific contaminant. These levels are established by the U.S. Environmental Protection Agency to protect public health. Contaminants of concern include:

The Drinking Water Program's jar testing equipment.

- inorganic compounds - such as salts and metals
- volatile organic contaminants - like benzene and vinyl chloride
- synthetic organic contaminants - including PCBs and various pesticides and herbicides
- radionuclides - such as radium and uranium
- pathogenic microorganisms - such as bacteria and viruses
- byproducts of disinfection - like trihalomethanes and haloacetic acids

Contaminants originate from a wide variety of sources – farming, mining activities, gas stations, septic systems, leaky underground storage tanks, suburban lawns, wildlife, and many other sources. Contaminants seep into ground or surface water in storm water runoff and domestic and industrial wastewater discharges. Some contaminants, like inorganic and radioactive compounds, can also occur naturally in the soil and rocks with which water comes in contact.

Influent lines at the Peace River Regional Water Treatment Plant in DeSoto County.

Source Water

The type and concentration of contaminants present in a public water system's raw water are frequently related to the source of that water. The source of a water supply, therefore, plays a role in determining the treatment processes employed to clean it. Sources of drinking water include:

- Surface water

Surface waters generally require filtration and higher levels of disinfection than ground water because they tend to have greater turbidity (cloudiness) and higher levels of microbial and chemical contamination.

- Ground water

Ground water tends to have a higher mineral content and be "harder" (high concentrations of calcium and magnesium) than surface water and more frequently requires softening.

- Ground water under the direct influence of surface water

Water quality of ground water under the direct influence of surface water is closely correlated with climatological or surface water conditions and must, therefore, meet some surface water treatment requirements.

- Purchased water

Some public water systems purchased water from another system for resale to its customers through its distribution system. Depending on the level of treatment it received before being purchased, purchased water may require full, limited, or no additional treatment.

Water Treatment

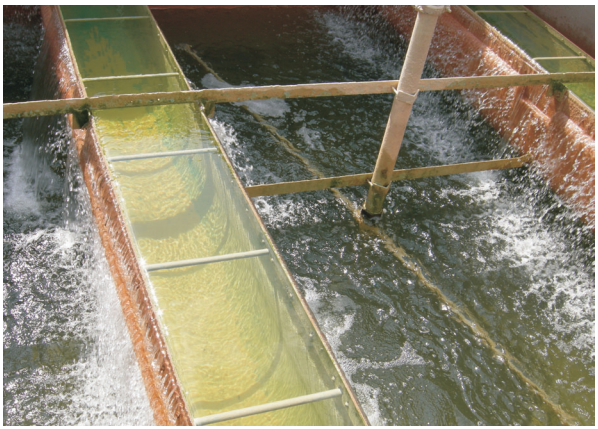
Many treatment options exist for removing contaminants from water and improving aesthetic qualities. Common treatment processes employed in rendering water safe to drink, or potable, are described here.

- Coagulation and Flocculation

Chemicals are sometimes added to cause fine particles in the water to coagulate, or stick to one another, and flocculate, or form large, dense particles called floc, which more easily settle from the water.

- Sedimentation

Larger particles and flocs are allowed to settle under the influence of gravity. Large, dense flocs ensnare and trap smaller compounds on the way to the bottom of the clarifier or sedimentation basin providing additional treatment.



Backwashing of the filter at the City of Ormond Beach's Water Treatment Plant in Volusia County. During backwashing, water is pumped back through the filter from the bottom to the top, expanding the filter and unclogging the pore spaces between the filter particles. After backwashing, the filter material settles back into position based on the relative density of the filter media (e.g., sand, anthracite, activated carbon).

Sludge settling ponds at Lee County Utilities' Olga Water Treatment Plant. Waste streams produced during treatment are allowed to settle in these ponds. The relatively clear water overlying the settled material is returned to the head of the plant.

- Softening

If the water is hard (high in calcium and magnesium), it may be softened in order to reduce the tendency for minerals to form a scale in pipes and hot water heaters. The addition of chemicals such as caustic soda, lime, and soda ash causes calcium and magnesium to precipitate out of solution.

- Filtration

Water is passed through filters to remove suspended solids, algae, unsettled floc, and softening precipitates. Filters are typically designed in layers of different media with different densities and pore sizes. This allows for better removal of contaminants, as well as less clogging and easier filter cleaning.

- Disinfection

Disinfection is employed to kill microbes in the water. A residual chemical disinfectant ensures that they will not reemerge in the water as it moves through the distribution system.

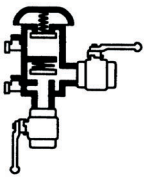
Clarifier at the City of Ocala's Water Treatment Plant in Marion County. This clarifier combines mixing, coagulation, flocculation, sedimentation, and softening in a single tank.

Water is also often stabilized in order to produce a non-corrosive water that will limit the leaching of lead from lead containing pipes, solders, and faucets. Stabilization involves the adjust of water quality parameters such as pH, carbonate, and alkalinity and/or the addition of corrosion inhibitors. These are just some of the treatment processes employed in the production of drinking water; many additional treatment possesses are also employed in Florida, including reverse osmosis, ion exchange, nanofiltration, ultraviolet disinfection, and ozonation.

Water Security

Water tower in Plant City, Hillsborough County.

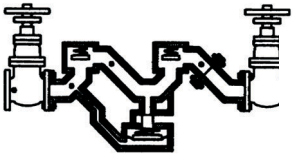
DEP's Drinking Water Program also helps ensure that customers have safe, high quality drinking water by requiring public water systems to implement security measures. The Bioterrorism Act of 2002 required public water systems serving more than 3,300 people to develop Vulnerability Assessments. A Vulnerability Assessment identifies a system's potential weaknesses and helps the system prioritize actions – security upgrades, operational changes, policy changes – that can eliminate or lessen the impact of the identified risks. The Drinking Water Program requires that systems serving more than 350 people also develop an Emergency Response Plan. An Emergency Response Plan outlines steps for immediate action to protect life and health for emergencies affecting staff, customers, or the treatment plant itself. It contains disaster specific plans to prevent or mitigate impacts from disasters including vandalism or sabotage, drought, hurricane, fire, and hazardous material release. To ensure that situations affecting the water supply are identified and addressed quickly, systems are also required to report security breaches and suspicious incidents to the State Warning Point – a central contact point for communications between local, state, and federal governments and emergency agencies. In addition to the safety-based regulations it has adopted, the Drinking Water Program works with other government agencies and non-government organizations to promote drinking water security and emergency preparedness. Through these partnerships, DEP funds, supports, and participates in water facility security and emergency preparedness training and "utility-helping-utility" support organizations such as FlaWARN.



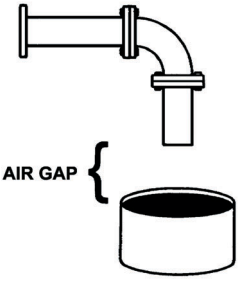
Cross-Connection and Backflow

Through regulation and public education, the Drinking Water Program is addressing the health threat posed by cross-connection and backflow. While water generally only moves in one direction through the water


Double check valve assembly outside an office complex in Tallahassee, Leon County.



REDUCED PRESSURE
PRINCIPLE ASSEMBLY



DOUBLE CHECK
VALVE ASSEMBLY

distribution system – from the water treatment plant to a tap – it is capable of moving in the opposite direction as backflow through unprotected cross-connections. Cross-connections are links between the drinking water system and another, potentially contaminated, source of water. Backflow can occur under two hydraulic conditions:

- Backsiphonage – where potentially unsafe water is pulled through a cross-connection into the drinking water distribution system due to a drop in pressure within the distribution system, or

- Backpressure – where potentially unsafe water under high pressure is pushed through a cross-connection and into the drinking water distribution system

Drops in pressure in the distribution system may result from water main breaks, maintenance or disruptions at the water treatment plant, or from high water demand (such as to fight fires). Booster pumps and elevated plumbing may increase the pressure of a compromised water supply over that in the distribution system. There are many opportunities for cross-connections on commercial, industrial, and residential properties.

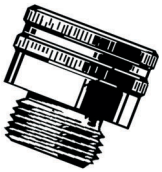
To help ensure the safety and quality of our drinking water, the Drinking Water Program prohibits cross-connections and requires community water systems to develop backflow prevention programs. Education is often a key component of these programs because people may be unaware of both the potential for unprotected cross-connections to be created and the health hazards they pose.

Common cross-connections at home include:

- a garden hose submerged in a bucket, sink, pond, swimming pool, or car radiator

- a chemical applicator attached to a hose

- improperly installed:
  - toilet tank fill assemblies
  - auxiliary water systems
  - irrigation sprinkler systems
  - fire sprinkler systems
  - water softeners
  - swimming pools



HOSE BIBB
VACUUM BREAKER

Under DEP's rules, if a cross-connection is discovered or there exists significant opportunity for a cross-connection to exist, either a backflow prevention device must be installed or service must be discontinued to that site. Water suppliers usually do not have the authority or capability to repeatedly inspect every consumer's premises for cross-connections and backflow protection. Instead, they protect the water supply by requiring that a proper backflow prevention device is installed and maintained at the water service connection to each site that poses a significant hazard to their water system. In addition to state law, local jurisdictions typically have provisions addressing cross-connection and backflow.

Water storage tanks at the Peace River Regional Water Treatment Plant in DeSoto County.

A Holistic Approach

In addition to the work done by the Drinking Water Program through the promulgation, implementation, and enforcement of its rules, a number of other organizations also play an important role in ensuring that customers receive safe, secure drinking water. The U.S. Environmental Protection Agency, the Centers for Disease Control and Prevention, the American Water Works Association, Florida's Water Management Districts, the Florida Department of Health, the Florida Public Service Commission, the Florida Water and Pollution Control Operators Association, Florida Rural Water Association, and the Florida Fish and Wildlife Conservation Commission all help protect our water resources. At DEP, many programs under the Division of Water Resource Management, as well as programs under the Division of Air Resource Management and the Division of Waste Management, work with the Drinking Water Program to provide you with safe, high quality drinking water.

The Drinking Water Program is housed within DEP's Bureau of Water Facilities Regulation. Drinking water related programs within the Bureau of Water Facilities Funding include:

- The Drinking Water State Revolving Fund Program provides low-interest loans to eligible entities for the planning, designing, and constructing of public water systems. Loan repayments, together with federal and state appropriations, fund the program.

- The Water Supply Restoration Program provides aid in restoring or replacing systems contaminated with pollutants to qualified owners of public water systems and private wells.

- The Operator Certification Program licenses the operators of drinking water and wastewater treatment plants.

For more information on the programs under the Bureau of Water Facilities Funding, visit www.dep.state.fl.us/water/wff. Learn more about DEP's mission and program accomplishments by visiting www.dep.state.fl.us.

How You Can Help

Your own actions can have a big impact on the safety and quality of our drinking water. There are many things you can do to help protect our drinking water supplies.

Take care with toxic or hazardous materials to keep them from getting into our water supplies. Improperly disposing of these chemicals by releasing them onto the soil, into septic systems, or into the sewer system could cause contamination of nearby drinking water supplies. Contact your public works department to learn how to properly dispose of these materials.

Even areas that usually have plentiful supplies of drinking water periodically face shortages due to drought. Help reduce demand by making water conservation a regular part of your daily routine by installing low-flow fixtures, fixing leaky toilets and faucets promptly, and reporting leaks in your system's distribution system to your city's public works department or water supplier.

Help prevent contamination of water resources, and prolong the life of your septic system, by having your septic tank inspected regularly and cleaned out when necessary, typically every three to five years. Contact your county health department for more information.

Protect your family and neighbors from health hazards by protecting your water supply from backflow contamination. Install simple, inexpensive hose bibb vacuum breakers on all spigots. Before starting a plumbing project, find out if a permit is required and always make sure the plumbing will be in compliance with the plumbing code. Contact your water provider for cross-connection control and backflow prevention requirements in your area.

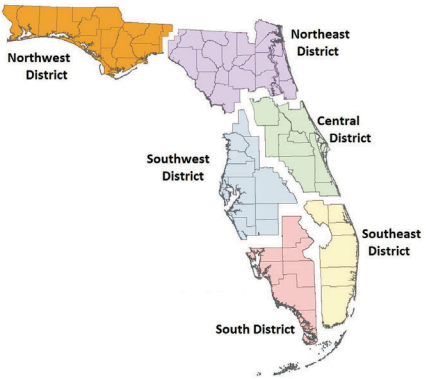
Protect your water supply and stop polluters by reporting environmental crimes and suspicious activities at drinking water treatment plants and water towers to the your local police department and the State Warning Point (1-800-320-0519).

Provide safe drinking water yourself by becoming a drinking water treatment plant operator. Contact DEP's Operator Certification Program at (850) 245-7500 to learn more.

Contacts

If you have specific questions regarding the quality or safety of your drinking water, contact your water supplier (or consult the annual water quality report – Consumer Confidence Report (CCR) – your system mails out every July) or contact the DEP Drinking Water Program in your district.

Northwest District (850) 595-8300
Northeast District (904) 807-3300
Central District (407) 894-7555
Southeast District (561) 681-6600
South District (239) 332-6975
Southwest District (813) 632-7600



If you have questions about very small water systems that do not fall under the Safe Drinking Water Act or would like to find a laboratory to carry out water quality tests, contact the Florida Department of Health.

If you have questions about installing a well or obtaining a water use permit, contact your regional water management district.

If you have questions about bottled water, contact the Department of Agriculture and Consumer Services, Division of Food Safety.

Hopefully you now have a better idea of what's entailed in producing Florida's high quality drinking water. To learn more about current drinking water issues, visit DEP's drinking water website at www.dep.state.fl.us/water/drinkingwater.

DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA