

Detailed septic system information can be accessed at both RIDEM and URI websites.

And thanks to....

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New England Grassroots Environment Fund
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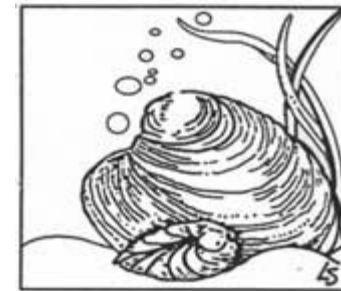
URI Cooperative Extension
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Rhode Island Rivers Council
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Caring for Your Septic System



A Homeowner's Manual 2009 update

The Mission/ Purpose

The purpose of this booklet is to ensure that the environmental quality of the Kickemuit River, Mount Hope Bay, and Narragansett Bay are protected from the effects of human activity.

Hopefully, this booklet will increase our citizen's knowledge of the importance of proper maintenance of septic systems, benefiting a healthy home environment, our drinking water, groundwater, rivers and bays.

Acknowledgements:

Roger Williams University
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PART V: ALTERNATIVE CLEANING RECIPIES

Try these cleaning recipes to help prolong the life of your septic system:

- Tub and Sink Cleaner: use baking soda in place of scouring powder. Sprinkle it on porcelain fixtures and rub with a wet rag. Rinse well.
- Toilet Bowl Cleaner: sprinkle baking soda and a couple of drops of soap inside the bowl as you would any scouring powder.
- Window & Mirror Cleaner: put 1/4 cup vinegar in the spray bottle and fill to top with water. Spray on surface. For outdoor windows, add a few drops of castile soap and wash with warm water.
- All Purpose Cleaner: use a drop of castile soap in place of other all purpose cleaners.
- Linoleum Floor Cleaner: mop with a mixture of 1/2 cup vinegar in a bucket of warm water. The vinegar odor will disappear when the floor dries.
- Drain Cleaner: to free minor clogs and help prevent future ones, pour 1/2 cup of baking soda down the drain first, followed by 1/2 cup vinegar. Let the mixture fizz for a few minutes, then add a teakettle full of boiling water.

Sources of Information

Rhode Island Department of Environmental Management's *Rules Establishing Minimum Standards Relating to Location, Design, Construction, and Maintenance of Onsite Wastewater Treatment Systems*. Available at the RIDEM website: www.dem.ri.gov.

URI Fact Sheets. Available at: www.uri.edu/ce/wq

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INTRODUCTION

The information in this booklet was originally prepared as part of Save The Bay's Aquidneck Island Project. Utilizing input from RIDEM, this booklet (2009 update) contains information on how septic systems work, how to keep them operating properly, why they fail, and how to identify and solve problems. Information on general water conservation, an outline of the septic system permit approval process and a selected bibliography are also included.

Failed septic systems cause water pollution, close Rhode Island shell fishing areas, contaminate wells, and pose threats to human health. We hope that you will follow the advice in this booklet and keep your system working well.

The booklet will be made available for organizations to use and distribute for the purpose of pollution prevention.

IMPORTANT PHONE NUMBERS:

Once you are finished reading the booklet, if you still have any questions or would like more information about septic systems, please contact

The RI Department of Environmental Management
Office of Water Resources, Permitting Section
Onsite Program
235 Promenade St.
Providence, RI 02908
(401) 222-4700
www.dem.ri.gov

URI Cooperative Extension
Water Quality Program
Onsite Wastewater Training Center
Coastal Institute in Kingston
001 Greenhouse Rd.
Kingston, RI 02881
401-874-2026
www.uri.edu/ce/wq

Additional contact information can be found on the back of this brochure.

Q. How large should my septic system be?

A. The size of a new septic tank and leachfield is established by state regulations and determined by the size of the house and the soil conditions on the site.

The leachfield may range in size, depending on the soil characteristics and depth to the water table. The lower the permeability of the soil, the larger the size of the leachfield. Other site characteristics, such as slopes, depth to bedrock, and setback from surface water must be considered for appropriate design and location of the septic system.

Q. What about the installation process?

A. All OWTS installations must be performed by DEM licensed or approved installers. The installation is not considered complete and ready for use until the licensed designer certifies as to its completion to DEM and DEM issues a conformance certification.

Q. Can I install an alternative system?

A. Yes. As of 1996, alternative or experimental septic systems are approved for use in Rhode Island. Please contact DEM at 222-4700 for more information. For a list of RIDEM's approved alternative wastewater treatment systems visit the RIDEM website: www.ri.dem.gov.

The University of Rhode Island has an On-site Wastewater Training center at Peckham Farm, in Kingston, featuring many low cost, innovative ways to make septic systems more efficient. From time to time training courses are offered that are open to the public. For more information call: 874-5950.

PART IV: THE PERMITTING PROCESS

Under state law and regulation, onsite wastewater treatment systems (OWTS) cannot be installed, altered, or repaired without prior approval by DEM. Detailed information can be obtained by calling DEM at 222-4700.

Q. Why does DEM require approval?
A. Permits are required to assure the adequate design and proper functioning of all onsite wastewater treatment systems required by law. The intent is to protect public health and private water supplies as well as local streams and rivers.

Q. What is the application process and how long does it take?
A. DEM requires four copies of a detailed plan for a proposed OWTS. Applications must be prepared by a licensed designer; a list of designers is available on DEM's website: www.dem.ri.gov. Plans should be drawn to scale showing all the components, important setback distances, elevations and construction standards.

Review of repair applications take approximately 4-5 days. Review of new building applications will take longer, depending on DEM staffing, the site conditions and the complexity of the proposed project. More complicated projects on constrained lots can take a month or more.

Q. What soil tests are required?
A. While the status of the water table is often determined by examining soil features during the soil evaluation, for new systems and alterations to existing systems a 'wet season' soil test can sometimes be used. Test pits are dug by backhoe, and DEM licensed soil evaluators use information from these pits to determine the depth to the water table and bedrock, and the soils ability to accept and transmit effluent. Occasionally, the depth to the water table is determined by reading the depth to the water in a perforated pipe backfilled in the soil test pit.

Mrs. Johnson's Septic System Blues

Peggy Johnson was puzzled. Every time a member of the family took a shower, the water drained slowly out of the tub and the sink gurgled. There was also a noticeable smell of sewage in the basement. Peggy and her family had lived in this house for 12 years and there had never been any problems with the plumbing before.

Ralph Martin, the next door neighbor, told her that the problem was the septic system and she needed only to add some yeast to the tank. That didn't work. Mrs. Vincent, from across the street, suggested she try a special septic tank additive sold at the local hardware store, but the troubles continued.

Finally, Peggy got in touch with a local septic tank pumper. When the driver, Mr. Kelly, arrived in the pump truck, he asked Mrs. Johnson how long it had been since the system was last pumped. "Never," Peggy replied proudly, "This is the first time I have ever had a problem."

After pumping and inspecting the tank, Mr. Kelly had some bad news.

"Your leachfield is plugged beyond repair and is going to have to be replaced. That will cost you between \$5,000 and \$10,000." Peggy was stunned. Her home insurance wouldn't cover a cent.

"I was told this system would last 30 years before it needed replacement."

"Well, under normal conditions and with proper maintenance, it should have," replied Kelly, "but because you never had it pumped out, all the sludge that built up in the tank spilled out into the leachfield and clogged it prematurely. If you had taken better care of your system it might have lasted longer."

Peggy Johnson's problem is one shared by many homeowners who have septic systems. People often find themselves with messy and expensive problems for two reasons: they may not know that they are hooked up to a septic system, and they don't know how a septic system works.

To help explain how septic systems work and how to keep them working properly, we developed this booklet. By encouraging better management of septic systems, we hope to prevent and reduce the problems and failures that can lead to health and pollution hazards. To avoid Mrs. Johnson's woes, read on.

PART I. THE WHO, WHAT, WHERE AND HOW OF SEPTIC SYSTEMS

Q. What is a septic system?

A. Where municipal sewer systems are not available or practical, a septic system is the only safe and approved method of disposing for household wastewater.

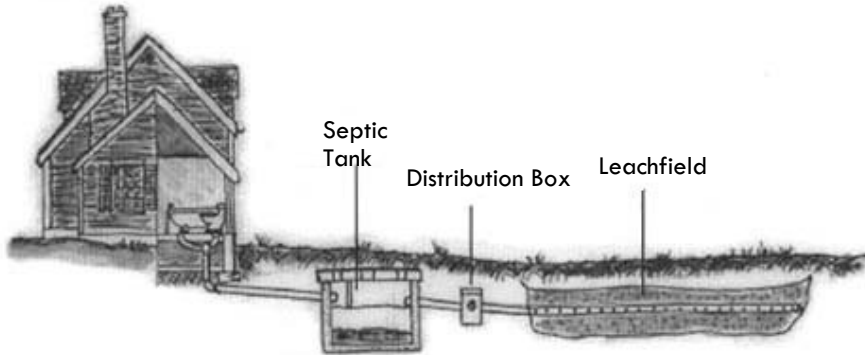


Figure 1. Typical Layout of A Septic System

The system usually consists of a septic tank, distribution box and leachfield. Older systems (pre -1968) are probably cesspools. All components of a typical system are installed underground (see Fig. 1). An access manhole is always installed on the top of the septic tank or cesspool so septage can be pumped out periodically. The access manhole is usually at or near ground level and is typically easy to locate.

The **septic tank** is a concrete, metal or fiberglass box, usually with a capacity of about 1,000 to 1,500 gallons, depending upon the number of bedrooms in your house. Some older tanks may be as small as 500 gallons.

CURES: WHAT TO DO WITH A MALFUNCTIONING SEPTIC SYSTEM

- Call a licensed septic system construction contractor to inspect and evaluate the system. Repairing it may be necessary.
- Consider replacing the system. Although an expensive proposition at first glance, the headaches and problems it solves in the long run are worth the investment. If an initial investment was not made in a new septic system, it may be time for an upgrade.
- If you are having a new system installed, check to see whether the contractor responsible for the construction is bonded and insured.

Note:

The Most Important Cure For System Failure Is Prevention

TROUBLESHOOTING PROBLEMS AND LIKELY CAUSES

Problem:	Most Likely Cause:
Lush growth of grass and/or wet spot in the leachfield area.	<ul style="list-style-type: none"> ⇒ Leachfield in poorly drained or unsuitable soil ⇒ Leachfield improperly installed ⇒ Leachfield partially blocked by solids ⇒ One or more distribution pipes is crushed or tipped out of alignment
Lush growth of grass and/or wet spot around the septic tank.	<ul style="list-style-type: none"> ⇒ Tank needs cleaning or servicing ⇒ Obstruction in outlet pipe to the distribution box ⇒ Improperly designed tank or the tank is too small
Wastewater drains slowly or backs up in one or more household drains.	<ul style="list-style-type: none"> ⇒ Obstruction in individual fixture or trap ⇒ Obstruction in sewer pipe from the house to the septic tank ⇒ Leachfield not operating properly

The **distribution box** is a concrete box with several pipes branching out of it. One pipe arrives from the septic tank and two or more leave to distribute the 'clear' wastewater (called effluent) into the leachfield.

The leachfield usually consists of perforated pipes surrounded by crushed stone.

Q. What is the difference between a septic system and a cesspool?

A. A cesspool is a perforated tank that receives sewage and directly discharges the liquid portion into the ground. Cesspools provide for less treatment than a septic system and are prone to failure. Many cesspools are made of cement or brick, but in some cases are merely a 55 gallon drum with holes punched in the sides. The soil pores surrounding the cesspool gradually clog with organic solids and the cesspool overflows, potentially contaminating water resources and wells. A system installed before 1968 is most likely a cesspool. **Cesspool installation has not been permitted in Rhode Island since 1968.**

WHO?

- Q. Do I own a septic system or cesspool?
- A. Most households in Bristol are connected to the municipal sewer system, but if you are not assessed a sewer use fee, chances are your home relies on a septic system to treat and dispose of household wastewater. If you receive a bill for sewer service, you are probably tied into a sewer system. The local building inspector will have records of sewer connections. But the best way to find out is to look for one in your yard.

WHERE?

- Q. Where is my septic system?
- A. After you establish that you own a septic system, find out where it is. A good place to start is the Department of Environmental Management's Office of Water Resources Permitting Section/ Onsite Program (RIDEM). If your system was installed or repaired after April 1968, DEM should have a copy of the plans on file. DEM reviews all septic system plans to assure compliance with state health and environmental regulations.

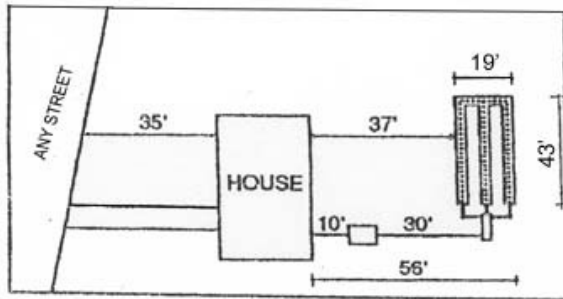


Figure 3. Location of a septic system

It also issues repair and construction permits. Call them at 222- 4700, or visit at 235 Promenade Street in Providence. If you are putting in a new system, keep a copy of the plans approved by DEM. If you move, be sure to give them to the new owners. Another place to check is your local building official. For more information refer to Septic System Checkup at <http://www.dem.ri.gov/programs/benviron/water/permits/isds/index.htm>

If there are no records, look for the access manhole. Sometimes they are buried under lawns and difficult to find. If you cannot find the manhole, a septic tank pumper should be able to find it. Once the manhole is found, it is a good idea to extend the manhole to ground level. Also map the location of the manhole.

PART III. SEPTIC SYSTEM FAILURE

When, a septic system stops functioning properly, it is considered to be a "failed" system.

- Q .What are some signs of septic system failure?
- A. Sewage backs up into the house, causing slow draining sinks, tubs, or basins. A strong odor of sewage may be present. Also, lush growth, muddy soil, foul smells and/or unexplained surface water is evident around the septic tank manhole or over the leachfield in your yard.
- Q .Why does a septic system fail?
- A. Septic systems fail for a variety of reasons. Some of the more common reasons include:
- Poor maintenance/improper care-** Insufficient pumping may cause sludge and/or scum to spill over into the leachfield, clogging the soil.
- Unsuitable location-** A system in an area of high ground water or in soil that drains too slowly will have a shorter life span.
- System overload-** Converted summer residences and houses with added bedrooms produce too much sewage for the capacity of an existing system.
- Design or Installation-** A system may originally have been designed or installed improperly resulting in a shorter service life.
- Advanced age-** A properly designed, installed, and maintained septic system can last indefinitely. However, older systems are more likely to fail because there is more time for potential mismanagement to occur.

OTHER IMPORTANT DO'S AND DON'TS:

- **Keep motor vehicles off of the septic system area. Their weight could crush or break pipes and lead to expensive repairs.**
- **For the same reason, do not place an above ground swimming pool over the septic system.**
- **Do not place patios, driveways, playgrounds or other impervious surfaces over a leachfield.**
- **Surface runoff from driveways, sidewalks and roofs should be kept away from the leachfield to prevent flooding.**
- **Do not plant trees near the leachfield - the roots can plug the perforated pipes.**
- **Never connect any other drain or pump, such as a basement sump pump, into the septic system.**
- **Use single ply, white toilet tissue. It decomposes best in septic systems. Fragrant and dyed toilet tissues contain substances that can disturb the bacteria in the system.**
- **Although most household cleaners do not contain phosphates, they do contain ammonia, bleach, or other chemicals that could be toxic to a septic system's cleansing bacteria. Use them sparingly, if at all.**
- **Use a phosphate-free dishwasher detergent.**
- **Use liquid laundry detergents that are free of dyes and perfumes, and do not contain significant levels of phosphorous or phosphates.**

If the access manhole is not visible at ground level, go into the basement and determine what direction the sewer pipe leaves the house. Check the lawn in that area for unusually lush grass, bare spots, areas where snow melts first, or for slight depressions or mounds. Carefully probe any suspected area with a crowbar or thin metal rod. After you locate the septic system, draw a small map in this manual. Use two corners of the house as starting points and measure out to the access manhole (see Figure 3).

HOW?

Q . How does a septic system work?

A. Inside the septic tank, wastewater settles and is separated into three layers: the scum layer on top, made up of greases and other floating substances; the liquid layer in the middle; and the sludge layer at the bottom, formed by the heaviest components of the sewage (see Figure 4).

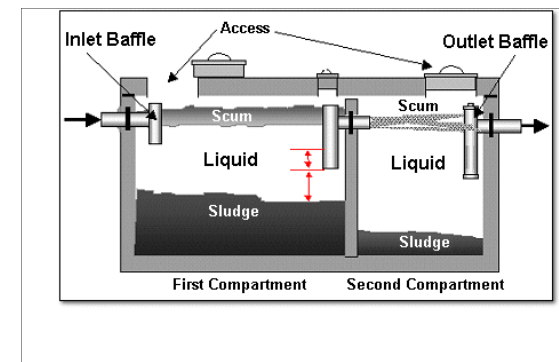


Figure 4. Inside a Septic Tank

The liquid middle layer or "clear" wastewater flows through the outlet pipe into the distribution box and on to the leachfield. The leachfield then spreads the water over an area where it is filtered through the crushed stone and eventually into the soil. Once in the soil, the wastewater is further purified by aerobic (oxygen dependent) bacteria and by the soil's natural filtration.

Q . Do additives help?

A. No. Although about 1,200 products are on the market for use in septic tanks, research shows that use of these products, including common yeast, does not significantly improve system function on a long-term basis. The state prohibits the use of chemical and organic solvent cleaners in septic systems. These chemical cleaners may contaminate underground water supplies used for drinking water.

Homeowner Alert

The use of chemical additives in septic systems is prohibited by the state. Even though some companies still advertise and sell these types of products, they are outlawed.

MANAGING WHAT GOES DOWN THE DRAIN.....

Septic systems will not function properly if household hazardous wastes and toxins are disposed in them. The reason: the micro-organisms that keep septic systems working are easily disturbed. To avoid septic system failure and groundwater contamination, never dump the following down your drain:

- **Toxic wastes, such as paint, paint thinners and drain cleaners**
- **Pesticides, acids, spot removers, solvents and furniture polish**
- **Paper towels, facial tissues, sanitary napkins, cigar or cigarette butts**
- **Cooking fats or grease**
- **Disposable diapers**
- **Automobile or engine oil**
- **Disinfectants, syringes**
- **Medicines, especially antibiotics**
- **Condoms, tampon applicators (even if they are cardboard)**

The Rhode Island Department of Environmental Management (DEM) has a household hazardous waste collection program. Bristol also has a permanent spot (igloo) for disposal of waste oil at the transfer station on Mintern Farm Road..

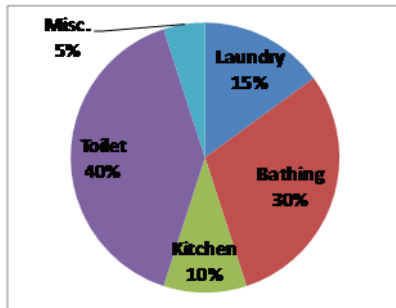
.....AND THE GARBAGE DISPOSAL

Excessive organic material introduced into a septic system by a garbage disposal can turn it into a very expensive kitchen appliance if it causes a septic system's premature failure. Consider reducing the amount of garbage you dispose of down the drain. Most vegetable scraps and non-animal food wastes can be safely composted. Never put coffee grounds or egg shells in a garbage disposal, they will clog the system.

Never pour hazardous products like battery acid and paint thinner down the drain or dispose of them in the trash. Call DEM at 222-4700 or Bristol's Department of Public Works at (401) 253-4100 for more information.

Similarly, every minute spent in the shower translates to 5 to 10 gallons of wasted water.

Third priority: Install water saving devices. Without changing your lifestyle, you can cut water consumption by 10 to 20 percent. Pure and uncontaminated drinking water is a precious and threatened resource. It is also increasingly expensive. Water conservation practices will help prolong the life of your septic system and will save you money. Homeowners can install several water-saving devices.



Faucet Aerators: Aerators reduce a faucet's flow by up to 75 percent. Most of these aerators are inexpensive and easy to install.

Toilet Flush Dam: A toilet consumes 40 percent of household water. Toilet dams can be used to

upgrade an existing toilet and reduce the number of gallons per flush from five to three.

Water Saving Toilets: These shallow-trap toilets use only 1 1/2 gallons of water per flush compared with a conventional toilet which can use up to 5 gallons per flush. Newer models use even less water, as little as one quart. A new toilet should be installed by a licensed plumber to ensure that it functions properly.

Low-flow Showerheads: Showers consume over 30 percent of water used in a house. Low-flow showerheads actually provide just as much cleansing and relaxation power as the old, 10 gallon-per-minute models. Low-flow showerheads use less than 2 gallons minute.

PART II. GENERAL INSPECTION AND MAINTENANCE TIPS

By following the simple steps below, you can avoid system failure and prolong the life of your septic system. Water conservation, regular pumping, managing what goes into the system, and better care of the system will repay you with more years of reliable and safe service.

PLUMBING AND INSPECTION

Q. Why should a septic tank or cesspool be pumped?

A. Most residential septic tanks are designed to hold between 1,000 and 1,500 gallons. Some constituents of household wastewater are not biodegradable. These nonbiodegradable elements end up being stored in the septic tank as sludge and scum. Over time, the sludge and scum build up and cause the system to fail. Pumping is essential to prevent these solids from flowing into and clogging the leachfield. Sludge accumulating at the bottom of the tank should be removed before it rises more than one third the distance to the outlet pipe. Cesspools should be inspected and pumped once a year, especially for households that have garbage disposals. Septic tanks should be pumped on a three to five year basis.



Q. Should I install tank access risers?

A. Yes. Septic tank risers provide easy access to the septic tank. Without a riser, the tank must be unearthed for every inspection or pump out. With risers, little or no digging is needed, potentially reducing the cost of the pump out.

Q. Should I inspect my tank?

A. No. Ask a professional to perform an inspection. Maintenance and functional inspections are typically performed by wastewater professionals. The maintenance inspection determines the need for pumping and to ensure proper function. A functional inspection is used to determine whether a system is adequate to serve the wastewater needs of the household. A list of trained inspectors is available at: www.uri.edu/ce/wq/owt/inspectors/index.htm.

- Q. Should the tank walls be washed down after pumping?
- A. It makes no difference whether the walls are washed down. The residue that remains on the side of the walls does not negatively affect the function of the septic system.
- Q. How much does it cost to have a septic tank pumped?
- A. Prices vary. Pumpers usually charge about \$200 to \$250 dollars to pump out a residential tank. Pumping charges, like everything else, are not going down. Don't wait for a price war to break before having your tank pumped, but still shop for the best price.
- Q. Should I install effluent filters?
- A. Yes. Effluent filters attach at the outlet of the septic tank. Filters are an easy and inexpensive way to capture particles that could potentially clog the system. For more maintenance tips, please visit the DEM or URI websites.

NOTE- An increasing number of municipalities now require mandatory septic system inspections.

NOTE- Never climb down into an open septic tank; potentially fatal sewer gases may be present. Never leave the manhole cover off the tank when no one is present.



If you live in Bristol, you may qualify for a partial reimbursement for septic system pump outs. Call Bristol Water Pollution Control at (401) 253-8877

WATER CONSERVATION

Over 95 percent of the waste entering a septic system is water. Reducing the flow of water into the septic tank is one of the easiest and least expensive ways to extend the life of a septic system. Excess water flowing into the tank hampers solids and grease from settling out of the wastewater. The bacteria in the septic tank work on a gradual basis and the longer that the wastewater remains in the tank, the better it is treated.

Q. How can I save water?

A. First priority: Check for leaks. Leaks account for between 5 and 10 percent of all residential water consumption. A leaky faucet wastes more water than most people realize. A leak of one drop per second can waste 7 gallons per day and a steady drip will waste 20 gallons every day.

Leaky faucets are easily repaired. Installing a new washer usually corrects the leak. Washers are available at most hardware stores and usually come with instructions on how to replace them. When in doubt, call an expert.



A leaky toilet can waste thousands of gallons every year and is usually silent, making it difficult to detect. To find toilet leaks, drop food coloring into the tank. If, without flushing, the color appears in the bowl, there is a leak that should be repaired immediately.

B. Second priority: Use water saving habits. Water consumed by washing machines (15 to 50 gallons) and dishwashers (4 to 16 gallons) will be put to better use if you have a full load before starting the machine. Don't leave the water running while brushing your teeth or shaving. When hand-washing dishes or cleaning vegetables, use a stopped sink or a pan of clean water instead of running the faucet. For every minute water runs unused from your tap, several gallons can be wasted.