

PRACTICE GOOD WATER-USE HABITS

Kitchen

- Run the dishwasher with a full load to save water, energy, detergent, and money.
- Use the dishwasher's short wash cycle if your dishes are only lightly soiled.
- Dry scrape dishes instead of rinsing them and do not pre-rinse dishes if you are using the dishwasher.
- Fill a basin or the sink with soapy water instead of letting the water run continuously when washing dishes by hand. Soak pans rather than scrubbing them while the water is running.
- Rinse produce in a pan of cold water instead of letting the water run.
- Transfer frozen foods to the refrigerator to defrost the night before you need them instead of letting water run over them.
- Keep a container of water in the refrigerator rather than running tap water until it is cool enough to drink.
- Limit the use of garbage disposals and consider composting.

Laundry room

- Wash only full loads.
- Match the load setting with the amount of laundry to be washed if you must wash partial loads.
- Use the shortest wash cycle for lightly soiled loads as it uses less water than other cycles.

Bathroom

- Don't use your toilet as a trash can for paper and facial tissues.
- Turn the water off when you aren't using it.
- Run water just to wet and rinse the toothbrush instead of allowing the water to run while brushing your teeth.
- Apply the same idea when washing your hands.
- Use only as much water as you really need.
- Take shorter showers instead of a bath.
- Use water-efficient showerheads, which often use less water than a bath.
- Turn off the water while you are shampooing your hair.



Texas Water Development Board

www.twdb.state.tx.us

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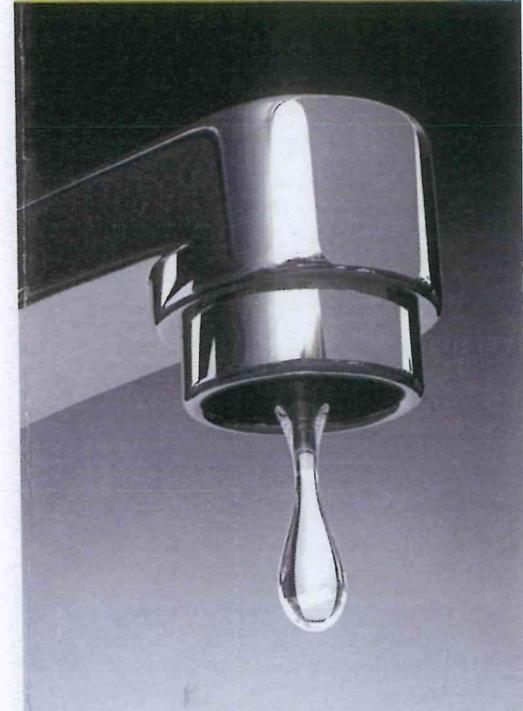
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WATER IQ
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Visit the following Web site for additional information.

www.epa.gov/watersense

CONSERVING WATER INDOORS



YOU CAN EASILY SAVE a minimum of 20 gallons per day just by installing water-efficient fixtures and reducing leaks.

Per capita water use in Texas averages 164 gallons per person per day. By adopting water-saving measures, you can reduce that amount and save money. Making a habit of conservation makes sense. It protects the water resources of both current and future Texans.

INSTALL WATER-EFFICIENT APPLIANCES

Toilets: Toilets are by far the main source of water use in the home, accounting for approximately 30 percent of indoor water use. They also happen to be a major source of leaks and/or inefficiency. Under state and federal law, toilets must not exceed 1.6 gallons per flush. High-efficiency toilets (HETs) go beyond that standard and use less than 1.3 gallons per flush.

- Over the course of your lifetime, you will likely flush the toilet nearly 140,000 times. If you install a high-efficiency toilet, you can save 4,000 gallons per year.
- Many local utilities offer rebates to replace old toilets.
- Toilets are the single largest water user in a home. A leaky toilet can waste 200 gallons of water per day, and it is estimated that nearly 20 percent of all toilets leak.

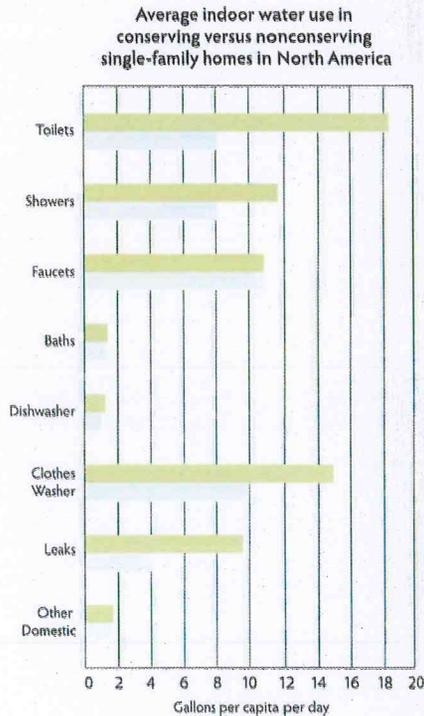
To determine if the toilet is leaking, take these steps:

- Remove the tank lid after the tank has stopped filling.
- Check for a visible leak or to hear water running.

To find other, less obvious leaks, perform the following test:

- Mix a few drops of food coloring or place a dye capsule or tablet (available from home improvement centers and many utilities) into the water in the toilet tank.
- Do not flush the toilet.
- Wait about 10 minutes and if the dye appears in the toilet bowl, the toilet has a silent leak.

Check toilet parts regularly. Replace worn parts with good quality parts as necessary, and retest to make sure the leak has been fixed.



The average indoor use in a conserving North American single-family home is 45.2 gallons per capita per day, and in a nonconserving home it is 69.3 gallons per capita per day.

Source: Handbook of Water Use and Conservation, 2001.

Showers: Take shorter showers. A 5-minute shower uses only 10–25 gallons. A full bathtub, however, can require up to 70 gallons of water.

Installing a water efficient showerhead is one of the single most effective water-saving steps you can take inside your home.

Sinks: Installing faucet aerators on sinks is a simple, cost-effective way to save water. The faucet's efficiency can double without sacrificing performance. Aerators are inexpensive and do not require special adapters.

Faucet leaks are usually caused by worn washers or "O" rings (for a washerless faucet), which are inexpensive and easily replaced. Note the faucet brand and take the original part with you to a home improvement center.

Washing Machines: When buying a washer, look for a high-efficiency model that has adjustable water levels for different load sizes. High-efficiency washers use 35 to 55 percent less water and 50 percent less energy. They also require less detergent, rinse more thoroughly, are less abrasive on clothes, and can fit larger capacity loads in the same size drum.

Dishwashers: High-efficiency dishwashers use a maximum of 7 gallons per load, but some use as little as 4.5 gallons. Replacing an older model with a water-efficient model could cut dishwasher water use in half. Look for energy efficiency features to cut costs even more.

DON'T WAIT TO FIX LEAKS!

Leaks could account for 10 percent or more of your water bill and waste both water and energy.

The water meter can be used to check for invisible or unnoticed leaks.

- Turn off all faucets and water-using appliances.
- Read the dial on the water meter and record the reading. (It is often located along the property line near the street.)
- Recheck the meter after 15 to 20 minutes.

If no water has been used and the reading has changed, a leak is occurring somewhere in the plumbing system. The services of a plumber or trained water utility employee are often required to locate and fix these invisible leaks.



WATER-WISE IRRIGATION EQUIPMENT

What is the most efficient irrigation system for nonturf areas?

Drip irrigation. It is the most efficient method of watering bedded plants, trees, or shrubs. Soaker hoses are an easy and inexpensive alternative to drip irrigation.

What type of sprinkler should I use for the lawn?

One that produces large drops of water close to the ground. Don't use a sprinkler that produces a mist or fine spray. Use a timer so you don't forget to turn the sprinkler off.

How should I manage my automatic sprinkler system for water efficiency?

Adjust the settings as needed. Don't just set it in the spring and leave it on all season. Automatic sprinkler systems provide an efficient method of watering lawns. Their controllers use timers to turn off the system when a measured amount of water is used, and rain shut-off devices prevent watering in the rain.

Not all plants have the same watering requirements. Reduce the run time of sprinklers on shrubs, which may not need as much water as grass. Shady areas may not need as much water either. Contact a professional landscape irrigation specialist for a maintenance check.

What maintenance is required for my automatic sprinkler system?

Check sprinkler heads regularly. Remove dirt or debris that may be clogging the nozzle and make sure the heads are working at the proper pressure and not leaking.

Repair or replace broken heads, valves, seals, and pipes. Once a month, run the sprinklers for a short time on each cycle while you are at home to make sure they are working properly.

What features should I look for in an automatic sprinkler system?

Options that will help you save water. The controller of new sprinkler systems should have these features:

- a multiple scheduling option
- a rain shut-off device
- a water budget feature (which allows percentage adjustments without having to reprogram)
- test functions



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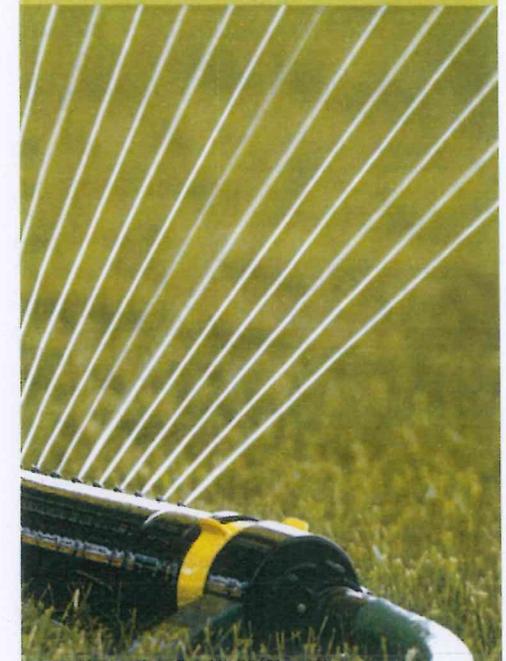
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CONSERVING WATER OUTDOORS



IN THE SUMMER, outdoor water use can account for 50 to 80 percent of home water use.

Texans must use their precious water resources more efficiently, or we will have longer, more frequent water shortages, especially during droughts and hot Texas summers. Much of the water used outdoors is wasted through inefficient landscape watering practices. By reducing the amount of water we waste, we will save money and protect the quality of life of future Texans.

WATER-WISE CONSERVATION STEPS

Many Texas water utilities charge higher rates during the summer or increase rates in increments based on use. Reducing your outdoor water use by following these steps can produce substantial savings in your water bill:

- Determine how much water your landscape needs to stay healthy.
- Use water-efficient landscape practices, such as proper mowing, mulching, and moderate fertilizing.
- Design a water-efficient landscape by planting drought-tolerant grass and choosing plants that are native or well adapted to the climate conditions in your area.

WATER-WISE LANDSCAPE

How often should I water?

Only when needed. One inch of water once a week should be sufficient to keep most Texas lawns healthy.

Proper watering will help grass and shrubs develop deep roots (it is especially important to start this during the spring when root growth is at its peak). Over-watered turf will have a short root system and will not be drought tolerant. By slowly adjusting to successively longer periods between waterings, the turf can grow deeper roots and become drought tolerant.

What time of day should I water?

Early morning or late evening during hot summer months. Otherwise, the water can simply evaporate between the sprinkler and grass.

What should I water?

Only your plants. Don't water the sidewalks and driveways. Use a broom to sweep debris away.

How can I use rainwater?

Harvest it. Funnel the water from your gutters into a barrel or cistern and save it for a sunny day. Rainwater is free and better for your plants because it doesn't contain hard minerals.

WATER-WISE LANDSCAPE MAINTENANCE

When should I mow?

Only when the grass is dry. And don't cut more than one-third of its length at one time. Taller grass holds moisture better, encourages deeper root growth, and is less susceptible to browning. Keep grass 3 inches tall during the summer (taller than 3 inches stresses the grass).

What should I do with my grass clippings?

Mulch or compost them. Grass clippings break down quickly and provide valuable nutrients.

How can I conserve soil moisture?

Use lots of mulch. It will make your shrubs and young trees more tolerant to the scorching Texas heat.

- 1 to 3 inches of mulch
 - retains moisture
 - reduces runoff
 - helps moderate soil temperatures
 - aids in root development
 - reduces erosion
 - slows weed growth
 - prevents soil compaction
 - makes your landscape beautiful

- Place mulch directly on the soil or weed barrier fabric that can "breathe." Avoid using sheet plastic in planting areas.
- Apply a thin layer of compost to the lawn. It functions like mulch, increases organic content, and protects grass roots.

What should I know about fertilizing?

Apply fertilizer in the spring and fall. It helps develop good root systems to keep your grass more drought tolerant.

Don't overfertilize because it can run off and pollute local waterways. Too much fertilizer will also increase the grass's need for water. Contact your County AgriLife Extension Service or local nursery professional for a soil kit and recommendations for fertilizer.

How else can I improve my landscape?

Improve the soil. If the soil is rocky, sandy, shallow, heavy clay, or has little organic matter, it can be improved by adding several inches of high quality loam soil and 2 to 3 inches of organic matter such as mulch or compost.

High quality soil helps reduce irrigation needs by retaining water better when added to sandy and clay soils. Unless the soil is damaged or depleted, native and well-adapted plants may not require imported soil. Aerate the lawn once a year. Weed the lawn and garden as needed. Weeds rob plants of valuable water.

How else can I minimize water use?

Don't forget your pools, spas, and fountains.

- Cover pools and spas when not in use to lessen evaporation.
- Backwash your filter only as necessary.

- Turn off decorative fountains on windy days and during drought.

DESIGN A WATER-WISE LANDSCAPE

Plant water-efficient, well-adapted, and/or native shrubs and trees. Bermuda, buffalo, and zoysia are drought-tolerant grasses. Choose plants that are drought tolerant (or at least have low water requirements) and heat tolerant and can survive the minimum winter temperatures in your local area. Native plants are also more resistant to diseases and pests.

Put drought-tolerant groundcover instead of grass in areas that are narrow, small, sloping, odd-shaped, or close to pavement. Limit turf areas to those needed for practical uses.

Contact your County AgriLife Extension Agent, your water-wise landscape professional, or your city or water supplier for recommendations of water-efficient plants that are adapted to your area of the state and additional information on efficient landscape water use.



CONSERVING WATER IS GOOD FOR BUSINESS

- American Airlines Maintenance Base in Fort Worth implemented a program to recycle water and minimize hazardous waste. They expanded a reverse-osmosis system to treat 40 million gallons of wastewater, converted an existing treated-effluent tank into a reverse-osmosis tank, and upgraded an outdated automation control system. The project reduced total water usage by 24 to 36 percent and reduced costs by almost \$1 million. In addition, the amount of hazardous waste in one year was reduced by more than 50 percent.
- Freescale in Austin uses Ultra Pure Water for manufacturing microchips. In order to save millions of gallons of wastewater and potable water, Freescale implements a rigorous reuse and recycling program. Since 2006, Freescale has reduced wastewater by more than 50 percent and reduced potable water by more than 51 percent. The high percentage of water savings comes from operational processes that reuse and recycle the



majority of process water. In 2007, Freescale saved more than 160 million gallons of water and more than 90 million gallons of wastewater through conservation efforts.

- The Frito-Lay plant in San Antonio has saved 1 billion gallons of water a year since implementing conservation efforts in 1999. Frito-Lay recycles the water used to make potato and corn snacks and has reduced fresh water use in these processes by 35 to 50 percent.

REASONS TO CONSERVE WATER

Will conserving water hinder business profitability? No. Conserving water can help increase profits. Some of the financial benefits to consider when evaluating water conservation are:

- Reduced costs**—water costs account for 1–2 percent of a business' overhead. Saving water can help reduce overhead costs.
- Increase in future water prices**—water prices are set to rise above inflation. Saving water now will reduce costs in the future.
- Production efficiency**—using water efficiently will make additional water available for future production.
- Tax benefits**—many government agencies and water utilities provide rebates, grants, and tax relief to encourage water conservation. Tax benefits keep money where it belongs, in your pocket.

In Texas, various tax exemptions can be given for:

- Rainwater harvesting systems
- Water recycling and reuse systems
- Desalinization systems
- Wastewater systems certified by the Texas Commission on Environmental Quality
- Brush control equipment designed to increase water availability

For more information about water conservation, contact your local water supplier or the Texas Water Development Board.

Sources:

- American Water Works Association, www.awwa.org.
- East Bay Municipal Utility District, 2008, *Watersmart* guidebook: Oakland, East Bay Municipal Utility District, 242 p.
- Seneviratne, M., 2007, *A practical approach to water conservation and industrial facilities*: Burlington, Mass., Butterworth-Heinemann, 380 p.
- Vickers, A., 2001, *Water use and conservation*: Amherst, Mass., Waterplow Press, 464 p.



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WATER CONSERVATION FOR INDUSTRIES, BUSINESSES, AND INSTITUTIONS



USING WATER EFFICIENTLY makes good business sense. With rising costs of operations for many businesses, conserving water is one way to cut costs without compromising products or services. Texas' soaring population and dwindling water supplies have prompted communities to begin conservation programs, many of which provide financial incentives to businesses that establish water-saving practices.

Numerous businesses in Texas have already instituted significant conservation measures. As a result, they have reaped both financial and environmental benefits, demonstrating that water conservation can improve the bottom line.

GETTING STARTED

Your first priority should be to perform a water audit of your building, including the grounds. Water audits vary from business to business and can range from simple to extensive. For information on performing a water audit for your business or institution, visit the TWDB Web site:

www.twdb.state.tx.us/assistance/conservation/Municipal/ici.asp

Information is also available on these Web sites:

Alliance for Water Efficiency

www.allianceforwaterefficiency.org/Water_Audit_Process_Introduction.aspx

American Water Works Association

www.awwa.org/Resources/WaterLossControl.cfm?ItemNumber=48055

WATER SAVER CHECKLIST

Choose water-efficient appliances to help reduce water use. Other suggestions on where water can be conserved are listed below.

Maintenance

- Sweep instead of using a hose
- Use a high-pressure nozzle when a hose is necessary
- Clean windows only when needed

Building Operations

- Check for and repair leaks
- Meter all major uses separately
- Read water meters regularly to track potential leaks
- Shut off water to unused areas
- Keep employees informed
- Use automatic shut-off valves for equipment that is not in operation
- Examine ways to modify processes
- Install self-closing, air-cooled water fountains
- Use gray water for irrigating landscape

Food Service

- Provide water only on request
- Thaw food in refrigerator or microwave
- Scrape dishes instead of rinsing
- Install high-pressure, low-volume spray washers
- Replace worn washers
- Wash full loads only
- Reuse final rinse water for prewash or garbage disposal
- Install dishwashers with automatic shut-off valves
- Use air-cooled or flake ice machines
- Don't use running water to melt ice

Laundries

- Wash full loads only
- Recycle final rinse water for pre-wash
- Install sub-meters to track potential leaks
- Recover steam condensate and/or vented flash steam

Process Use

- Eliminate once-through cooling
- Meter water use
- Recycle and reuse water
- Install automatic shut-off valves
- Use air-cooled systems
- Alter process filtering to maximize product recovery
- Separate water process streams

Restrooms

- Check for and repair leaks
- Remind users to conserve
- Retrofit older fixtures
- Install low-flow showerheads and faucets
- Install metered or sensor faucets
- Install high-efficiency toilets and waterless urinals
- Consider foam flush or waterless toilets

Vehicle Washing

- Wash vehicles only when needed
- Adjust solenoids, valves, nozzles, and equipment to minimize water use
- Use high-pressure washes
- Inspect and replace worn jets and parts
- Install water recycling equipment
- Consider waterless washing techniques

Cooling and Heating

- Meter and record water use
- Check for and repair leaks

Cooling Systems and Towers

- Install a recirculating system
- Reuse blowdown for irrigation
- Reuse treated water for makeup water
- Use air cooling where possible
- Consider evaporative cooling
- Consider hybrid cooling towers
- Consider side-stream filtration or pulse power treatment

Boilers and Heaters

- Check and replace steam traps regularly
- Reuse condensate and blowdown

Pools and Spas

- Check for and repair leaks
- Cover pools when not in use
- Lower the temperature when not in use
- Keep filters clean to reduce backwash
- Adjust pool levels to minimize splash out
- Consider alternative water treatments

X-ray Processing/Labs

- Equip x-ray processors with shut-off valves
- Reduce the flow rate to the processors to a rate of 2 gallons per minute or less
- Eliminate continuous water streams for aspiration of liquids or other purposes
- Eliminate single-pass cooling of instrument analyzers
- Use sterilizers that re-circulate cooling water
- Install silver recovery systems
- Install flow restrictors on water-ring vacuum pumps or replace with oil-ring pumps

Landscape

- Check for and repair irrigation system leaks
- Use drought-tolerant native plants and turf
- Adjust sprinklers to irrigate landscape only
- Water deeply but infrequently
- Water during early morning or evening hours
- Install timers and moisture sensors
- Use drip irrigation
- Use fertilizer sparingly
- Install shut-off nozzles on hoses

