

B LUE GUIDE for WATER CONSERVATION



Reduce your water use at
home, work and play.



B BLUE GUIDE FOR WATER CONSERVATION

When water is cheap and reliable, it is easy to take it for granted. But what would it be like to have a limited quantity of water? How would it change the way we run our businesses and grow our food, and how would it impact our cost and quality of living? A lack of water is something most of us have never had to worry about. But changing weather patterns, increased demand, and stormwater management structures that send freshwater quickly downstream make water conservation vital to sustaining our quality of life.

The water from our taps comes from surface waters like rivers and reservoirs, or from underground pools called aquifers. The quality and quantity of the water they provide depends heavily on how we manage our daily life activities, and how we manage rainwater on the land. Everything we do on land has an impact on local waterways every time it rains. Small streams and wetlands are connected to the larger rivers and aquifers that supply our drinking water. In coastal areas, when too much water is drawn from an aquifer (or if not enough water is soaking into the natural system), salt water can "intrude" and make the water supply unusable for drinking and crop irrigation.

To maintain plentiful, healthy water for today and tomorrow, citizens from all community sectors must work together at home, at work, and even at play. Indoors, the goal is to reduce the amount of water that goes down the drain. Outside, we can reduce the amount of water that evaporates or runs off our properties. This Guide provides actions everyone can take to conserve and protect our precious freshwater resources.

con·ser·va·tion:
(noun)
The keeping or protecting of something from change, loss, or damage.



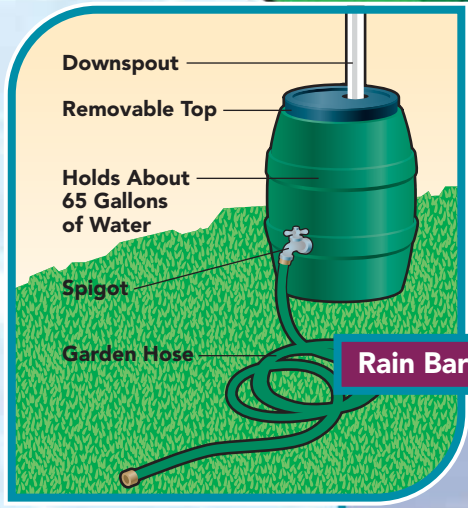
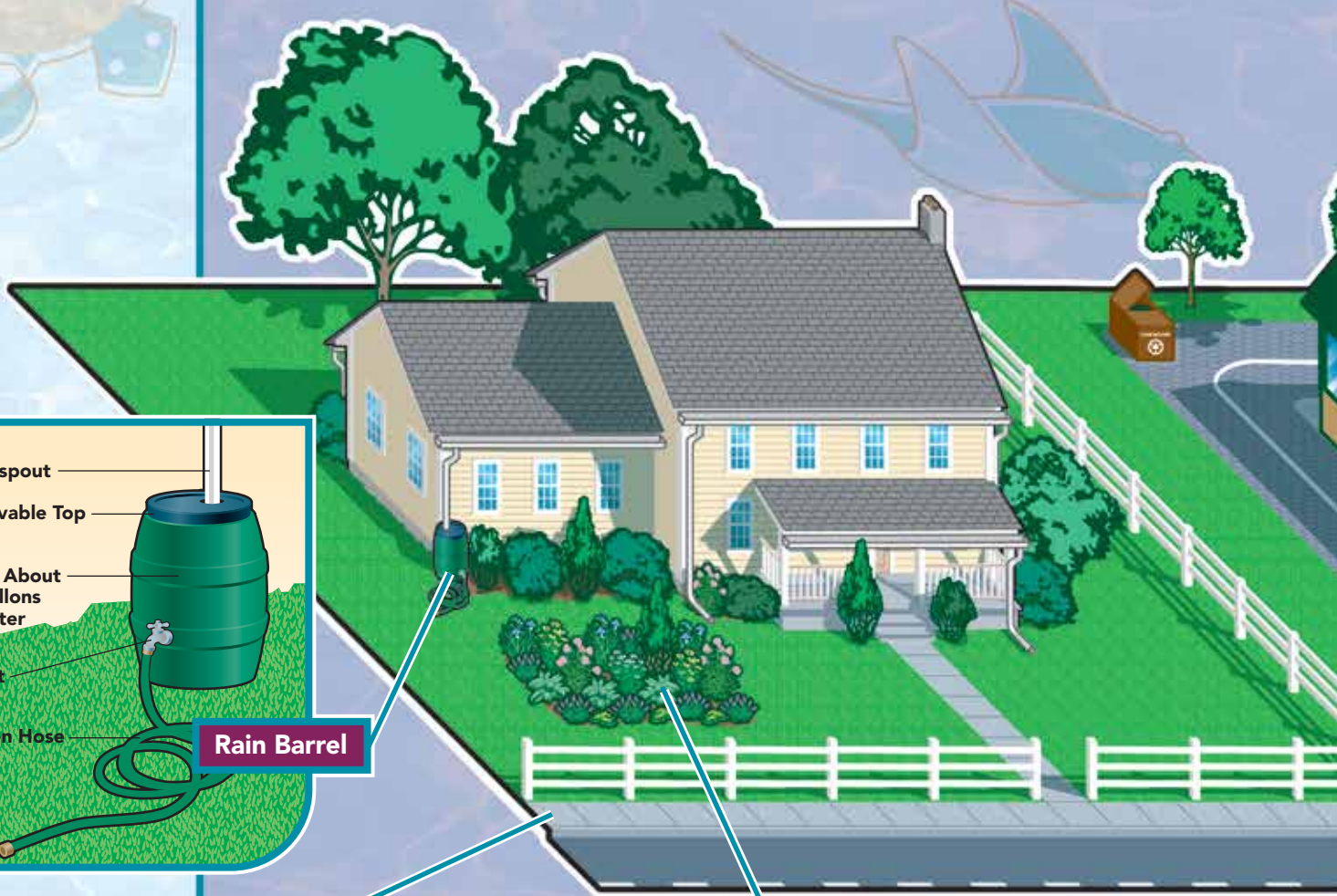
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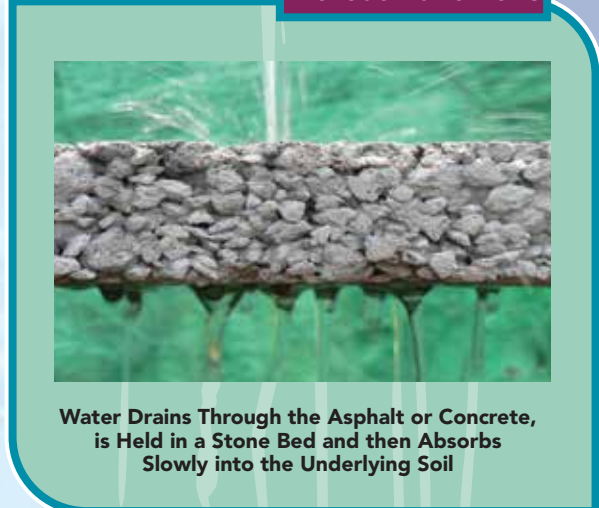
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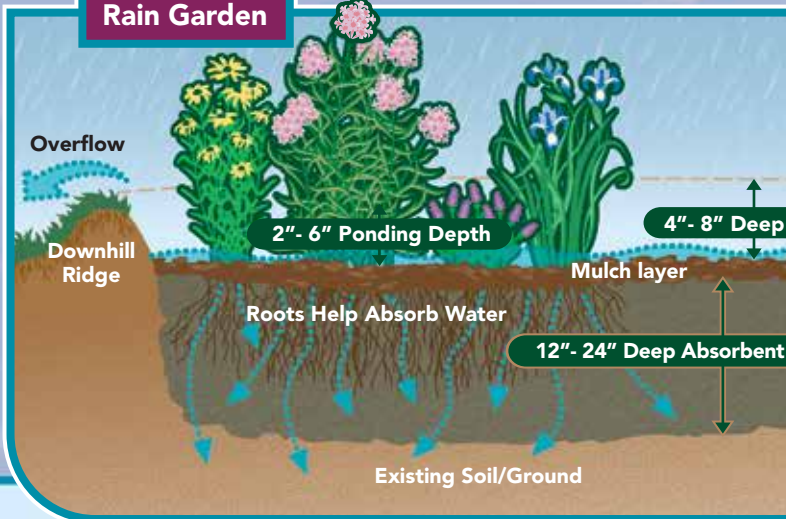
S OAK IT IN! Rain is natural, but stormwater is manmade. Unable to soak and filter into the ground, stormwater runs off of hard manmade surfaces like buildings and pavement. This runoff can cause flooding and carry pollutants to local waterways. Rain is fresh water — a valuable natural resource that is wasted when it becomes stormwater runoff. Here are some examples of green stormwater management that can replenish groundwater and reduce flooding.

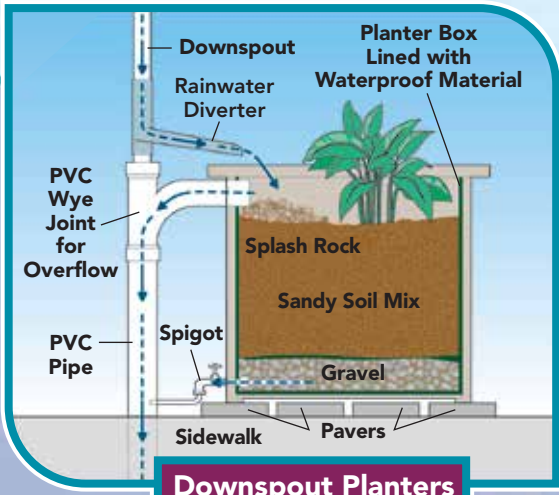


Porous Pavement

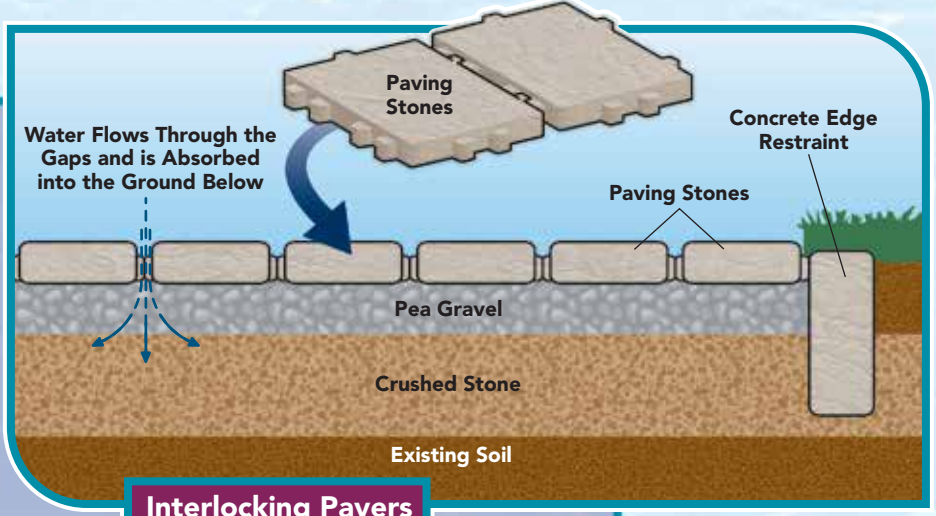


Rain Garden

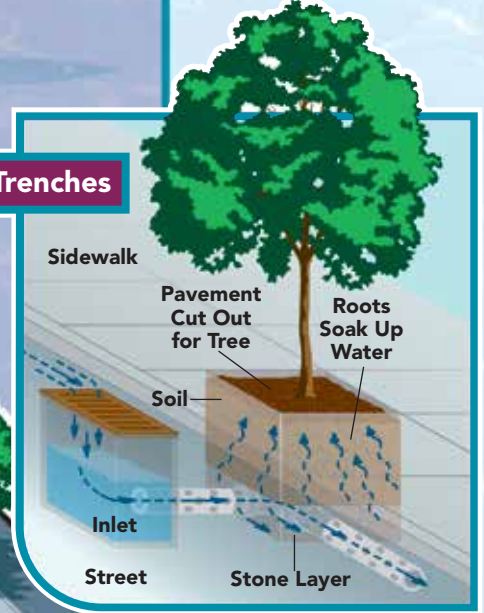




Downspout Planters

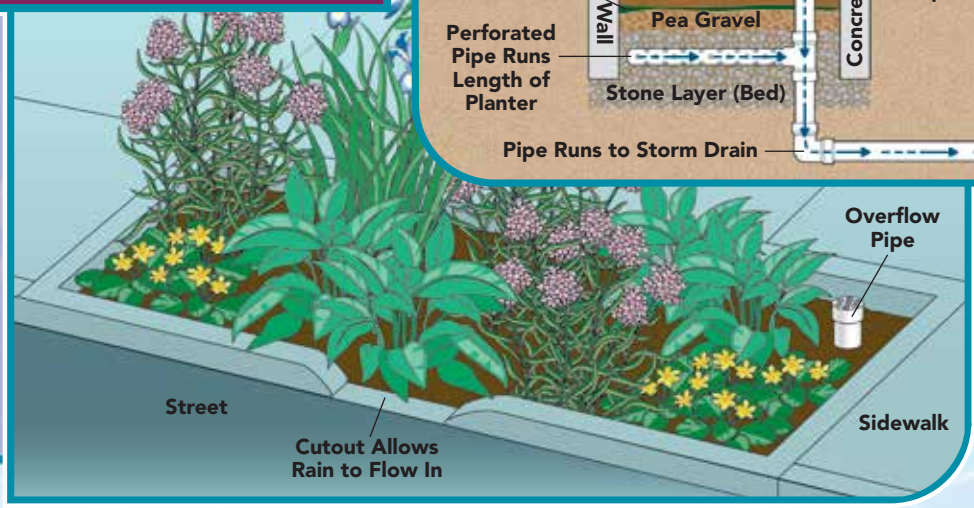
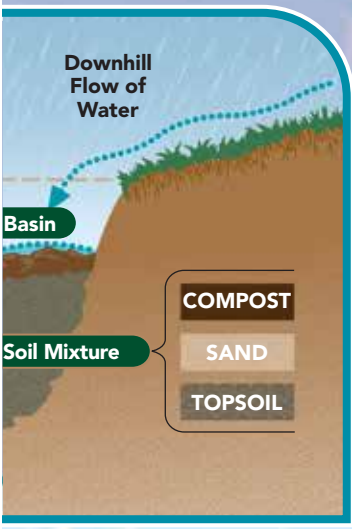
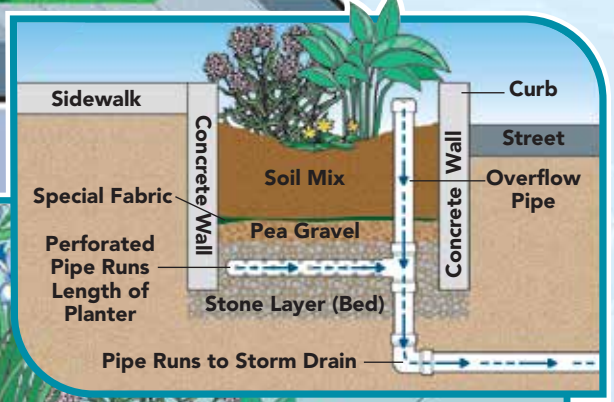


Interlocking Pavers



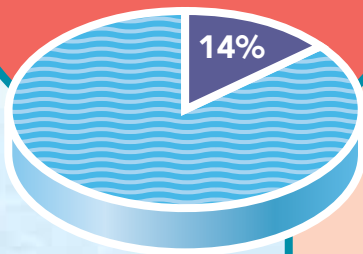
Tree Trenches

Sidewalk Stormwater Planters

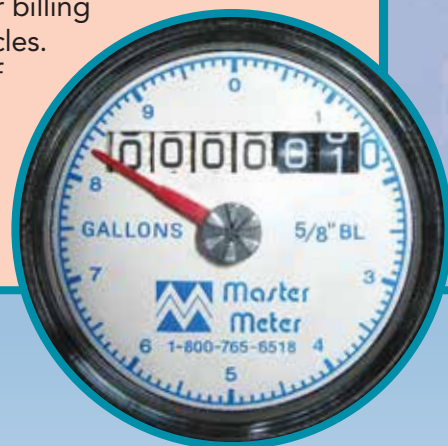


WATER CONSERVATION AT HOME

Domestic water use consumes an estimated 14% of all freshwater used in the U.S. (www.worldbank.org)

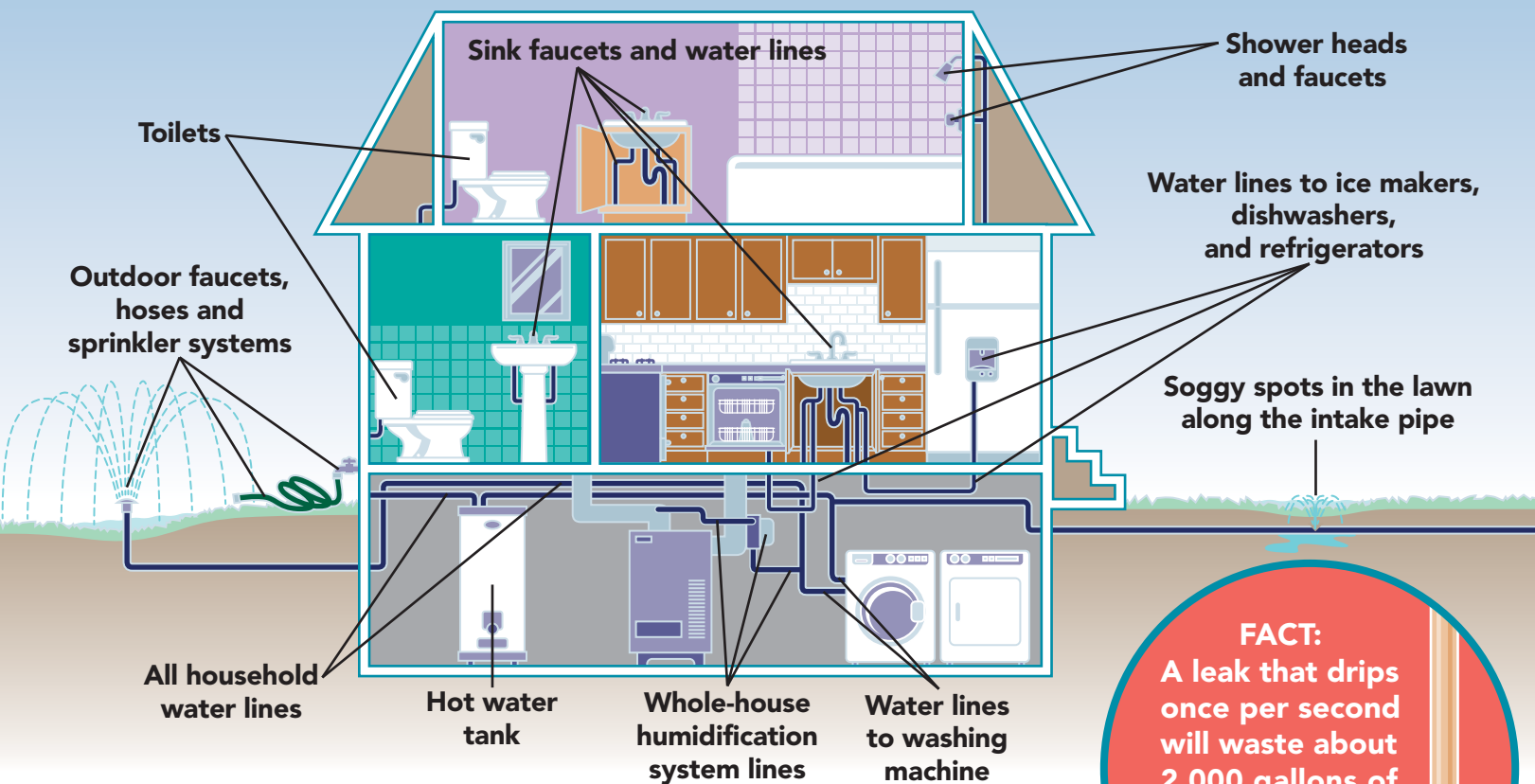


How much water are you really using? The average family of four uses approximately 400 gallons of water per day. The best way to start saving water is to understand how much you are using. If you are on a public water supply, many water providers conduct free home water audits or can provide you with kits to conduct your own. Your water bill will tell you how many gallons of water you use per billing cycle, and show comparisons to previous bill cycles. An increase can mean you have leaks in need of repair. Do you have your own well? Consider installing a flow meter to fully understand how much water you are using. **Now you are ready to start saving water!**



Look for those leaks and schedule needed repairs.

COMMON PROBLEM AREAS INSIDE AND OUT:

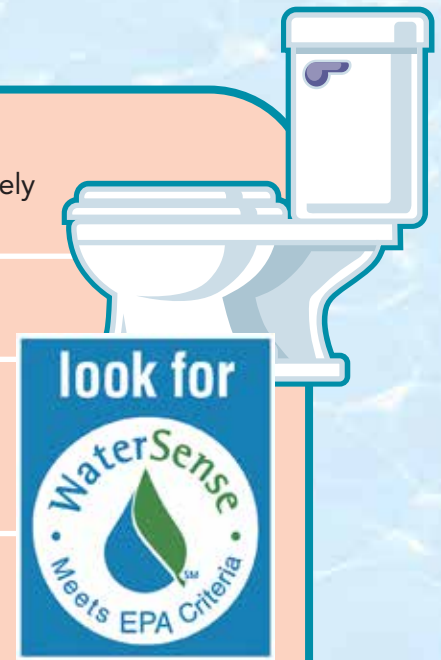


FACT:
A leak that drips once per second will waste about 2,000 gallons of water per year.

1

Inside the Home – Bathroom

- Use water-wise, low flow fixtures and showerheads and save approximately 7,600 (or more) gallons per year in an average household!
- Reduce shower time to 5 minutes and save 12,000 gallons of water per year !
- Consider a toilet upgrade – those installed prior to 1992 can use 3.5 or more gallons of water per flush. A **WaterSense** labeled toilet uses a maximum of only 1.3 gallons and saves nearly 11,000 gallons of water per year.
- Turn water off as you brush your teeth or shave, and your family will save over 11,000 gallons of water each year.



2

Inside the Home – Kitchen & Laundry


- Consider upgrading appliances that use water. **Energy Star** labeled dishwashers and washing machines can save a combined 30,000 gallons of water per year (as well as energy). Always run these appliances with full loads or at an appropriate load size setting.
- Don't let water run as you hand wash your dishes. Updated or aerated faucets can save over 15,000 gallons of water per year!
- Reuse water when you can. For example, you can use a tub of rinse water to water plants. Same goes for collected dehumidifier or air conditioning system condensation.
- Keep a pitcher of cold water in the fridge so you won't waste all those gallons at the faucet to get one cold glass of water.
- Compost vegetable waste instead of running the disposal in your sink.





3 Outside the Home

■ Avoid using sprinklers on windy days and during the hottest time of the day when evaporation will occur. NEVER allow sprinklers to run in the rain! A rain sensor will help to avoid this on automated sprinkler systems.




■ Only water as needed — lawns only need about 1 inch of water per week, and a heavy rainfall can sustain your yard up to 2 weeks. If you see puddles when the sprinkler is on, you are over-watering!

■ Raise your mower blade to at least 3 inches. Slightly longer grass creates shade for healthier root systems that soak up and retain more water.

■ Use drought and heat tolerant grass for your lawn, and convert some mown areas to more natural spaces with trees, tall grasses and native plants that will absorb more water and create less runoff.

■ Select native, drought tolerant plants for your landscaping and use mulch to retain moisture in the soil. Plants that are native to your climate require less water when established and are generally more tolerant of local pests and soil conditions.

■ Try soaker hoses and other drip methods instead of sprinklers to save 30-50% of landscape irrigation water use.



■ Retain the Rain — Using rain barrels or cisterns can provide you with free, fresh water to use on your lawn, in the garden, and even to wash your car and other outdoor items.

■ Speaking of car washing, commercial car washes recycle water. At home, use only a hose with a nozzle that shuts off while you scrub. Wash cars on the grass so some water can be absorbed back into the ground.

■ Use a floating pool cover and keep your pool and hot tub covered to reduce evaporation.

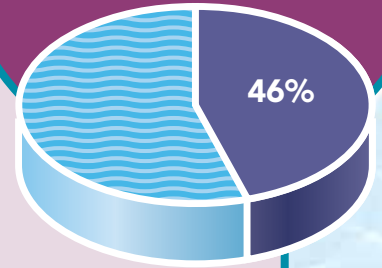
■ Use a broom to clean up walkways, steps and driveways instead of the hose.

■ Shovel snow and ice as a first response to slippery conditions and consider using only salt-free de-icing alternatives when necessary.



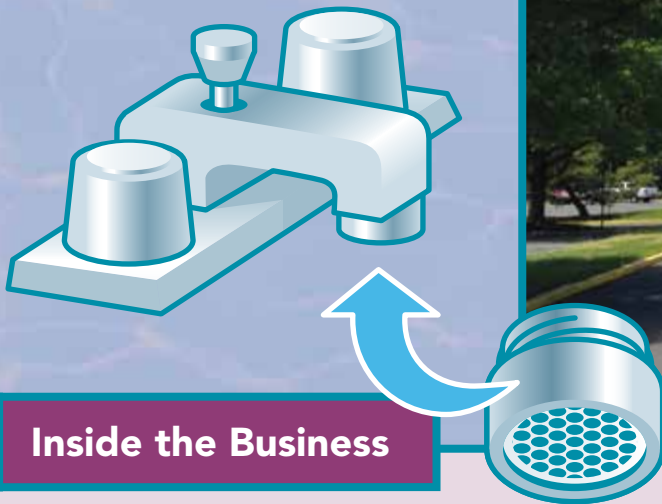
WATER CONSERVATION IN BUSINESS AND INDUSTRY

Industry and institutions account for an estimated 46% of all freshwater used in the U.S. (www.worldbank.org)



Where would our economy be without plentiful, clean water supplies? While most machinery may run on electric and fossil fuels, clean water supports all functions of a healthy economy and our quality of life.

Water demands on the job vary by products involved. But all businesses can take a look at common water usages and make easy changes to save water and reduce utility costs.

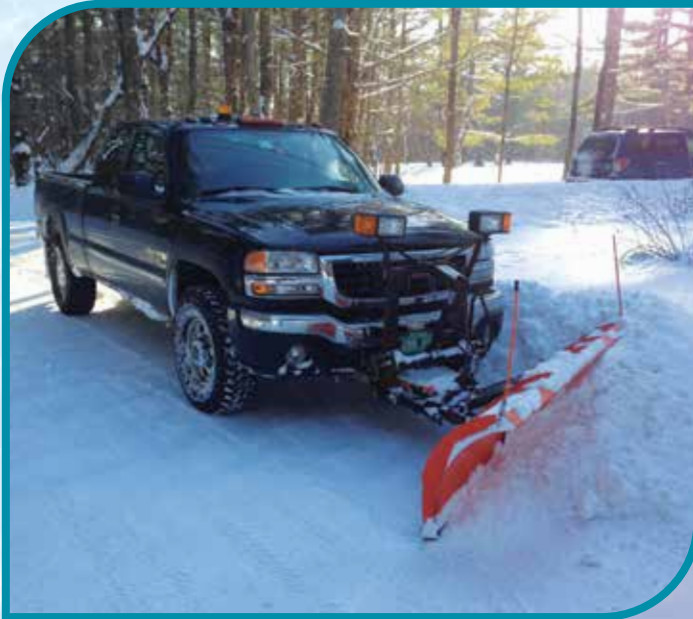


1 Inside the Business

- Install aerators and low flow or motion sensing faucets in bathroom and kitchen areas as well as **WaterSense** labeled toilets and urinals.
- Conduct a company water use audit to fully understand where water demand can be reduced.
- When possible, consider using reclaimed wastewater or captured rainwater for industrial processes.
- Designate a contact person or department for employees to report plumbing leaks and make it a maintenance priority to repair them.
- Wash company vehicles at a carwash that recycles water only when they need it — not on a routine schedule.
- Update and maintain cooling and heating systems to save energy and minimize water needs.

2 Outside the Business – Grounds and Landscaping

- Replace expensive, high maintenance turf grass with absorbent meadows, native plant gardens, trees, and rain gardens. Save money on mowing and improve employee morale with inviting and relaxing outdoor spaces.
- Make sure sprinkler systems do not water paved areas.
- Only water as needed and use moisture-sensing irrigation controllers. Avoid watering on windy or very hot days to reduce water lost to evaporation. Never allow sprinklers to run during rain.
- Use brooms to sweep outdoor walkways instead of hosing them down.
- Retain the Rain - Using rain barrels or cisterns can provide you with water to use on lawns, in landscaped areas, and even to wash vehicles and outdoor equipment. Collected water can also be used for "gray water" purposes like flushing toilets in specialized systems.

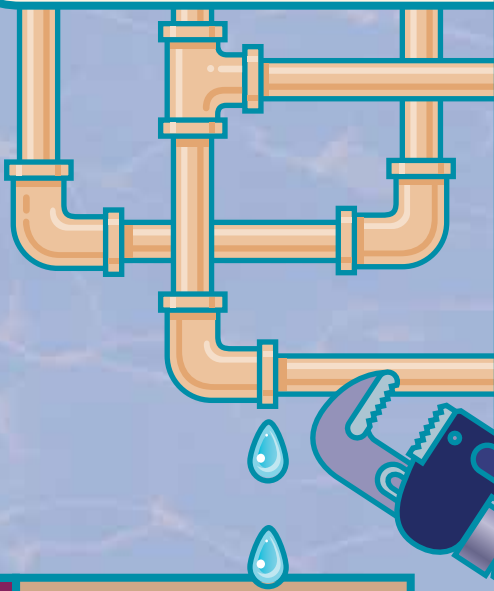


- Keep snow piles at least 100' away from streams and floodplains.
- Dump snow in areas that will allow melting snow to soak into the ground.
- Store de-icing material on pads and under cover away from stormwater flow paths and storm drains.
- Schedule street sweeping to remove residual salts from parking areas each spring.



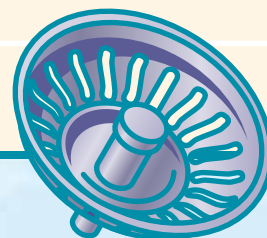
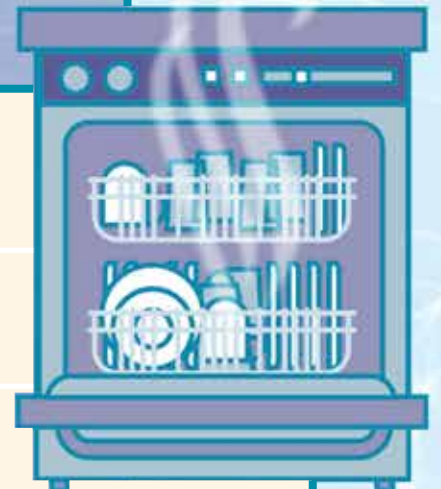
WATER CONSERVATION AT SCHOOL

You may not think of schools as large water consumers. However, water is used in heating and cooling systems, in fire prevention systems, for janitorial and maintenance needs, and in the cafeteria for food prep and clean up. There are also showers in the gyms, drinking fountains, bathroom facilities, swimming pools, and classroom sinks. Outside, there are massive sports fields, mown lawn areas, and landscaping. All of these areas offer opportunities to conserve water.



1 Inside the School

- Make leaks in pipes, sinks and toilets a priority on maintenance repair to-do lists.
- Install aerators and low flow or motion sensing faucets in bathroom and kitchen areas as well as **WaterSense** labeled toilets and urinals. Install water-saving toilet dams in older toilets.
- When updating older facility systems and kitchen equipment, choose water efficient and energy saving models as well as ice making and cooking appliances that reuse captured steam or melted ice.
- Train staff on water-saving techniques, i.e. never leave taps running and only run full loads of dishware in washers.
- Use strainers instead of garbage disposals in kitchen sinks.



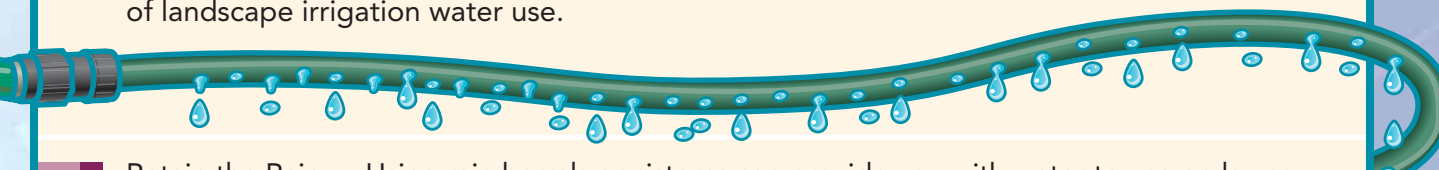


2

Outside the School – Ball Fields, Grounds, and Landscaping

- Use drought tolerant grasses in ball fields.
- Water only as needed — Lawns and ball fields only need about 1 inch of water per week, and a heavy rainfall can sustain them up to 2 weeks. If you see puddles when the sprinkler system is on, you are over-watering!
- Where possible, convert turf grass to natural meadows or forest to increase water absorption. Save money on reduced mowing costs and create outdoor classrooms for nature studies.
- Select native, drought tolerant plants for landscaped areas and use mulch to retain moisture in the soil. Native plants require less water when established and are generally tolerant of local pests and soil conditions.
- Make sure sprinkler systems do not water paved areas.
- Use moisture-sensing irrigation controllers so your sprinklers never run in the rain. Avoid watering on windy or very hot days to reduce water lost to evaporation.
- Raise mower blades to at least 3 inches. Slightly longer grass creates shade for healthier root systems that soak up and retain more water.
- Try soaker hoses and other drip methods as an alternative to sprinklers to save 30-50% of landscape irrigation water use.



- 
- Retain the Rain — Using rain barrels or cisterns can provide you with water to use on lawns, in landscaped areas, and even to wash vehicles and outdoor equipment. Collected water can also be used for “gray water” purposes like flushing toilets in specialized systems.
 - Use brooms to sweep outdoor walkways instead of hosing them down.
 - When treating icy parking lots and walkways, consider using salt-free de-icers and keep snow piles at least 100’ away from streams, floodplains, and storm drains.
 - Dump snow in areas that will allow melting snow to soak into the ground.

WATER CONSERVATION AT HOTELS

Hotel water usage can account for a substantial percentage of water used in commercial and institutional facilities. It's no wonder when you consider all those bathrooms, laundry demands, restaurants, pools, and landscaping needs.



1 Inside the Hotel

- Educate your guests on your water conservation efforts and encourage them to reuse towels and bed linens instead of having them washed every day.
- Train cleaning staff to take only guest-designated towels and linens for cleaning.
- Upgrade Laundry facilities with water efficient equipment.
- Run only full loads of laundry.
- Replace inefficient fixtures with **WaterSense** labeled faucets, showerheads, toilets, and urinals.
- Install aerators and low flow or motion sensing faucets in public bathrooms.
- Make leaks in pipes, sinks and toilets a priority on maintenance repair to-do lists.
- Use water efficient dishwashers as well as ice making and cooking appliances that reuse captured steam or melted ice.
- Train kitchen staff on water-saving techniques, i.e. never leave taps running and only run full loads of dishware in washers.
- Use strainers instead of garbage disposals in kitchen sinks.



2

Outside the Hotel – Grounds and Landscaping

- Use native, drought tolerant plants in landscaped areas and use mulch to retain moisture in the soil. Plants that are native to your climate require less water when established and are generally tolerant of local pests and soil conditions.
- Only water as needed and use moisture-sensing irrigation controllers. Avoid watering on windy or very hot days to reduce water lost to evaporation. Never allow sprinklers to run during rain.
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- Dump snow in areas that will allow melting snow to soak into the ground.
- Schedule street sweeping to remove residual salts from parking areas each spring.





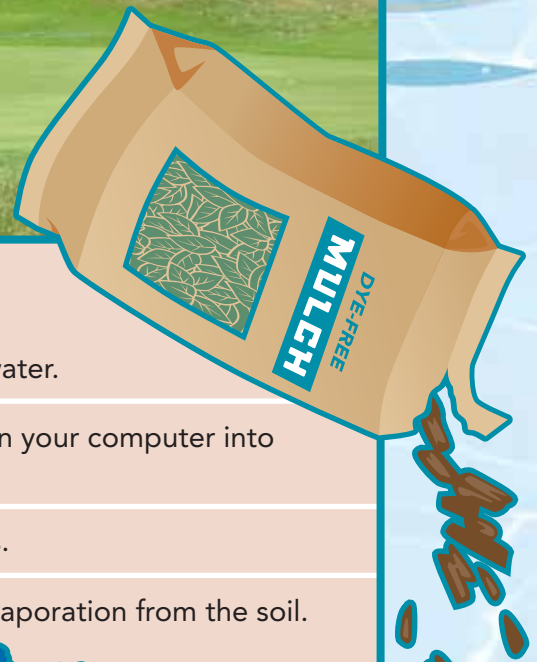
WATER CONSERVATION AT GOLF COURSES & OTHER LARGE RECREATIONAL LAND AREAS

We love lush and green outdoor spaces. But what is the true cost of all that man-made greenery? Water conservation depends upon water-wise land management, and using nature to soak water back into the ground. We can have our fun, and conserve water too!



1 Water-wise Irrigation

- Consider upgrading to state-of-the-art irrigation systems that will out-perform aging equipment and save thousands of gallons of water.
- Use weather related software and ground moisture sensors to turn your computer into an efficient irrigation management station.
- Never allow sprinklers to operate in the rain or water paved areas.
- Use mulch in flower beds and landscaped areas to avoid water evaporation from the soil.



2

Grounds Management

Define vehicle, cart, and pedestrian traffic to specific pathways to avoid overall compaction of soil. Hardened ground cannot absorb water and increases soil erosion and stormwater runoff.

Where turf grass is needed, use cultivated grasses that are drought and pest resistant.

Employ aeration and other soil cultivation techniques to improve water infiltration and reduce runoff.

Consider use of treated municipal wastewater for irrigation purposes.

Create onsite water storage ponds in low lying areas for irrigation use in dry weather.

Where turf grass is not needed, allow growth of longer rooted grasses, shrubs and trees to create naturalized meadow areas that soak up water and reduce wasteful runoff.

Where grass is needed, set mower blades high to allow longer grass to shade its own roots and prevent moisture evaporation from the soil.

Adopt policies to minimize water usage and train your staff to conserve water.

When treating icy parking lots and walkways, keep use of salt to a minimum and consider using salt-free de-icers.

Keep snow piles at least 100' away from streams and floodplains.

Store de-icing material on pads and under cover away from stormwater flow paths and storm drains.

Dump snow in areas that will allow melting snow to soak into the ground.

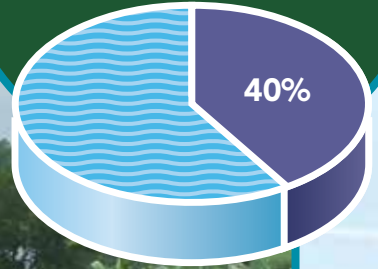
Schedule street sweeping to remove residual salts from parking areas each spring.



WATER CONSERVATION ON THE FARM

Successful farming depends on the availability of fresh, clean water. Perhaps no other industry has more at stake than the farms that provide us with healthy and abundant food. Because of agriculture's huge water demand, there are many opportunities to conserve and protect water resources on the farm.

Agriculture utilizes approximately 40% of all freshwater used in the United States. (www.worldbank.org)



1 Water-wise Irrigation

- Install water flow meters to understand and monitor your water usage.
- Consider using low-spray (close to the ground) or drip irrigation systems that can substantially reduce water lost to evaporation and runoff.
- On pivot irrigation systems, use hose drops that keep spray close to the ground instead of shooting it high into the air. Use holding ponds as water supply for this purpose.
- Use local weather data and computer software programs/apps to determine effective irrigation times. Soil sensors can report moisture data directly to your computer.
- Level and contour-plow fields where possible to reduce runoff of irrigation and rain water.
- Capture water that runs off your fields (tailwater) for reuse.
- Consider creating berms between rows to reduce runoff.



2 Grounds Management

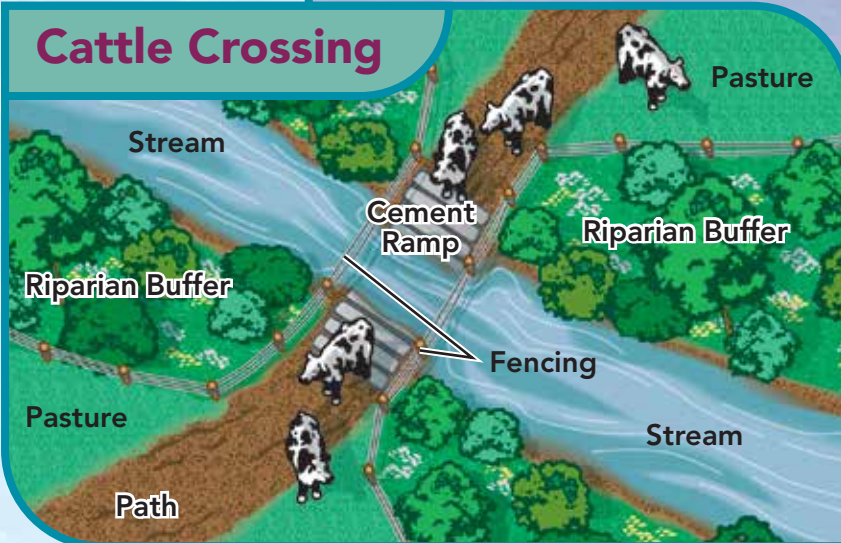
- Where appropriate for the crop, use black plastic film or reusable landscape cloth to prevent moisture evaporation and reduce watering needs.
- Use cover crops to reduce water evaporation from the soil.
- Avoid compacting soil with heavy machinery and manage/improve soils to maximize water infiltration and retention.
- Plant trees to provide windbreaks to reduce water evaporation on the fields.

3 Building and Systems Maintenance

- Install gutters to capture the rain that runs off buildings, barns, and even hoop houses in barrels and cisterns to use for irrigation and cleanup.
- Be on the lookout for leaks and make repairs as quickly as possible.



Cattle Crossing



4 Livestock Management




- Install livestock fencing and cattle crossings to keep livestock waste out of creeks and groundwater spring areas.
- Graze livestock rotationally to avoid overgrazing and loss of groundcover.
- Divert rainwater runoff away from heavy livestock traffic and manure areas.
- Manage manure and runoff from livestock areas in both wet and dry storage facilities with 6 months of storage capability to time with field spreading. Securely tarp uncovered manure piles. Manure storage should be kept at least 100' from streams and floodplains.

D ELAWARE RIVER BASIN

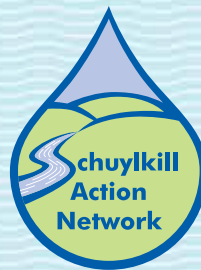
The rivers and streams of the Delaware River Basin provide drinking water to over **15,000,000** people in New Jersey, Pennsylvania, Delaware, and New York. The aquifers that lie under the ground provide drinking water to millions more. These surface and underground water resources also fuel agriculture and industry in our region. **Thank you** for taking action to sustain them for current and future generations.



KEY

-  State Borders
-  Delaware River Basin Borders
-  Delaware Estuary Borders

SUPPORT PROVIDED BY:



Funding for this guide was provided by the US Environmental Protection Agency in support of the National Estuary Program.



The **Partnership for the Delaware Estuary**, a National Estuary Program, leads science-based and collaborative efforts to improve the tidal Delaware River and Bay, which spans Delaware, New Jersey, and Pennsylvania.

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