



Are You Helping to Protect Your Watershed?

When it comes to pollution, what comes around goes around (and around and around) the watershed. Your actions can leave footprints... footprints that can affect others downstream.

Learn to say "No" to common practices that contribute to pollution in the Plum Creek Watershed of the Guadalupe River Basin -- together, we can preserve it as one of the most unique in Texas.



GUADALUPE-BLANCO RIVER AUTHORITY

933 East Court Street - Seguin, Texas 78155
 (830) 379-5822 or (800) 413-5822
www.gbra.org



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Watershed Awareness: *Just the Facts!*

Exercise your rights and your responsibility to be *In the Know* about watersheds.

First of all, what is a 'Watershed'?

A watershed is the area of land that drains into a specific water body. You live in the Plum Creek Watershed, one of ten mini-watersheds that make up the Guadalupe River Basin – possibly the most beautiful river basin in the state of Texas.

What do you REALLY need to know about watersheds?

You need to know that your actions can have an impact on the water quality (how clean the water is) in your watershed. Whether you know it or not, you can leave 'footprints' that can have a detrimental effect on the water quality in our creeks and rivers.... And this is water that is used by thousands of folks for drinking water. It is also used for agriculture, industry and recreation.



Federal Agencies

Environmental Protection Agency (EPA) Region 6

www.epa.gov 1-800-887-6063

The EPA is the guiding policy and enforcement source behind TCEQ's programs. EPA's website has an abundance of information on how to protect our precious water sources.

County Resources

Texas AgriLife Extension

Hays County

www.hays-tx.tamu.edu

512-393-2120

Caldwell County

www.caldwell-tx.tamu.edu

512-398-3122

Plum Creek Conservation District

www.pccd.org

512-398-2383

Conservation Resources

Native Texas Plants -- Visit your local nursery or plant retailers to find out what plants are native to your region of Texas. You can also visit <http://yardwise.org> or the **Native Plant Society of Texas**

<http://www.npsot.org/>

830-997-9272

Composting and the Use of Organic Products -- local nurseries and plant retailers have organic fertilizers and pesticides.

<http://yardwise.org>

<http://vegweb.com/composting/>

<http://www.texasstar.org/index.php?pg=composting>

<http://aggie-horticulture.tamu.edu/extension/>

Alternatives for Household Cleaners

http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/gi/gi-328_4233910.pdf

<http://www.ecocycle.org/hazwaste/recipes.cfm>

Health Care Industry Disposals

<http://www.noharm.org/us>

Volunteer Opportunities

Texas Stream Team – www.txstreamteam.rivers.tx.state.edu

Master Naturalists -- <http://masternaturalist.tamu.edu>

Master Gardeners -- <http://aggie-horticulture.tamu.edu/mastergd/gd.html>

Texas Nature Trackers -- www.tpwd.state.tx.us/learning/texas_nature_trackers

Keep Texas Beautiful -- www.ktb.org/programs/index.html

Step Back to the Facts:

Improper use and disposal of hazardous household and landscape products can lead to the contamination of groundwater and surface water. The average American household generates 15 pounds of household hazardous waste each year. At any given time, our homes contain an average of three to eight gallons of hazardous waste in kitchens, bathrooms, garages, and basements. Don't be a part of the problem...be a part of the solution! Eliminate your footprints.

Who's In The Know in the Plum Creek Watershed

Who to Contact for More Information

This is just a sampler of the many places you can contact for more information about how to protect our water quality. There is a ton of information out there about water quality, about who is doing what to protect it and who to call if you have a local concern. Thanks to the Internet, most of this information is only a click away. Dig in to investigate the water quality concerns that are in the Plum Creek and Guadalupe watersheds, and explore what you can do to make a difference.

Regional Resources

The Plum Creek Partnership Project

www.pcwp.tamu.edu

The Plum Creek Watershed Partnership was formed by Texas State Soil and Water Conservation Board and Texas AgriLife Extension Service to develop and implement a plan that protects water resources in the Plum Creek Watershed now, and into the future. A steering committee made up of local stakeholders guides the watershed planning and implementation process for the project.

Guadalupe-Blanco River Authority

www.gbra.org

830-379-5822 or 800-413-5822

Find out more about efforts to preserve, protect and conserve the Guadalupe River Basin.

Clean Rivers Program (Guadalupe River Basin)

www.gbra.org/?datapage=crp.asp

www.tceq.state.tx.us/compliance/monitoring/crp/

The Clean Rivers Program is administered by the TCEQ. The Guadalupe River Basin Highlights Report, routine water quality monitoring data and special studies are available on GBRA's website.

State Agencies

Texas Commission on Environmental Quality

www.tceq.state.tx.us or 512-239-1000

TCEQ, the state environmental regulatory agency, sets policy for management of our air, water and waste. The TCEQ website has links to thousands of publications about water quality, watershed management and stewardship. The local field offices can be contacted if there are concerns specific to your area. **Region 11 Austin Field Office 512-339-2929**

Texas State Soil and Water Conservation Board

www.tsswcb.state.tx.us or 800-792-3485

Administers Texas soil and water conservation law and coordinates conservation and pollution abatement programs.

TCEQ's Household Hazardous Waste (HHW)

www.tceq.state.tx.us/assistance/hhw/hhw.html

Management Program helps citizens and municipalities with educational and regulatory information on HHW programs, technical assistance setting up a HHW collection program, and general information on HHW issues.

Local Environmental Recycling Information

www.1800Cleanup.org or www.earth911.com

(by ZIP code) on recycling HHW, automotive used oil, pesticides, batteries, electronics, and other items.

Texas Illegal Dumping Resource Center

www.tidrc.org or 903/891-3632

Enforcement education for Texas cities and counties.

TCEQ's Agriculture Waste & Pesticide Collection

www.tceq.state.tx.us/assistance/Agwaste/agwaste.html

Helps rural and agricultural communities with recycling and safe disposal of unused pesticides and other unwanted products.

Texas Emergency Spill Reporting

800-832-8224

www.tpwd.state.tx.us/landwater/water/environconcerns/kills_and_spills/

Hays or Caldwell Counties

512-353-3474 or 512-389-4848 (24 hour line)

Call if you are a witness to or are concerned about a possible hazardous waste spill.

EPA Pharmaceutical & Personal Care Product Disposal

www.epa.gov/ppcp/

Information why these products are environmental concerns and Federal guidelines for the proper disposal of prescription drugs.

Now that we know about these 'footprints'.....

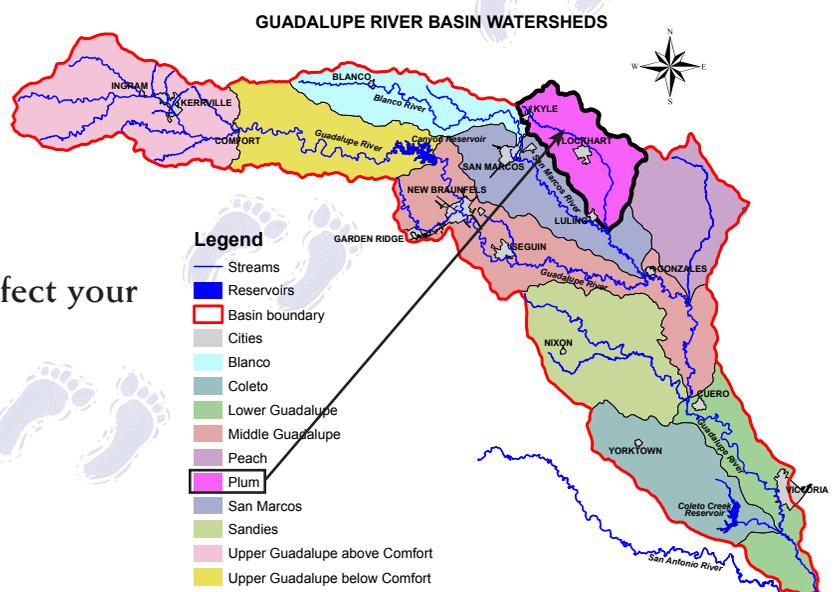
What can you do to help preserve and protect your watershed?

Get to know your watershed --

- Are there any creeks or streams nearby?
- Where is the headwaters, or source of the stream?
- Where does the water travel from there?
- How is the water used downstream?

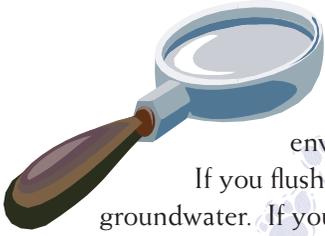
Understand how your footprints can affect your watershed's water quality --

- What kind of pollutants are leaving your property in runoff?
- What activities do you conduct on your property that could produce these pollutants?
- Is there a drinking water treatment facility downstream?



Watershed Awareness

Dos and Don'ts: Inside the House



How Do Your Actions *Indoors* Affect Water Quality *Outdoors*?

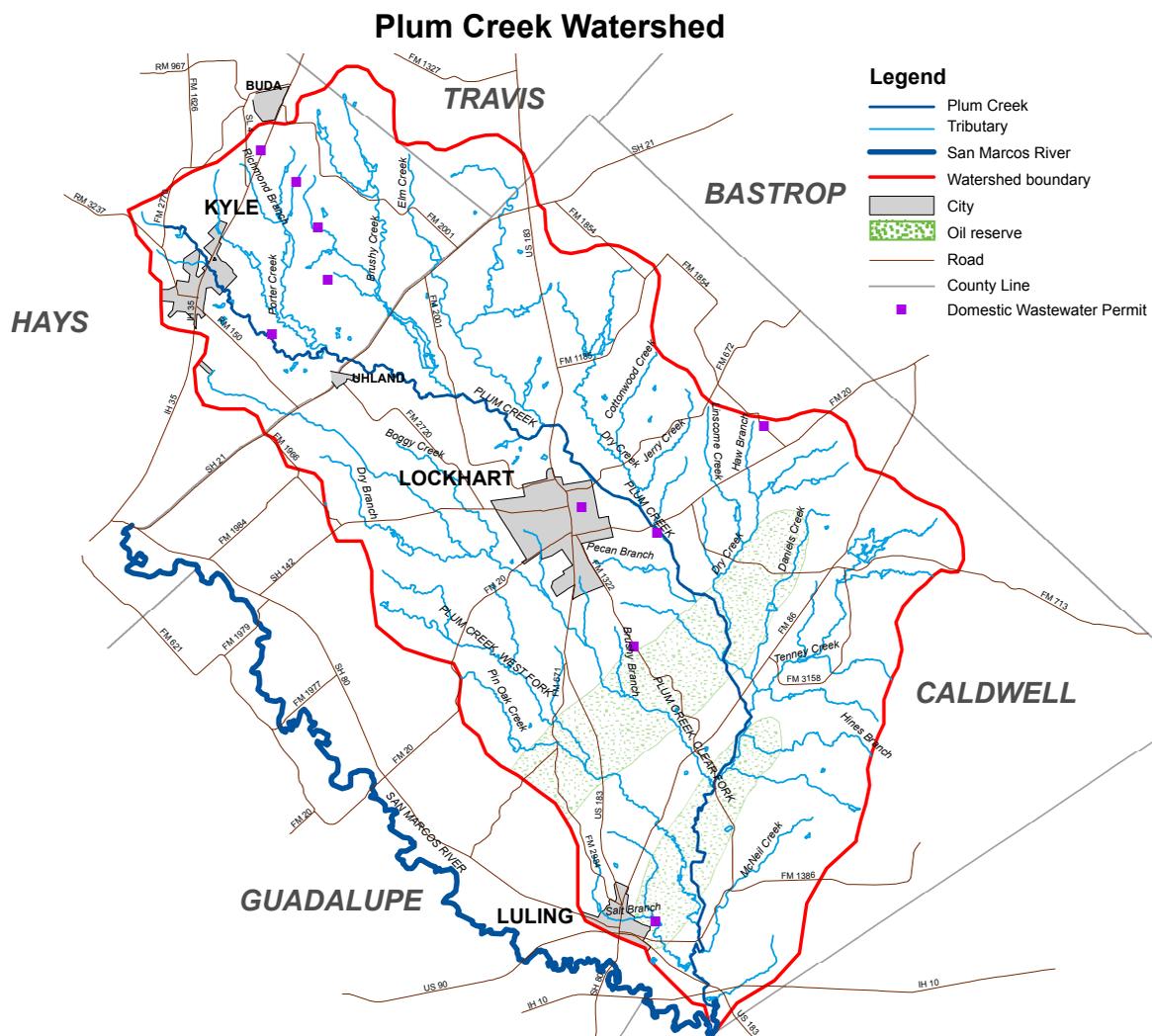
Every household creates Household Hazardous Waste (HHW), which is one of the environmental concerns we face. HHW leaves behind some pretty significant footprints.

If you flush HHW down the toilet or sink, it can create problems underground and possibly get into the groundwater. If you toss those wastes outdoors, HHW can get caught up in the runoff during a rain. That runoff will end up in our creeks, streams, and eventually the rivers in our basin. In addition, medicines and many personal care products should not be flushed or poured down the toilet or sink. Instead, they should be thrown away in the trash.

What in the World is Household Hazardous Waste?

Get one thing perfectly clear: We are not talking about drums of nuclear waste. We are talking about things that are often left lying around --under our bathroom or kitchen sinks, maybe in our garages. Things like batteries, household cleansers, solvents, polishes, pesticides and cans of oil-based paint are considered to be hazardous. The federal and state government encourages recycling these items.

To make the situation even more challenging, many of our electronic gadgets and tools can add to the hazardous waste stream. For example, computer monitors, hard drives, televisions and cell phones need to be handled properly.



Top Ten Things You Can Do To Protect The Plum Creek Watershed

1. Water only when and where it is really needed.
2. Limit the use of pesticides and fertilizers.
3. Plant native vegetation.
4. Redirect rooftop runoff.
5. Dispose of pet waste properly.
6. Carefully choose where you wash your car.
7. Properly maintain vehicles.
8. Recycle and dispose of household chemicals properly.
9. Properly maintain septic systems.
10. Properly dispose of all wastes - no illegal dumping.

Keep in Mind - The choices that you and your household make influence what happens in your watershed. Remember that your watershed, no matter how small, affects other watersheds downstream. We all live 'downstream'.

Stewardship: Top Ten Things You Can Do to Show You Care

Stewardship:

Clues on How To Be a Plum Creek Steward

Let's go back to the beginning. People, animals, birds, fish and plants all live in a watershed and all need clean water to survive. Not all watersheds are the same – they come in many shapes and sizes, and have different natural and man-made features. Watersheds in the Guadalupe River Basin can have rocky hills or be on flat prairies. They can be made up of farmland, ranchlands, small communities and big cities. Big or small, urban, suburban or rural, we should all understand our connection to watersheds and want them to be healthy.

Understanding this is one thing. Showing that you understand through your everyday choices and decisions makes you a Watershed Steward. A steward is one who strives to increase public awareness about watersheds and follows through with good pollution prevention practices.

By now you understand that everyday activities taking place in the Plum Creek Watershed, including what you do in and around the house, have a direct impact on the quality of water. Government regulations seek to preserve and protect our water for its users. However, regulation alone is not enough. According to the Environmental Protection Agency (EPA), about 80% of our water pollution comes from non-point source pollutants, which is difficult to regulate. By learning how our activities affect water and how we can change our habits to protect it, each of us can make an important contribution to protecting this valuable resource.

Knowing how your activities affect the watershed, and making conscience choices are indicators that you are well on your way to becoming a good steward of the river basin.

The Plum Creek Watershed is 397 square miles and the creek is 52 miles long. The watershed includes portions of the city of Buda, as well as the cities of Kyle, Lockhart, and Luling. It includes all of the land that drains into Plum Creek as the creek makes its way to the San Marcos River at Luling. Land uses in the Plum Creek Watershed vary widely. Rapid urban growth

in the northern region can contribute to non-point source pollution. In addition, there are a number of wastewater treatment plants that use Plum Creek and its tributaries as their discharge point. In the middle to southern regions, agriculture activities, along with petroleum and gas production activities, may also be causes of non-point source pollution. In the southern point of the watershed, Plum Creek merges into the San Marcos River. The San Marcos River then flows into the Guadalupe River at Gonzales. The Guadalupe River then flows into San Antonio Bay at the Gulf of Mexico.

Remember, everybody lives "downstream". Many of the communities downstream of Plum Creek use this same water for their drinking water, recreation and industry.



The improper disposal of HHW can cause problems for the entire community. Wastes can be explosive or highly flammable. Sewers have exploded and garbage trucks have burned because people have carelessly discarded flammable or reactive waste. Hazardous wastes can also be corrosive. The acids from discarded auto batteries can eat away at many substances. Some wastes are poisonous to humans or wildlife, while others can cause cancer, birth defects or other serious medical problems. You should also know that using the garbage grinder in the kitchen sink or pouring cooking grease down the drain can cause sewer back ups into your home. These wastes can also plug sewer pipes in the city or on your septic system.

What To Do With These Wastes -- So That You Don't Leave Footprints

One thing is for sure... dumping HHW down the drain is not a good idea. Septic tanks and municipal wastewater systems are not designed to handle such harsh wastes. Disposing of these wastes in a landfill (by throwing them in the garbage) is not a good idea either. Not all landfills are designed for HHW, which can leach into the groundwater over time.

There are some preventive measures you can take in your home to reduce the amount of household waste you generate. One of the easiest things you can do is to find alternatives for some of the products you use. If you do happen to generate HHW, check the WHO'S IN THE KNOW section for disposal sites. You could also try following the "3 Environmental R's" -- Reduce, Reuse and Recycle.

Reduce -- Buy only the amount you need for a job, that way you won't have to dispose of any excess. Also, only use the amount indicated on the label.

Reuse -- If you have a product that is usable, but you don't need or want it, give it to someone who will use it.

Recycle -- Take your batteries to a drop off center and return lead-acid batteries to the place of purchase.

Check out CLUES UNDERGROUND and CLUES ABOVE THE GROUND to help you learn more about what to do with these types of wastes.

Footprints Inside the House

Dos and Don'ts: *Outside the House*

How Do Your Actions *Outdoors* Affect Water Quality?

Your impact on water quality through your activities outdoors can be easily measured through the approach you take to landscaping. Both **WHAT** you **PUT** on your yard and **HOW** you **TREAT** your yard are a good reflection of your understanding of the footprints you leave behind. If you improperly use, store or dispose of Household Hazardous Wastes outdoors, its residues can be caught up in the runoff during a rain event, and become a part of the stream and river. This creates challenges for water users downstream such as drinking water treatment facilities and aquatic life that live in the water.

Household Hazardous Waste -- It is Not Only Found Indoors!

Yes, its true – HHW can be found both **INSIDE** and **OUTSIDE** the house. A large percentage is either stored outside or improperly applied to the ground. The average household contains between three and eight gallons of materials that could be hazardous to human health or to the natural environment. If improperly stored or disposed of these materials can poison our water (both groundwater and surface water) if not used properly, stored carefully and disposed of correctly.

Learn to Love Your Lawn - *Naturally*

Many homeowners take great pride in the development and maintenance of a visually appealing lawn and its associated landscaping. One of the biggest culprits is the grass – although it looks nice, some grasses (like St. Augustine) can be very needy – the use of chemical fertilizers and pesticides is quite common. Unfortunately, many homeowners operate under the “more is better” practice, using on average eight times more chemicals than needed.

What Types of Pollutants Can Be Caught Up in Non-Point Source Pollution?

- Excess fertilizers, herbicides, and insecticides from residential areas
- Oil, grease, and toxic chemicals from runoff
- Sediment from improperly managed constructions sites and eroding stream banks
- Improper disposal of motor oil, car batteries, and home chemical containers
- Bacteria and nutrients from livestock, pet wastes, sewer system overflows, and faulty septic systems

What Can You Do To Help Minimize Non-Point Source Pollution?

First, take a look at your own backyard. You can help to control soil erosion by planting ground cover or stabilizing erosion-prone areas. Clean up after your pets – pick up their waste and throw it away. Consider making a commitment to using native plants, including turf grass. Native plants need less water and require less attention in the way of fertilizers and pesticides. Also consider using organic products on your lawn and in your garden, including fertilizers and pesticides. When improperly used, chemical lawn and garden fertilizers can enter the runoff and cause an increase in nutrient levels, which can stimulate algae growth, choking waterways and robbing fish of oxygen. When improperly used, chemical pesticides can also contaminate the food chain, causing long-term effects on wildlife and human health. Composting is a much more environmentally friendly way to control pests and keep your lawns healthy. Check out **WHO'S IN THE KNOW AND CAN TELL YOU MORE** to find out more about composting, native plants, and organic products.

If you choose to use chemical products, take care to use them safely and follow the directions! Use only non-toxic products in your garden. The same goes for the use of indoor chemicals – consider using nontoxic or natural cleaners. All unused chemical products, whether it is HHW from indoors or outdoors, should be recycled or disposed of properly. Many communities have begun to hold Household Hazardous Waste Collection events. Check out **WHO'S IN THE KNOW AND CAN TELL YOU MORE** to find out what is available in your local area. You can also find information on where to find alternative cleaning products. In addition, don't pour kitchen grease down the drain. Instead, put it into covered containers and throw it away in the trash. Rather than using a garbage disposal unit in the sink, scrape food scraps from dishes into the trash can or garbage bags. Food scraps can also be composted. Visit www.TexasFOG.org for more tips.

Next, take a look at how you take care of your vehicles. Properly maintain your vehicles to prevent oil and gasoline leaks. If you change the oil, don't dump the used oil on the ground – recycle it by taking it to a used oil collection facility! When used motor oil is disposed of improperly, it has a huge impact on our waterways, harming fish and wildlife. Check out **WHO'S IN THE KNOW AND CAN TELL YOU MORE** to learn more about recycling used motor oil and oil filters.

What Is The Bottom Line To What Is Happening Above The Ground?

It's simple. Non-point source pollution is everyone's problem because we all contribute to it. Follow the clues and do what you can to help minimize NPS. Help keep the Plum Creek Watershed and the Guadalupe River Basin clean!

Clues Above the Ground

What's Above the Ground Moves Around: Non-Point Source Pollution and Impervious Cover

When things like fertilizers, pesticides, automotive products, pet waste, grass clippings and some chemicals get caught up in runoff, they do not disappear quickly. They flow into creeks, rivers and lakes, harming plants and animals and contaminates the water we drink. The term for this is "Non-Point Source Pollution"(or NPS) because it comes from many different places, rather than a single source that anyone can 'point' to. NPS is more difficult to control because it comes from everyday activities, including fertilizing your lawn, using a pesticide, or constructing a new building. The clue to understanding NPS is to realize that everything that takes place in a watershed can affect our quality of water.

True or False? -- Factories are the Major Source of Pollutants in our Waters

False. Thirty years ago that statement was true. But, in recent decades, we've made a lot of progress reducing pollution from factories and wastewater treatment plants. Today, many of our water quality problems are often attributed to impervious cover (an area on land that does not allow water to percolate through naturally), even in suburban and rural areas. In a city, gutters that run along the curb of the streets are the drainage outlets for the watershed. Water from these gutters is diverted straight into a creek or stream. Comparatively, runoff within a small watershed of a suburban neighborhood likely flows directly into a nearby stream that may flow into a larger stream or river.

Why Do We Hear So Much About Impervious Cover?

In addition to the building of new structures, development practices often include paving over natural areas to make parking lots, driveways and roads. Impervious covers are a hindrance to water quality, because their non-porous surfaces make rainwater 'run off' quickly, instead of slowly soaking into the ground like it would have naturally. Rainwater gets caught up in runoff that often accelerates in speed as it travels over these hard surfaces. This rapidly moving runoff carries along whatever contaminants were on the ground, depositing them directly into the stream, river or lake. To make matters even worse, impervious cover and its associated runoff may be contributing to the frequency of flooding in our basin. Increased development and associated impervious cover are creating more non-point source pollution and are real concerns to water quality throughout the Guadalupe River Basin.

Many homeowners are gradually coming to the conclusion that a hands-off approach to landscaping is easier, cheaper, and less time intensive. You may want to consider using grasses that do not have the maintenance issues often associated with St. Augustine lawns, such as Zoysia, Bermuda or Buffalo grass. Or get rid of some of the grassy areas, by converting it into natural areas that use native Texas plants (commonly called 'xeriscape plants'). This will improve the quality of the runoff leaving your property because it eliminates the need for pesticides and fertilizers. Native landscapes also provide habitat for birds and animals. In addition, it frees up your time from mowing the lawn, and you don't have to water it much! When you do have to mow, leave the grass clippings on the lawn to provide natural fertilizer instead of blowing them into the street. You might also consider building a compost pile. Composting yard and food wastes is a great way to make your own organic fertilizer and reduce waste that goes into landfills. For information on composting see WHO'S IN THE KNOW AND CAN TELL YOU MORE. If you can't make your own, consider purchasing and using organic fertilizers – their footprints are minimal because they break down easily in the environment, as opposed to chemicals.

If You Use or Store Hazardous Wastes on Your Property, Take Care of It

As mentioned in FOOTPRINTS INSIDE THE HOUSE, you don't want to dispose of HHW by pouring it on the ground outside. These types of actions leave evident footprints – the residues of these products will potentially get caught up in the runoff, and could severely compromise the water quality downstream. While one resident's footprints alone may not have much of an impact, cumulatively it all adds to the deterioration of our water quality. Imagine all of your neighbors, as well as residents both upstream and downstream overapplying chemicals outside and illegally dumping HHW. Sooner or later, we all have to pay the costs.

Addressing HHW can be challenging, but not overwhelming. First, you should read the labels before you purchase a product. Make sure it is what you want and recognize what disposal issues you face when you are finished with it. Don't buy or use more than you need – follow the directions! If possible, use less toxic alternatives. And if you do have HHW lying about, make sure you properly store and dispose of it.

Check out CLUES UNDERGROUND and CLUES ABOVE THE GROUND to help you learn more about what to do with these types of wastes.

Footprints Outside the House

What's Underground Can Come Back Ground

"Out of sight, out of mind" is the typical attitude most of us have when it comes to flushing the toilet, draining the bathtub or running the dishwasher or washing machine. But all that used water (or "wastewater") goes somewhere. Twenty-four percent of American rural and suburban homes rely on septic systems to handle household wastes. Hopefully, if your home has a septic tank, you know how important it is to take care of it.

If Your Home Has A Septic Tank, What Do You Need To Know About It?

First, you should know what and where it is. A septic tank is an underground collection tank and system of outlying pipes that treat and dispose of household wastewater. A septic tank typically treats all the water used in your house: water from the sinks, showers and tubs, toilets, dishwashers and washing machines. The biggest concern is the wastewater from your toilets, which is full of harmful bacteria and microorganisms that can make people sick. Other wastewater produced in your home is considered to be graywater, and typically does not contain harmful bacteria. For information on the proper operation of your septic system, visit www.tceq.state.tx.us/nav/permits/on-site.html.

What Is Graywater?

Some conservation-minded homeowners now use water from sinks, showers, dishwashers and washing machines to irrigate lawns and landscapes. This water, called graywater, is collected separately from the toilet water (which is all directed to the septic tank). Graywater makes up 50-80% of residential wastewater. Using it outdoors does not leave footprints, and it makes sense – you can use the water you paid for twice! However, construction of a graywater system must comply with state rules and any requirements of the local permitting authority. Contact the Texas Commission on Environmental Quality for more information.

What Can You Do To Keep Your Waste From Escaping?

Septic tanks must be maintained in order to function properly. Septic systems rely on microscopic organisms to break down the organic wastes. Most important, sludge must be removed from the tank regularly (usually every 2-5 years). If not, the tank can fill with solids and overflow. When septic systems fail, untreated wastewater can enter and pollute nearby streams or pollute groundwater. This untreated wastewater carries nutrients that can cause an overgrowth in aquatic plants and algae, sometimes creating an algal bloom. Algal blooms can cause an oxygen imbalance, which can affect aquatic life.

Dumping hazardous chemicals (things like paints, varnishes, waste oil and pesticides) down your drain or toilet can cause a septic system failure by killing the microorganisms. Other items to keep out of septic systems include cleaners, medicines, plastics, diapers, condoms, coffee grounds, kitchen waste, cooking oil, and cat litter. If you are using a graywater system, you should not pour these things down the drain – it will end up directly on your yard, leaving footprints in the rainfall runoff.

What If Your Home Is Hooked Up To A Municipal Wastewater System?

Municipal wastewater systems rely on the same basic principles as septic tanks, but on a much larger scale and working in a much faster timescale. Treated wastewater from these systems is released back into the environment, either through a reuse application (like watering golf courses), or discharged directly into a stream, which eventually flows into a stream or river. Homes that are served by a municipal wastewater system should follow the same basic rules about what not to flush down the toilet or pour down the sink. In recent years, traces of medications have shown up in the waste stream. These chemicals and pharmaceuticals can have a negative impact on the microorganisms at work in the wastewater treatment plant.

What Do You Need to Know About Drinking Water Wells?

The good news is that as long as a septic system is properly maintained, there should not be any cross contamination between its drainfield and a well. The bad news is that toxic chemicals can contaminate wells through nearby leaking underground storage tanks or through improper disposal (dumping) of wastes like motor oil, degreasers, antifreeze or fertilizers. Improper application of chemical pesticides (such as fire ant killer) or herbicides could also release toxins into the groundwater. Overuse of fertilizers (both commercial & organic) may contaminate groundwater with high nitrate levels. Well owners should have their wells tested annually to check for harmful chemicals and bacteria.

What Is The Bottom Line About Clues To What Is Happening Underground?

It's really pretty simple. Even though you can't see what is happening underground, your footprints - or actions - can affect the quality of drinking water. This includes groundwater as well as surface water. The key is to properly maintain septic tanks, don't toss unused medications and chemicals out with disregard, and use fertilizers and pesticides in moderation. If you use hazardous chemicals, make sure you properly store and dispose of them. You can find more clues on how do to this by checking out WHO'S IN THE KNOW AND CAN TELL YOU MORE.

Clues Underground