

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 Guadalupe River Basin – together, we can preserve it as one of the most beautiful in Texas.

Watershed Awareness

Footprints Inside the House

Footprints Outside the House

Clues Underground

Clues Above the Ground

Stewardship: Top Ten Things You Can Do

Who's In The Know and Can Tell You More

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 one of the many sub-watersheds that make up the Guadalupe River Basin – one of the most beautiful 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 how clean the water in the river is, and this is water that is used by thousands of folks for drinking water. It is also used for agriculture, industry and recreation.

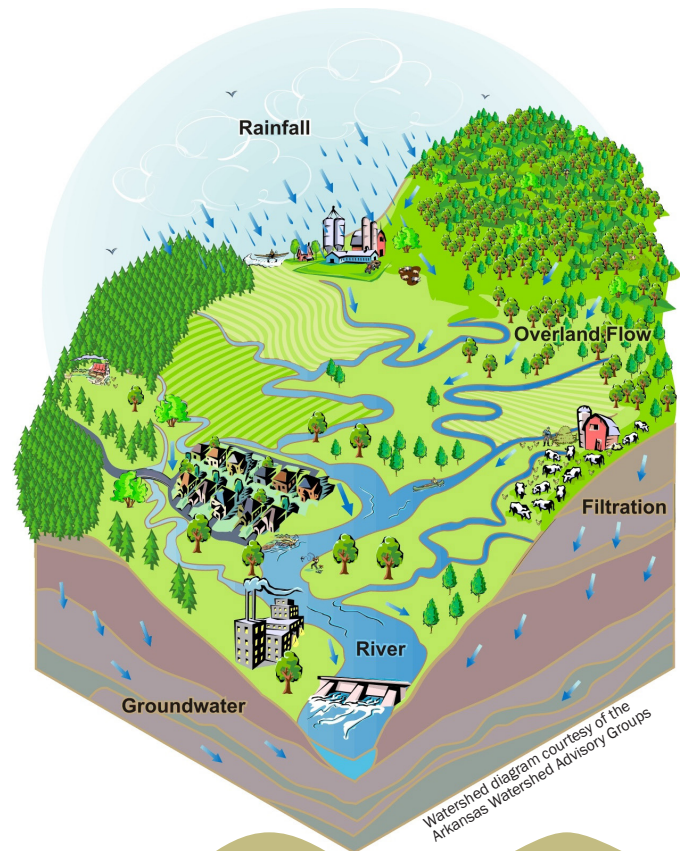
Now that we know about these “footprints,” what can you do to help preserve and protect your watershed?

Get to know your watershed—

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

Understand how your footsteps 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

Do's and Don'ts: Inside the House

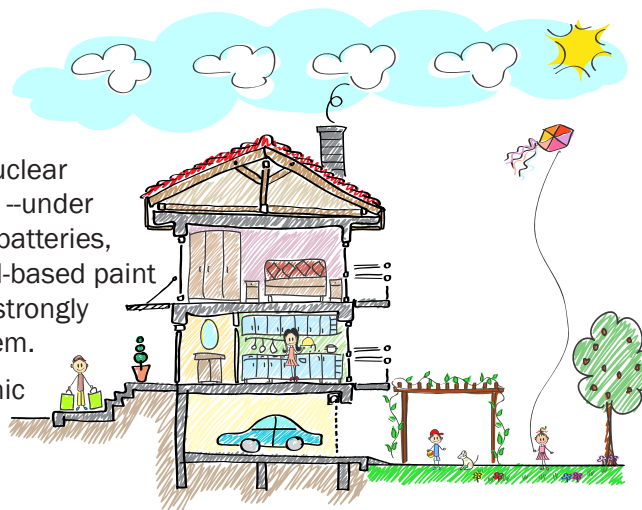
How do your actions indoors affect water quality outdoors?

Every household creates Household Hazardous Waste (HHW), which is one of the biggest 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 eventually end up in our creeks, streams, and eventually the rivers in our basin.

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 government feels so strongly about these items, that they have special rules for disposing of them.

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.



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.

Practice proper disposal 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. Landfills are not designed for these types of wastes, 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 alternative products for some of the things 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 any extra to dispose of. Also, only use the amount indicated on the label.

Reuse – If you have a product that is still 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.

Do's and Dont's: *Outside the House*

Your impact on water quality through your outdoor actions 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 Wastes – are not only found indoors!

Yes, its true – HHW can be found both INSIDE and OUTSIDE the house. A large percentage of it is either stored outside or applied to the ground. The average household contains between three and ten gallons of materials that are hazardous to human health or to the natural environment. 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.

Many homeowners are coming to the conclusion that a hands-off approach to landscaping is easier, cheaper, 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. You might also consider developing 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. 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 waste on your property, take care of it properly.

As mentioned in *FOOTPRINTS INSIDE THE HOUSE*, you don't want to dispose of HHW by pouring any on the ground outside. These types of actions leave evident footprints – the residues of things will 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 and follow the directions! If possible, use non-hazardous alternatives. And if you do have HHW lying about, make sure you properly 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.

What's Underground: Can Come Back Around

“Out of sight, out of mind” is a typical attitude that 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 of the water used in your house: water from the sinks, from the showers and tubs, toilets, dishwashers and washing machines. The biggest concern is the waste from your toilets, which is full of harmful bacteria and microorganisms that can make people sick. The other wastes produced in your home are considered to be grey water, and typically do not contain harmful bacteria.

What is grey water?

Some conservation-minded homes now use water from sinks, showers, dishwashers and washing machines to irrigate lawns and landscapes. This water, called grey water, is collected separately from the toilet water (which is all directed to the septic tank). Grey water makes up 50-80 percent of residential wastewater. Using it outdoors does not leave footprints, and it makes sense – you can use the water you paid for twice!

What can you do to keep your waste from escaping underground?

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, raw human waste can enter nearby streams or pollute the groundwater. This waste 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 animals.

Dumping hazardous chemicals (things like paints, varnishes, waste oil and pesticides) down the 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 and cat litter. If you are using a grey water system, common sense should tell you not to 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 of 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 river. Homes that are served by a municipal wastewater system should follow the same basic rules on what not to flush down the toilet or pour down the sink. These chemicals 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 chemicals such as pesticides (e.g., fire ant killer) could also release toxins into the groundwater. Overuse of fertilizers (both commercial and 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 water quality of drinking water. This includes groundwater as well as surface water. The key is to properly maintain septic tanks, don't toss 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 to do this by checking out WHO'S IN THE KNOW AND CAN TELL YOU MORE.

What's Above the Ground Moves Around:

Non-Point Source Pollution

When things like grass clippings, pet waste, automotive products, fertilizers, pesticides and other chemicals get caught up in runoff, they don't disappear. 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 different places, rather than a single source. NPS is 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 water.

False. Forty years ago that statement was true. But, in recent decades, we've made a lot of progress reducing pollution from factories and sewage treatment plants. Today, many of our water quality problems are often attributed to impervious cover (an area 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 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 contaminants that 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 a real concern to the water quality of the Guadalupe River Basin.

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, and faulty septic systems

What can you do to help minimize non-point source pollution?

First, take a look at what is in 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 dispose of it properly. 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. 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. Chemical pesticides can 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, use safe and approved chemicals, 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 properly disposed of or recycled. 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 happening in your local area. You can also find information on where to find alternative cleaning products.

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 – recycle it by taking it to a disposal 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 find out more about recycling your 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 Guadalupe River Basin clean!

Stewardship
Clues:

How to Be a Good 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 your 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 percent 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 conscious choices are indicators that you are well on your way to becoming a good steward of the river basin.

Here are the top ten things you can do to protect your watershed.

(Source: Center for Watershed Protection)

1.

Water only when and where it is really needed.
2.

Limit 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 system.
10.

Start or join a watershed organization.

a.

Learn more about your watershed and its unique qualities.

b.

Find out what the land development plans are for your area.

c.

Be involved in the future of your environment.



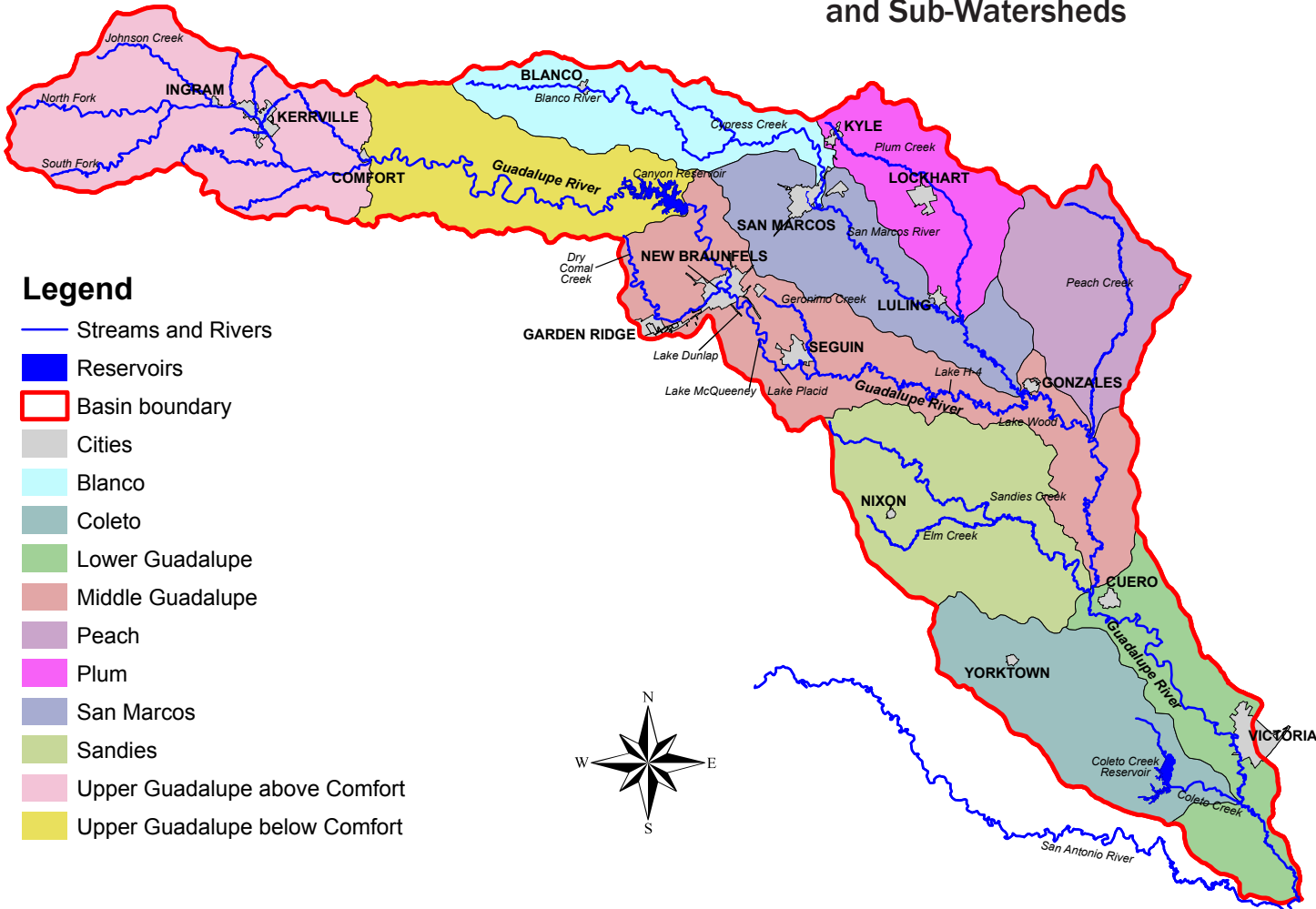
The watershed of the Guadalupe River Basin begins in the Texas Hill Country. It includes all of the land that drains into the Comal, Blanco, San Marcos and Guadalupe Rivers as the water makes its way to San Antonio Bay and the Gulf of Mexico. The Guadalupe River Basin is divided into four main watersheds: The Upper Guadalupe, Middle Guadalupe, San Marcos and Lower Guadalupe. These four are subdivided into 10 main segments, which are found on the map below.

To learn more about YOUR watershed, call the Guadalupe-Blanco River Authority and request a copy of the *Basin Highlights Report*. You can also take a look at a watershed puzzle on GBRA’s website at: www.gbra.org/education//watershedpuzzle/watershedpuzzle5a.swf

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 the larger watershed downstream. We all live “downstream.”

Guadalupe River Basin

and Sub-Watersheds



Who to Contact for More Information:

This is a sampler of the many places you can contact for more information about how to protect water quality. There is a wealth of information 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 find out what the water quality concerns are in the Guadalupe watershed and what you can do to make a difference.

Regional Resources

Guadalupe-Blanco River Authority - 830-379-5822 or 800-413-5822
www.gbra.org
Find out more about efforts to preserve, protect and conserve the Guadalupe River Basin.

Clean Rivers Program (Guadalupe River Basin)
www.gbra.org/crp/default.aspx
Find out more about the health of your river basin and its watersheds.

Texas Stream Team Water Quality Monitoring Program - 512-245-1346 or 877-506-1401
www.txstreamteam.rivers.txstate.edu/
You can volunteer to become a water quality monitor for your watershed.

State Agencies

Texas Commission on Environmental Quality - 512-239-1000
www.tceq.state.tx.us
TCEQ, the state environmental regulatory agency, sets policy for management of our air, water and waste. Their 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. You can find out about household hazardous waste collection events local to your area through this website or by calling the field offices.
Region 13 San Antonio Field Office 210-490-3096
Region 11 Austin Field Office 512-339-2929
Region 14 Corpus Christi Field Office 361-825-3100

Household Hazardous Waste – A Guide for Texans
www.tceq.texas.gov/p2/hhw/hhw.html
This 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 Information
www.earth911.com/
Information on HHW, recycling, & other topics (by ZIP code)

Clean Rivers Program - State of Texas
www.tceq.state.tx.us/compliance/monitoring/crp
The Clean Rivers Program is administered by the TCEQ. *Guadalupe River Basin Highlights Report*, routine water quality data and special studies are available on GBRA’s website at: www.gbra.org/crp/default.aspx

Texas Emergency Oil Spill and Hazardous Substance Reporting (24-Hour) - 800-832-8224
www.tpwd.state.tx.us/landwater/water/envirnoncerns/damage_assessment/response.phtml
Call if you are a witness to or are concerned about a possible oil or hazardous waste spill.

Federal Agencies

Environmental Protection Agency (EPA) - 800-887-6063 Region 6 (including Texas)
www.epa.gov
The EPA is the guiding policy and enforcement source behind TCEQ’s programs. The EPA’s website has an abundance of information on how to protect our precious water sources.

County Resources

Environmental and Health Services your county provides:

- | | |
|--|---------------------|
| Kendall County | 830-249-9343 |
| www.co.kendall.tx.us | |
| Comal County | 830-221-1150 |
| www.co.comal.tx.us | |
| Hays County | 512-393-2150 |
| www.co.hays.tx.us | |
| Guadalupe County | 830-303-4188 |
| www.co.guadalupe.tx.us | |
| Caldwell County | 512-398-1803 |
| www.co.caldwell.tx.us | |
| Gonzales County | 830-672-2327 |
| www.co.gonzales.tx.us | |
| DeWitt County | 361-275-0916 |
| www.co.dewitt.tx.us | |
| Victoria County | 361-578-6281 |
| www.victoriacountytx.org | |
| Refugio County | 361-526-4434 |
| www.co.refugio.tx.us | |
| Calhoun County | 361-552-9721 |
| www.calhouncotx.org | |

Conservation Resources

Native Texas Plants – Visit your local nursery to find out what plants are native to your region of Texas.
Native Plant Society of Texas
www.npsot.org

Composting and the Use of Organic Products
www.texasstar.org/index.php?pg=composting
www.aggie-horticulture.tamu.edu/earthkind/
www.tceq.texas.gov/p2/nav/composting.html

Alternatives for Household Cleaners
www.eartheasy.com/live_nontoxic_solutions.html



Aqua Phil uses these resources to obtain additional information. Did you know that the improper disposal of household hazardous wastes 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 and Can Tell You More



GBRA

Guadalupe-Blanco River Authority
flowing solutions

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



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