LOUISIANA DRINKING WATER PROTECTION PROGRAM

2019 newsletter

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PLASTIC POLLUTION: A HUMAN LEGACY OF TRASH

Image: Mark Benfield

It's just one straw…. said eight billion people. The more we learn the more we recognize that the issue of plastic pollution is severe and widespread. Plastics are everywhere. They are easily molded into a wide range of products from bottles and bags to computers and plumbing pipes. Most plastics are made from fossil fuels (oil) and do not react chemically with most other substances meaning they do not decay or biodegrade in the environment. It takes an average of 400 years for plastic to break down. Since 1950, plastic production has reached 8.3 billion tons with only 2.6 billion tons still in use. A mere 0.8 billion tons have been incinerated, leaving 4.9 billion tons discarded. Only an estimated nine percent of discarded plastic is recycled. Plastic debris comes in all shapes and sizes but those less than five millimeters in length (about the size of a sesame seed) are defined as "microplastics." The environmental impacts of microplastics is an emerging field of study. The following are common sources of microplastics:

- **Fragmentation of macroplastics.** Larger pieces of plastic are broken down over time by sunlight, waves, or other physical stresses. These include plastic bags, bottles, straws, cups, plates, cutlery, packaging, foamed plastic (styrofoam), fishing gear, the majority of which is single-use plastic. The largest sector of global plastic production (36%) is single-use material designed for immediate disposal…waste by design. They litter the environment due to irresponsible behavior and poor waste management. At least 5.25 trillion plastic particles weighing 268,940 tons are floating at sea.
- **Microbeads used in cosmetics and personal care products (facial scrubs, hand cleansers, toothpaste).** Plastic ingredients include polyethylene, polypropylene, polyethylene terephthalate, and nylon. The Microbead-Free Waters Act of 2015 bans the use of plastic microbeads in cosmetics and personal care products in The U.S.
- **Spillage of raw resin pellets.** Known as nurdles, they are the pre-production base of nearly all plastic products.
- **Laundering synthetic fabrics (microfibers).** Microfibers include polyester, nylon, acrylic, rayon/viscose, spandex/lycra, and fleece. Each garment in a load of laundry can shed more than 1,900 fibers, with fleeces releasing the highest percentage. Wastewater treatment plants cannot remove all of these fibers, which are released to the environment in the effluent.

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- **Bead blasting.** Beads of plastic are blasted at high pressure at machines, engines, or ships to remove rust or paint. They are often contaminated with heavy metals.
- **Paint flakes.** Sources include boats, road markings, and buildings.
- **Tire wear.** One car tire can shed up to 20 grams of plastic dust every 62 miles.
- **Mardi Gras beads and glitter.** Both are made of plastic and litter the streets of south Louisiana in large quantities during carnival season. They are washed into catch basins and end up in waterways.

So what are the consequences of plastic and microplastics? Plastic is the most common type of litter in the marine environment where it persists for a long time, adsorbs and releases toxins, and enters the food chain through fish, sea birds, and other marine life. Microplastics are hydrophobic (water replant) in nature and have a large surface area to volume ratio. These properties allow them to adsorb persistent organic pollutants, and become colonized with algae, which marine animals mistake for food. Over 100 million marine animals are killed each year from disease, suffocation, starvation (from stomachs full of plastic), and entanglement caused by plastic pollution. If nothing is done to combat the flow of plastic into waterways, scientists estimate by the year 2050 there will be more plastic in the oceans than fish by weight. The concentration of plastics in the Gulf of Mexico is among the highest in the world, with the majority of the plastic pollution being microfibers. Researchers hypothesize the culprit might be the Mississippi River which drains most of the large, densely populated cities in the central U.S., to the Gulf of Mexico.

Image: Oceanservice.noaa.gov

Plastic pollution extends beyond the marine environment; it's also found in food, drinking water, and air in the form of microplastics. Recent research suggests that humans may be consuming tens of thousands of microplastic particles a year. It's found in seafood, salt, sugar, honey, and even beer. A person's microplastics consumption depends on the food and drink choices they make. Numbers are likely higher in food or drink processed using plastics or packaged in plastics. For example, microplastics concentration is significantly higher in bottled water than tap water. Studies show that tap water can expose people to 3,000 – 6,000 microplastic particles a year, while bottled water can expose them to 64,000 to 127,000 particles per year if used as their only source of drinking water. Microplastics have been detected in rainwater and atmospheric dust, and have been identified in human lung biopsies. The extent to which microplastics effect human health is uncertain and is the subject of ongoing research. No standardized methodology exists to provide consistent, repeatable, and representative environmental samples to best understand the risk due to exposure to microplastics and associated toxicity.

There is no single solution to the microplastics problem but a good place to start is significantly reduce the use of single-use plastics such as water bottles, bags, straws, utensils, and containers. These are the most common types of plastic found in the environment and are used for a lifestyle of convenience, not necessity. Bans are becoming an increasingly popular way of reducing their use. Some lifestyle changes you can make to reduce plastic pollution include:

- Use stainless steel water bottles and refill with your favorite beverage.
- Skip the straw or use a metal straw.
- Cut out disposable plastic cutlery and cups whenever possible – use real tableware.
- Use reusable bags for groceries.
- Buy foods and other products, such as cleaning products, in bulk when possible to reduce packaging.
- Drink tap water instead of bottled water.

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- Buy natural fiber clothing such as cotton, linen, or wool whenever possible.
- For laundry, consider switching to a liquid detergent; powder "scrubs" and loosens more fibers. Also, use a colder setting; high temperature can damage clothes and release more fibers. A washing machine lint filter is an investment but in addition to keeping microfibers out of wash water, they also filter out pipe-clogging lint and pet hair.
- Get better at recycling. Rinse out containers to avoid contaminating plastics around them, sending all of it to a landfill. Avoid tossing plastic bags in recycling bins; they damage equipment. Many grocery and home improvement stores now have recycling bins to collect plastic bags. Now that it is no longer economical and China has stopped accepting our plastics for recycling, try to avoid buying plastics numbered 3-7. Many municipalities can no longer recycle them either.
- Do not litter! It's just one straw… said eight billion people!

COMMUNITY OUTREACH ACTIVITIES

LDEQ Geologist Jesse Means discusses how bugs indicate water quality at the annual Sparta Aquifer Fest in Lincoln Parish.

LDEQ Geologist Mary Gentry explains the permeability of aquifer materials at the annual Hurst Wetland Watchers Celebration in Norco.

(L-R) William Barlett, Brenda Rankins, Linda Piper, and Jesse Means work the LDEQ exhibit at the Annual Louisiana Municipal Association Convention in Monroe.

LDEQ Geologist Jesse Means explains how water flows through aquifers at the annual Iberville Parish Career Connections Fair in Plaquemine.

DRINKING WATER PROTECTION PROGRAMS 2018 - 2019

Bienville Parish. There are 23 active community public water systems in Bienville Parish. A community meeting was held on August 30, 2018 in Arcadia, LA. Attendees learned where their water comes from, why it is important to protect it and how they can protect it and also volunteered to educate facilities/businesses that are considered to be significant potential sources of contamination (SPSOCs) near public water wells. LDEQ provided volunteers with packets containing the location of the SPSOCs, material to distribute to personnel at each SPSOC, and instructions on conducting these educational visits. Volunteers were instructed on how to report changes to SPSOC information to LDEQ. One hundred twenty seven SPSOCs (visitable and non-visitable) were verified and 36 educational visits were completed. Committee meetings were devoted to further drinking water protection education. A representative from the Louisiana Department of Natural Resources gave a presentation on oil and gas regulations in the state.

Patrick Raley, LDNR, presents an overview of oil and gas regulations in Louisiana.

Cameron Parish. There are six active public community water systems in Cameron Parish. Due to the rural nature of the parish and small number of water systems no drinking water protection committee was formed. The drinking water protection team met and worked with the water systems, updated source water assessments, verified 132 SPSOCs (visitable and non-visitable), and visited 31 owners and operators of SPSOCs to educate them on best management practices.

LDEQ Geologist Shanna Mason shows examples of common SPSOCs.

Claiborne Parish. There are 13 active community public water systems in Claiborne Parish. A community meeting was held on December 6, 2018 in Homer, LA to educate the public on drinking water protection and solicit volunteers for a parish wide drinking water protection committee. LDEQ provided volunteers with packets containing the location of the SPSOCs, material to distribute to personnel at each SPSOC, and instructions on conducting these educational visits. One hundred twenty nine SPSOCs (visitable and non-visitable) were verified and 34 educational visits were completed. Committee meetings were devoted to further drinking water protection education. A representative from the Louisiana Department of Natural Resources gave a presentation on oil and gas regulations in the state. The Town of Haynesville adopted a ground water protection ordinance.

THE "INVISIBLE" UTILITY

The ease of turning on the tap and getting clean, safe, quality, affordable drinking water 24/7, 365 days a year has made water the most underappreciated precious resource on earth. If a water utility is doing a good job the operators at the facility become almost invisible; they are taken for granted as much as the resource itself. What many people don't realize is utilities are constantly working with aging infrastructure, low rates, and unappreciative consumers; yet it's utility workers that will spend Christmas day in a ditch fixing a line leak instead of being with their families. In many small towns, water operators are also responsible for the wastewater treatment system, roadways, and other town maintenance.

In addition to dedicated operators, water systems require money to operate – lots of it. Regulations are becoming stricter. Wells, tanks, pumps, piping, and treatment plants require maintenance and repairs. Electricity is required to run the system and chemicals are required to treat the water. There are administrative costs such as salaries and invoicing. Consumers are largely unaware of what it takes to operate a water system. How supportive will they be if they never stop to think about the infrastructure that brings

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water to their homes or the people who make it all work? The more people appreciate the operators who provide the service and the value of the service, the more likely they are to understand the cost and why rates may have to be raised to pay for system repairs or improvement.

For this reason, it's essential to demonstrate the value and necessity of public services. A public education plan can be quite beneficial to inform the public about water system issues and goals. There are more vehicles for press releases now than ever before via newspapers, websites, social media, and even water bills to educate consumers on how the water system operates. It can be in the form of simple messages such as how many wells the system operates and the water source, what treatment is required, and how many miles of pipe are maintained. Reporting the cost of these components or a planned repair or upgrade can help consumers understand what they pay for and why a rate increase is justified. Imagine their surprise when they find out that new water well cost $200,000 to drill! Press releases also provide an opportunity to recognize water system operators who work behind the scenes to keep the taps running. The preservation and advancement of a water system depends on the consumer's understanding of how the system works, what it costs to operate and maintain it, and appreciation of the people who operate it. Public education makes that information visible to the people who pay the bills.

ONSITE WASTEWATER TREATMENT SYSTEM MAINTENANCE CLASSES OFFERED TO LAFOURCHE PARISH RESIDENTS

According to the Louisiana Department of Health (LDH), approximately 500,000 on-site wastewater treatment systems have been permitted in Louisiana since 1980. That equates to a total volume of 150 million gallons of wastewater produced per day, enough to fill a 154-acre lake each day. If treatment systems are not properly maintained, they pose a risk to health and the environment.

Jesse Means, LDEQ Geologist, explains the impact of improperly treated wastewater on Bayou Lafourche.

In an ongoing effort to protect Bayou Lafourche from receiving improperly treated wastewater, treatment system maintenance classes were offered at no cost to homeowners in Lafourche Parish in December 2018. Funding for the classes was provided by the EPA Training and Technical Assistance for On-Site/Decentralized Wastewater Systems to Improve Water Quality Training Program, through the Louisiana Rural Water Association (LRWA). The classes were coordinated by LDEQ, LWRA, LDH, the Lafourche Parish Government, the Barataria-Terrebonne National Estuary Program, the Bayou Lafourche Fresh Water District, and Nicholls State University to educate local citizens on how to maintain their home wastewater treatment systems. Three classes were held in Matthews, Raceland, and Lockport, explaining the health and environmental impacts of improperly treated sewage, and the various types of wastewater treatment systems, their regulation, and proper maintenance. Field demonstrations were also conducted where attendees were shown the parts of an actual onsite wastewater treatment system and instructed on its operation and maintenance.

Properly maintained and operated wastewater systems:

- Save homeowners money
- Help protect public health
- Return clean water to the environment
- Help protect wildlife and waterfowl habitat
- Help protect recreational waters

LOUISIANA DRINKING WATER PROTECTION PROGRAM

TOWN OF HAYNESVILLE WINS LOUISIANA RURAL WATER ASSOCIATION AWARD

Accepting the award from Rusty Reeves, LRWA are Mayor Beverlee Killgore; maintenance supervisor, Dawson Beene; council members, Carla Smith, Linda Beene, Valinda Webb and Betty Richardson; and Jerry Smith

The Town of Haynesville received highest honors this year at Louisiana Rural Water Association's Annual Awards Banquet when they were named the Source Water Protection System of the Year. The awards were presented on July 17, 2019 at LRWA's 32nd Annual Training and Technical Conference held in Lake Charles, Louisiana.

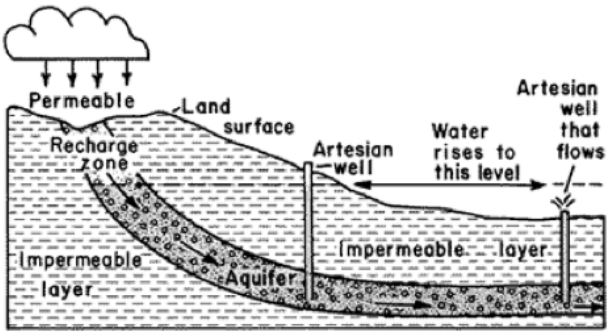
LRWA is a nonprofit organization established to aid small water and wastewater systems through training and on-site technical assistance. The LRWA Awards Program was established to recognize the outstanding efforts of Rural Water and Wastewater Systems and their personnel.

The Town of Haynesville completed all elements of a State Drinking Water Protection program including all elements of a working Source Water Protection Plan. Mayor Kilgore and employees were very active in hosting and participating in the Drinking Water Protection Committee meetings held in Claiborne Parish. The town also passed the Ground Water Protection Ordinance to further protect their drinking water sources into the future. Congratulations for outstanding efforts in protection of our drinking water sources.

ASK THE DWPP TEAM

Question: What are the risks of hard water?
Answer: Water hardness is dependent on the amount of dissolved minerals in the water, largely calcium and magnesium. Hard water is high in these dissolved minerals. Water is a great solvent for calcium and magnesium so if these minerals are abundantly present in the source such as an aquifer, hard water will likely result. Water hardness does not cause any adverse health effects and, in fact, may be a contributor of calcium and magnesium in the diet. However, hard water is not very efficient for other uses and can be a nuisance. In hard water, soap reacts with calcium and forms "soap scum," which is difficult to clean. Because of this reaction, more soap or detergent is needed to get things clean, be it your hands, hair, laundry, or dishes. One of the most common causes of cloudy dishes and glassware is hard water. When hard water is heated, solid deposits of calcium carbonate more commonly known as "scale" can form. Scale can reduce the life and lower the efficiency of equipment such as water heaters, clog pipes, and raise the cost of heating the water. It can also build up in small appliances such as coffee makers, which can be cleaned with vinegar (an acid) to dissolve the minerals. According the U.S. Geological Survey, general guidelines for classification of waters are: 0 to 60 mg/L (milligrams per liter) as calcium carbonate is classified as soft; 61 to 120 mg/L as moderately hard; 121 to 180 mg/L as hard; and more than 180 mg/L as very hard. Commercially available water softener units can remove the minerals that cause hard water.

Question: What is the difference between artesian well water and other well water?
Answer: There is no difference in the water chemically or physically, only the way it gets to the land surface. Groundwater in aquifers between low permeability rock or sediment, such as shale or clay, is confined under pressure greater than atmospheric pressure. If these aquifers, known as confined or "artesian" aquifers, are tapped by a well, water will rise above the top of the aquifer and may even flow onto the land surface. Not all artesian wells are flowing wells. If water flows onto the surface without the use of a pump the well is known as a "flowing" artesian well. Excessive groundwater withdrawal over time may cause the pressure in the aquifer to drop and flowing artesian wells may stop flowing freely.



Artesian Aquifer: Cross-section showing an aquifer tapped by artesian wells. Pressure within the aquifer forces water up the wells. The well on the right side of the diagram is a flowing artesian well that yields water without pumping. The artesian well on the left has a water level that is higher than the top of the aquifer; however, it is not a flowing artesian well. USGS Image.

LOUISIANA DRINKING WATER PROTECTION PROGRAM

THE DRINKING WATER PROTECTION TEAM SALUTES MUNICIPALITIES AND PARISH GOVERNMENTS WHO HAVE ADOPTED A GROUNDWATER PROTECTION ORDINANCE (AS OF 9/30/2019):

Acadia
Acadia Parish Police Jury
Town of Church Point
City of Crowley
Town of Iota
City of Rayne

Allen
Town of Elizabeth
City of Oakdale

Avoyelles
Avoyelles Parish Police Jury
City of Marksville
Town of Mansura
Town of Moreauville
Town of Simmesport

Beauregard
City of DeRidder
Town of Merryville

Bossier
Bossier Parish Police Jury
Town of Haughton
Town of Plain Dealing

Calcasieu
City of DeQuincy
Town of Vinton
City of Westlake

Caddo
Village of Ida
Village of Rodessa
Town of Vivian

Caldwell
Town of Columbia

Catahoula
Village of Harrisonburg
Town of Jonesville

Claiborne
Town of Haynesville

Concordia
Concordia Parish Police Jury
Town of Clayton
City of Vidalia

East Feliciana
Village of Norwood
Town of Wilson

Evangeline
Village of Pine Prairie

Grant
Town of Pollock

Iberia
Village of Loreauville

Iberville
Town of Maringouin
Village of Rosedale
Town of White Castle

Jefferson Davis
Jeff. Davis Parish Police Jury
City of Jennings
Town of Lake Arthur
Town of Welsh

Lafayette
City of Carencro
Town of Duson
City of Youngsville

LaSalle
Town of Jena
Town of Olla

Lincoln
Lincoln Parish Police Jury
City of Grambling

Livingston
Village of Albany
City of Denham Springs
Village of Killian
Town of Livingston
City of Walker

Morehouse
City of Bastrop
Village of Bonita

Natchitoches
Village of Goldonna

Ouachita
City of West Monroe

Rapides
Village of Cheneyville
Town of Glenmora
Town of Lecompte
Village of McNary
Town of Woodworth

Richland
Town of Mangham
Town of Rayville

St. Landry
St. Landry Parish Council
City of Eunice
Town of Melville
City of Opelousas
Town of Washington

St. Martin
City of Breaux Bridge
Town of Henderson

St. Tammany
Town Abita Springs
Town of Madisonville
City of Slidell

Tangipahoa
Town of Amite
Town of Kentwood
City of Ponchatoula
Village of Tangipahoa
Village of Tickfaw

Tensas
Town of St. Joseph

Vermilion
Vermilion Parish Police Jury
City of Abbeville
Town of Delcambre
Town of Erath
Town of Gueydan
Town of Kaplan
Town of Maurice

Vernon
Vernon Parish Police Jury
Village of Anacoco
Town of Hornbeck
City of Leesville
Town of Rosepine
Village of Simpson

Washington
Town of Angie

Webster
Webster Parish Police Jury
Town of Cullen
City of Minden
Town of Sibley
City of Springhill

West Baton Rouge
Town of Addis

West Feliciana
Town of St. Francisville

Aquifer Evaluation and Protection Unit
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LOUISIANA DRINKING WATER PROTECTION PROGRAM

2019 newsletter

The Drinking Water Protection Team is a part of the Aquifer Evaluation and Protection Unit within the Water Planning and Assessment Division. This Division is under the Office of Environmental Assessment at the Louisiana Department of Environmental Quality. Drinking Water Protection Team members educate the public about the importance of protecting drinking water sources. The team plays a vital role in working with Louisiana communities to establish local drinking water protection programs. The team is available to give presentations on water protection issues to your school or organization. Please call 225-219-3510 for more information.

This newsletter and all previous issues are available online at: www.deq.louisiana.gov/resources/category/drinking-water.

WE LOOK FORWARD TO HELPING YOU PROTECT YOUR COMMUNITY'S DRINKING WATER!

This project is funded, in full or in part, by the United States Environmental Protection Agency (USEPA).

VISIT US AT WWW.DEQ.LOUISIANA.GOV/AEPS