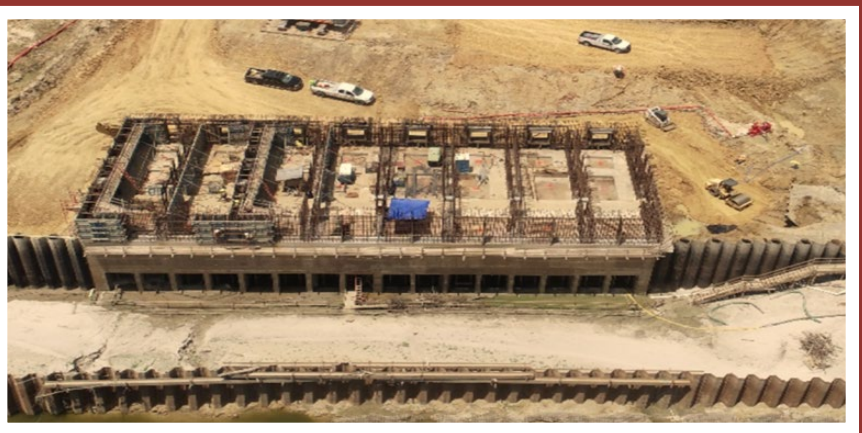
WATERLINES

NORTH HARRIS COUNTY REGIONAL WATER AUTHORITY



North Harris County REGIONAL WATER Authority

WINTER 2020

North Harris County REGIONAL WATER Authority

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The North Harris County Regional Water Authority (NHCRWA) was created by the 76th Texas Legislature and was confirmed by a public vote in January 2000. The primary mission of the NHCRWA was to secure adequate surface water and develop a system to facilitate the transition to surface water in compliance with the Harris-Galveston Subsidence District's mandated groundwater reduction timeframe.

WATER FACTOIDS

The United States has an abundance of water, and is home to the largest freshwater lake system in the world – the Great Lakes, which hold 6 *quadrillion* gallons of water (that is a 6 followed by 15 zeros!). Texas, on the other hand, has significant water resources but they are not neessarily where they are needed!

With 4.5 percent of the world's population, the U.S. has 8 percent of the water on the planet.

At the mouth of the mighty Mississippi in New Orleans, the river flows at 4.5 million gallons per second and supplies drinking water to about 15 million people.

Here are some more astonishing facts about this amazing liquid…

- More than 25 percent of bottled water comes from a municipal water supply – *the same place that tap water comes from*.
- Approximately 400 billion gallons of water are used in the U. S. every day.
- If all the water vapor in the Earth's atmosphere fell at once, and were evenly distributed, it would only cover the Earth with about an inch of water.
- America uses nearly half of its water for thermoelectric power generation.
- It takes more than seven years for the average U.S. residence to use the same amount of water that flows over Niagara Falls in just *ONE SECOND* (750,000 gallons).
- Water can dissolve more substances than any other liquid.
- A gallon of water weighs 8.34 pounds.
- At one drip per second, a faucet can leak 3,000 gallons per year!

SECURING OUR FUTURE WATER SUPPLIES

Fortunately, looking toward the future, the Houston region can rely on the surface water resources secured more than 50 years ago with the construction of the water storage reservoirs fed by the San Jacinto and Trinity Rivers.

It is important to note that the City of Houston has over 1.2 billion gallons per day of reliable surface water rights -- a 70 percent share of Lake Livingston, a two thirds share of Lake Conroe, 100 percent ownership of Lake Houston, and a 70 percent share of the future Allens Creek Reservoir. That, combined with its groundwater supply, is enough to serve customers in the city and surrounding counties through approximately 2050 and beyond.

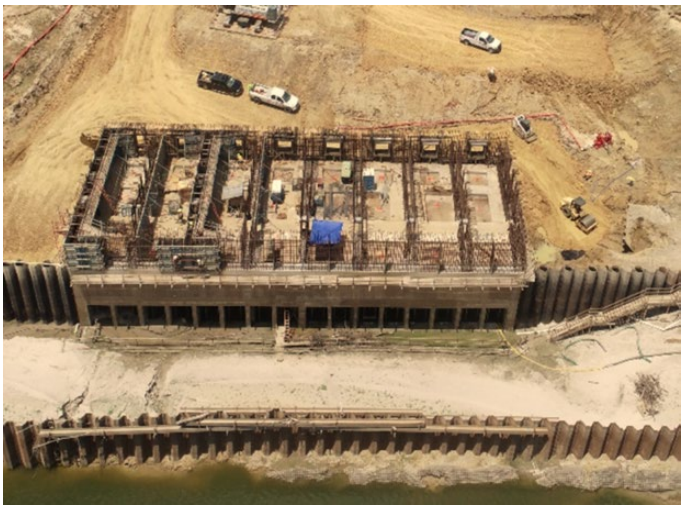
The key to meeting future demand is tapping into some of the *unused water supply* on the Trinity River and getting it to where it is needed most – in west, central and north Harris County and north Fort Bend County. That involves constructing new pipelines, pump stations and expanding the water treatment plant capacity.

The idea for the **Luce Bayou Interbasin Transfer Project** dates back to the late 1930s, when Houston leaders realized the need to identify water sources for future Houstonians and began planning for the use of surface water..

The Coastal Water Authority (CWA), a conservation and reclamation district created by the State in 1967, is managing the project. In its role as the City of Houston's untreated surface water provider, the city owns the water and CWA builds, operates and maintains the systems -- and gets the water where it needs to go.

The City of Houston, the North, West and Central Harris County Regional Water Authorities, and the North Fort Bend Water Authority are partners in Luce Bayou, with each paying their fair share for equipment and pipelines that will treat, transport and deliver the water from Lake Houston to points beyond.

With the prospect of more untreated water coming into the Lake Houston reservoir, the "partners" are working together on an expansion of the **Northeast Water Purification Plant (NEWPP)**, again sharing the costs. This multi-billion dollar project -- to be accomplished in phases over the next 4 to 6 years -- will increase the treatment capacity to 400 million gallons a day.



LUCE BAYOU INTERBASIN TRANSFER PROJECT - CONSTRUCTING THE CAPERS RIDGE PUMP STATION ON THE TRINITY RIVER

LUCE BAYOU INTERBASIN TRANSFER PROJECT - BRINGING WATER FROM THE TRINITY RIVER TO LAKE HOUSTON

NORTHEAST WATER PURIFICATION PLANT EXPANSION PROJECT -- 2019

WATER FOR OUR COMMUNITY...

SECOND WATER TRANSMISSION LINE FROM THE NEWPP

Continuing their current 84-inch Northeast Transmission Line, the Authority is partnering with the City of Houston to construct an additional 16.5 miles of pipe to deliver 113 MGD of treated water from the NEWPP to the new SH 249 Regional Pump Station and storage facility. This includes 2200 ft. of a 120 inch line -- that's 10 ft. in diameter. Another segment, shared with the Central Harris County Regional Water Authority, will be 9 ft. in diameter and almost 8 miles long. These huge pipelines are big enough to drive a truck through.

NHCRWA 2025 INFRASTRUCTURE COSTS -- Est. $878M (2019 dollars)

In addition to the "partnered" construction projects previously described, the NHCRWA will also incur costs to build more infrastructure to receive and deliver water treated at the Northeast Water Purification Plant (NEWPP) to the MUDs/water providers within the Authority's boundaries. This includes two major pump stations and constructing an additional 94 miles of transmission and distribution lines to connect another 45 MUDs.

Every Drop Adds Up!

By Kathleen Jackson, Board Member, Texas Water Development Board

At the end of September, just a few weeks after Tropical Depression Imelda dropped more than 40 inches of rainfall in parts of southeast Texas, approximately 48 percent of the state was in drought. That's 10 percentage points more than in August. According to the U.S. Drought Monitor's October 1 map, approximately 46 percent of the state was in drought at the time this article was published.

How can that be, when so many Texans are hurting from yet another instance of too much water? How can we even think about having too little water after such an event? It's a pattern seen throughout history: Texas is a state of perpetual drought punctuated by times of flood. Because of the vast size of our state and the diversity of our climate, Texans are almost guaranteed the constant contradiction of simultaneous flood and drought. That is why the state must address them concurrently. We must continue to plan for the next drought and for our future water supply needs even when recovering from floods.

The 2017 State Water Plan tells us that Texas faces significant water shortages over the next 50 years if steps are not taken to conserve and develop additional water supplies. Rapid population growth is expected and along with it, water demands. Texas' existing water supplies—those that can already be relied on in the event of drought—are expected to decline.

As we've said before and we'll no doubt say again, ***there is no new water to be created on Earth.*** The water available to us now is the same water that was here thousands of years ago and the same water that will be used by generations to come.

The easiest and most cost-effective way to help ensure we have enough water for the future is to conserve the water we currently have. That's where everyone in Texas comes in.

Perhaps you're thinking, "Can I really make a difference as one person?" Yes, you can! Besides, if everyone does a little, it adds up to a BIG difference for our state! There are many ways to conserve water, several of which are small changes that we can all make in our daily routines.

One easy option is to shorten shower time. Did you know that reducing your shower from 10 to 5 minutes could save approximately 12.5 gallons per shower with an efficient showerhead? That's more than 4,500 gallons a year! Consider this:

If you and 24 family members, friends, or neighbors each made this change, it would add up to more than 100,000 gallons per year. That's well over *a million* 12-ounce cans of your favorite beverage.

Or, put another way, currently in Texas, the average annual per-person water use is approximately 59,495 gallons a year.[1] That shorter shower by 25 people just created enough water for

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Every Drop…*Continued from page 5*

more than one person for an entire year. Imagine the difference it would make if our entire population of 28 million shortened their showers.

To put this into perspective, the state has estimated that by 2020 it will need to save 72,990,720,743 gallons through municipal conservation to meet the water needs of residents. That amount quadruples in 50 years. And everyone can help us meet those goals.

So, how else can you save water as you go about your daily activities? We're glad you asked. And no, you don't need to give up your morning coffee! Here are a few ideas, some of which you may already be doing:

- Turn off the tap when brushing your teeth.
- Install water-efficient appliances.
- Check your toilet and fixtures for leaks.
- Water your yard in the morning or late evening.
- Run the dishwasher, rather than washing dishes by hand.

In addition to individual efforts, communities across Texas recognize the importance of conservation and efficiencies in their water operations. For example, some utilities have incorporated advanced metering infrastructure into their systems, offering the ability to monitor meters in real time to obtain more accurate data on water usage throughout the system. This means that leaks and water loss in the distribution network can be detected earlier, helping utilities conserve water and money.

Reuse is another way communities are making smart use of their water supply. Water reuse generally refers to the process of using treated wastewater (reclaimed water) for a beneficial purpose. The degree of treatment depends on the proposed use for the water. Examples of water reuse include irrigation, cooling, and augmenting water supplies.

We can all play a part in reducing water use and making smart decisions to help ensure this critical resource will be available for generations to come and in times when Texas needs it most. A few drops from a leaky faucet or five minutes of shower time may seem insignificant, but every drop adds up.

[1] According to data provided in the 2017 State Water Plan

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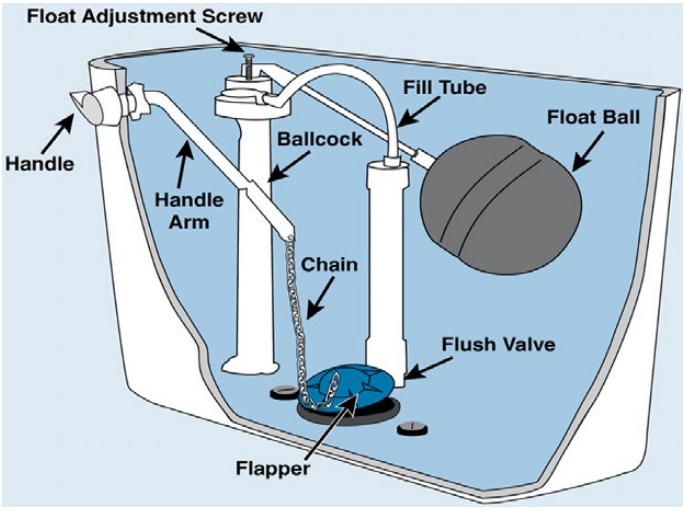
Halloween is long past, but at all times of the day and night, a strange noise invades the silence at your house...it wakes you from sleep or sends you chasing around in search of the annoying source. The noise is not predictable...it doesn't have a regular schedule but comes and goes. It sounds like someone turning on a hose outside... like water briefly rushing through a pipe...and then its gone again.

Finally, you just happen to be in the bathroom when, there it is. There's no one there, but the toilet is flushing itself. No, it isn't that famous cat that drove its owners nuts by repeatedly flushing the toilet causing an outrageously high water bill. Yours is a phantom flush...you're the only one there to hear the *flush* echo around the empty bathroom.

Now that you've solved the mystery, what can you do to make it stop?

The best place to start is to understand the way a toilet works. When you push the lever for a flush, the water in the tank rushes into the bowl. As the water in the tank drains, the water level recedes and finally gets low enough for the float to activate the fill valve, which triggers the tank to refill again.



While this process is going on, as the levers cause the water to come and go, the sounds are familiar and reassuring; the toilet is performing as expected. A toilet that cuts on and off by iteslf, or runs intermittently, on the other hand, has a problem that plumbers call a "phantom flush".

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GHOST TOILET LEAKS...

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A toilet that seems to flush all by itself usually has a slow leak from the tank to the bowl. The water level drops below a certain point, so the float signals that the tank needs to be refilled...which causes the flushing sound as it adds more water. This is usually caused by a deteriorating *flapper* or *flapper seat* (see diagram).

This annoying -- and costly -- problem can usually be fixed without calling a plumber. Here's a place to start the "diagnosis".

Lift the lid on the tank and put a few drops of food coloring in the tank, and don't flush the toilet for about 30 minutes. If this color starts seeping into the toilet bowl, you'll know the flapper is leaking.

One thing you can try is to lengthen the chain holding the flapper to the flush handle by one or two links. When the chain is too short, it prevents the flapper from "seating" in the syphon hole and can cause the type of slow leak that produces the phantom flushing. Repeat the dye test, and if the water changes color again, replace the flapper.

Turn off the water supply and hold down the flush handle to empty the tank. Remove the old flapper by disconnecting it from the chain and unhook its two "ears" from the overflow tube. Take it with you to the hardware store to make sure that you purchase an identical replacement. Follow the instructions to install the new flapper -- making sure the chain has enough slack for the flapper to fully seat. If you're satisfied that everything is working properly, repeat the dye test. Test flush the toilet a few more times before you put it back in service.

Always find and fix toilet leaks...they waste water and money!

Introducing the Authority's Water Quality Mobile Teaching Lab and MIZ WATERLADY!

The NHCRWA has a new mobile attraction that has been featured at special events hosted by a variety of MUDs. Visitors learn about the critical issues of Stormwater Pollution and how to avoid it; Patty Potty's NO WIPES IN THE PIPES Campaign that teaches people about what shouldn't be flushed down toilets; proper disposal of F.O.G. -- Fats, Oil and Grease; the importance of "*Scooping the Poop*" (cleaning up after your dog); and a display about various careers in "WATER".

MIZ WATERLADY hosts this fun and informative venue, shares helpful handouts, and answers questions. Her team staffs a series of related games with prizes for the winners. Miz Waterlady and the Mobile Lab are available to ISDs and MUDs within the NHCRWA boundaries. There is a reservation form on the Authority's website (www.nhcrwa.com).

WHY DOES THE COST OF WATER KEEP GOING UP?

Decades before **WATER** became the global issue that it is today, the state of Texas had begun taking aggressive measures to preserve and protect this finite natural resource. In fact, The Lone Star State is recognized as having one of the most comprehensive state water plans in the nation. That's a good thing because a staggering number of businesses and people relocate to Texas every year.

The 2010 census recorded a population of just over 600 thousand for the northwest Harris County area alone. Experts now forecast that the state's population will increase more than 70 percent between 2020 and 2070, from 29.5 million to 51 million. Over half of this projected growth will occur in the Dallas-Fort Worth and Houston metropolitan areas.

Each year, the ***Texas Water Development Board*** collects information on water usage and comprehensive population projections from water systems around the state. The ***State Water Plan*** – produced every five years — provides a critical roadmap for our long-term planning.

Will we have enough water to meet the needs of our growing population and to sustain economic growth and development for future generations? The answer is a cautiously optimistic "Yes".

How do we know? Let's go back 40 years or so for a quick science lesson…

For decades, drinking water for much of southeast Texas traditionally came from the Gulf Coast Aquifers – which is made up of many layers of clay, rocks and sand. Over geologic time, these layers naturally compact…and collapse underground — never to be restored. Sadly, the area's steadily increasing population and voracious thirst for water sped up this natural process. Aggressive groundwater pumping not only resulted in a decline of the underground aquifers, but also triggered land surface elevation loss, or what is called subsidence, throughout the region.

The **Harris-Galveston Subsidence District** (HGSD) was created by the Texas Legislature in 1975 to study and control subsidence in Harris and Galveston counties. The District issued a regulatory plan requiring industries on the Houston Ship Channel to convert from groundwater to surface water. The results were dramatic — subsidence in the Baytown-Pasadena area was dramatically improved, and has since been largely halted.

The combination of subsidence in northwest Harris County and evidence that aquifers were beginning serious decline, confirmed the need to convert to surface water. Based on the success of their initial effort, the Subsidence District took a similar approach in north and west Harris County. The first phase of the District's mandate was completed in 2010, which reduced reliance on groundwater by 30 percent. The next deadline is 2025 – requiring 60 percent conversion to alternate (or surface) water.

Back in the 1950s, some visionary Houston officials understood that achieving the city's future economic potential hinged on securing the rights to nearby surface water resources. Their foresight led to the construction of three man-made lakes as water storage reservoirs – Lake Houston, Lake Livingston and Lake Conroe — fed by the San Jacinto and Trinity Rivers.

Fortunately, the Houston region can now rely on the surface water resources secured all those years ago. But, there are some hurdles ahead, however, because there is not enough water in the San Jacinto River system to meet our 2025 needs and beyond.

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RISING COST OF WATER...

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So, where will these future supplies come from...and how will we pay for them?

Since its creation by the Texas Legislature in 2000, the North Harris County Regional Water Authority has complied with the HGSD's groundwater reduction mandates, and is also responsible for building the water pipelines to deliver treated water to the municipal utility districts (MUDs) to serve hundreds of thousands of residents...and that's no small task. The current challenge is to complete the planning and engineering stage of the multi-pronged 2025 conversion system.

A new alliance of regional water providers have teamed up to initiate the **Luce Bayou Interbasin Transfer Project** with the capacity to bring raw water from the Trinity River to Lake Houston and the City's North East Water Purification Plant. The partners include the City of Houston, the North, West and Central Harris County Regional Water Authorities, the North Fort Bend Water Authority, and the Coastal Water Authority.

Construction on the 90-acre ***Capers Ridge Pump Station*** on the Trinity River's west bank is well underway. When fully functional, it will be able to divert up to 500 million gallons of water a day from the river and pump it into side-by-side underground pipelines. To provide an idea of the size of these pipes, a pickup truck could drive through these 8 foot diameter pipes with room to spare. The water will flow through these pipelines to a storage and sedimentation basin, and then into a canal that runs to the northeastern tip of Lake Houston.

In anticipation of more raw water coming into the San Jacinto/Lake Houston reservoir, regional water authorities and the City of Houston forged a partnership to accomplish an expansion of the ***Northeast Water Purification Plant*** with each paying its fair share of the costs. This multi-billion dollar project — to be completed in phases over the next 4 to 6 years — will increase the treatment capacity from the current 80 million gallons a day to 400 million gallons a day. *The expansion project is considered to be the largest design-build project of its kind underway in the U.S. today.*

In addition to the cost of purchasing the surface water from the City of Houston, there are shared transmission, operations and maintenance expenses to be paid. All of these factors — coupled with the cost of constructing the NHCRWA's 2025 water supply system — will impact the future cost of water.

How will we pay for it? The NHCRWA was not given taxing authority when it was created by the State Legislature. Instead of taxes, fees are charged for groundwater pumped by the utility districts and their customers within the Authority's boundaries. They are also charged for the delivery of surface water. There have been numerous bond sales over the past 18 years to fund the 2010 distribution system and other construction and operating costs. While the Authority has pledged to *keep the fees as low as possible, for as long as possible*, we know that the cost of water will continue to go up in the future.

In November 2013, Texans had the opportunity to vote for a constitutional amendment creating the **State Water Implementation Fund for Texas (SWIFT)** to assist in financing priority projects in the state water plan to ensure the

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availability of adequate future water resources. They did so overwhelmingly.

This election signaled the State's new approach to turning water plans into water supplies. **SWIFT** — administered by the Texas Water Development Board — enabled municipalities, counties, water authorities and other water providers to apply for the low interest loans. With assistance from the SWIFT program, Texas now has the means to help meet the state's water needs far into the future.

Since their initial application was accepted by TWDB in 2015, the NHCRWA has been one of the largest recipients of subsidized, multi-year funding through the SWIFT Program in the state! The TWDB estimates the Authority has received savings to date of over $237 million by utilizing the SWIFT Program; comparing TWDB's AAA Bond Rating vs. rates the Authority would expect to receive in the open market.

The North Harris County Regional Water Authority will continue to work with other regional water providers to provide a secure, long term supply of potable water for our neighbors and community. In the meantime, it is up to each of us to use our finite water resources wisely.

Q. What are the "fees" that appear on my water bill?

A. The NHCRWA "fee" is charged to the MUDs/Well Owners within the Authority's boundaries based on the amount of groundwater pumped by their wells, and/or the amount of surface water they receive from the NHCRWA. The MUDs charge their individual customers for the water they use. The more water a customer uses, the higher the fee will be.

While not all water bills look exactly the same, most of the information they contain is similar. On some part of the bill, there will be a breakdown of costs incurred during the last billing cycle -- broken down into charges for "Water", "Sewer", and the "Regional Water Authority".

The Water and Authority items are based on the amount of water used (measured in thousand gallon increments), while the Sewer can be a flat monthly fee or it, too, can be based on water usage. Depending on the water provider, there may also be fee entries for "trash collection", "recycling", or other items approved by their Board of Directors.

All MUDs would prefer to be able to account for 100% of the water distributed through their system, including the ground-water pumped from their wells and surface water purchased from the Authority that all goes through the residents' meters. This is not always possible. In addition to residential and commercial water customers, community water uses also include common areas (esplanades, amenity lakes or ponds, etc.) and emergency services/fire that require variable amounts of water from month to month. A utility district may add a surcharge to the fee so the "RWA" fee on your water bill may appear to be more than what the Authority charges. Please contact your district for the explanation for the surcharge.

Q. How often does the Authority increase the fee?

A. Fee increases are imposed only as necessary. Without taxing authority, funding for construction projects must come from pumpage fees and water sales. There will be more rate increases in the future; however, *the Authority is committed to keeping the price as low as possible...for as long as possible.*

Q. What are the Authority's current ground- and surface water fees?

A.
- $3.85 per 1,000 gallons for groundwater
- $4.30 per 1,000 gallons for surface water.

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We're securing future water supplies so when today's youngsters grow up -- and have families of their own -- water will be there when they turn on the faucet!

Where will their water come from?

BE A WATER HERO! USE WATER WISELY.

The water we conserve today can serve ~~us~~ them tomorrow!

An Important message from the Save Water Texas Coalition - savewatertexas.org

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