North Harris County Regional Water Authority

WATERLINES

SPRING 2015

The water we conserve today can serve us tomorrow!

WATER FOR THE FUTURE...

Where will it come from and how will we pay for it?

Long before water became a global issue, Texas began taking concerted measures to preserve and protect this finite natural resource. As far back as the 1950s and '60s, experts were studying the impact of excessive withdrawals of groundwater and the occurrence of subsidence. **The Gulf Coast Aquifers** – the source we traditionally relied upon for our drinking water – are made up of many layers of clay, rocks and sand. Over geologic time, these layers naturally compacted. As the area's population steadily increased, its voracious demand for water accelerated this natural process. Decades of aggressive groundwater pumping not only resulted in a decline of the aquifers, it also triggered land-surface elevation loss, called **subsidence.**

In 1975, the **Harris-Galveston Subsidence District (HGSD**) was created by the 64th Texas Legislature specifically to address subsidence problems. This special purpose district immediately began to develop and implement a Groundwater Regulatory Plan. Its success reining in subsidence by conversion to surface water in Galveston County and southeast Harris County provided the impetus to extend similar groundwater reduction mandates into north and west Harris County, where increasing levels of subsidence had also been measured.

On June 18, 1999, the North Harris County Regional Water Authority was created by the 76th Texas Legislature to represent the municipal utility districts (MUDs) within its boundaries in complying with the HGSD's 1999 Plan mandates. In a special election on January 15, 2000, voters confirmed the Authority's creation and elected a board of directors to lead it. The Authority successfully negotiated a 40-year Water Supply Contract between the City of Houston, Texas and the North Harris County Regional Water Authority **(***the Original Contract***)** effective December 16, 2002.

Under terms of the Original Contract, the Authority acquired 31 MGD (million gallons a day) of raw untreated water (e.g. Lake Houston). After performing certain obligations, the Authority acquired 31 MGD of water treatment space in the City of Houston's water treatment facilities on Lake Houston. In addition to providing for the initial 31 MGD of treated water, the original contract set forth a procedure

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WATER FOR OUR FUTURE...

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by which the Authority could purchase *additional allocations* to meet future surface water needs.

The Authority's Groundwater Reduction Plan (GRP) was subsequently approved and accepted by the the Subsidence District. Shortly thereafter, design and construction of the transmission lines and facilities that would be part of an entirely new water infrastructure began.

Other area authorities executed contracts with the City of Houston containing similar provisions, but with different demand allocations...in some cases, from different treatment facilities. If expanded facilities would be required to provide the additional demand allocations, the City of Houston would construct the necessary facilities and the affected authorities would pay their prorated cost of such facilities.

First Supplement to the Original Contract

The Authority acquired an additional 128 MGD of untreated Water Facility Demand Allocation when it negotiated a First Supplement to the Original Contract. The First Supplement provided for the funding and construction of the **Luce Bayou Interbasin**

Transfer Project (LBITP), which will move *untreated* water from the Trinity River into Lake Houston for *treatment* at the CoH water treatment plant. This agreement brought the Authority's Untreated Demand Allocation to 159 MGD but left its Treated Demand allocation at 31 MGD.

The Luce Bayou Project (LBITP)...

As currently conceived, the proposed $350 million LBITP, a 300-foot wide corridor, will begin in central Liberty County at the Trinity River and terminate in northeast Harris County near the confluence of Luce Bayou and Lake Houston. It will ultimately transfer approximately 500 MGD of untreated water through three miles of dual 108-inch underground pipeline mains from the proposed 35-acre Capers Ridge Pump Station on the Trinity River, and then via 23.5 miles of gravity-flow canal to a discharge structure that will outfall into the backwaters of Lake Houston.

Once transferred and treated at the Northeast Water Purification Plant, Luce Bayou water will then be delivered to the City of Houston, NHCRWA, and various other water authorities in the region. When completed, LBITP deliveries will serve as the City of Houston's primary backup untreated water supply, a role currently filled by its two-thirds ownership of Lake Conroe water. In short, hundreds of municipal water districts and millions of residential customers in the northern and western Houston metro area and northern Fort Bend County will reap the benefits of a dependable, long-term supply of treated surface water provided by the LBITP. (Read the April 2014 ***Waterlines*** newsletter article, "*Luce Bayou Interbasin Transfer Project...50 Years of Planning online at* www.nhcrwa.com .)

Luce Bayou Financing...

The $350 million project has received $33 million from the Texas Water Development Board's (TWDB) Water Infrastructure Fund (WIF). The WIF provides funding for geotechnical and environmental studies, surveying and preliminary engineering design. An additional $28.8 million has been approved by TWDB from their State Participation Program (SPP) for additional design, construction and archeological investigations. Acquisition of right of way and mitigation property was funded by $20 million from the City of Houston and participating water authorities. A $300 million Abridged Application to the TWDB for State Water Implementation Fund for Texas (SWIFT) financing has been submitted to complete Luce Bayou. The 3-year construction project's anticipated completion date is July 2019.

Second Supplement to the Original Contract

The Authority recently participated in negotiating a Second Supplement to the Original Contract to facilitate the addition of 320 million gallons per day (MGD**)** of treated water production capacity to the Northeast Water Purification Plant (NEWPP). This will allow NHCRWA to increase its Treated Water Facilities Demand Allocation by 113 MGD to 144 MGD, which should satisfy the Authority's surface water needs until 2040.The expanded capacity (Expansion Project) will consist of adding four (4) water treatment modules to the NEWPP, each capable of producing 80 MGD of treated water.

The Second Supplement Expansion Project

Total cost of the Expansion Project is estimated to be $1.28 Billion.

Phase I: The first module (80 MGD) is projected to cost $266.2 million and become operational no later than August 31, 2021. NHCRWA will control 63.81% of Phase I capacity, or 51.05 MGD at a cost to the Authority of $169.9 million.

Phase II: The remaining three modules (240 MGD) are projected to cost $621.1 million and become operational no later than June 30, 2024. NHCRWA will control 25.81% of Phase II capacity, or 61.95 MGD at a cost to the Authority of $160.3 million.

Multi-Phase Work: Because some portions of the project will benefit both phases, the Authority will fund all "Multi-Phase Work" based on its pro rata share (35.31%) of Treated Water Facilities Demand Allocation. Multi-Phase costs are projected to be $393.1 million. Of that total, the Authority's share will be $138.8 million.

Another important feature of the agreement is that the Authority will be involved in every step of the procurement, design and construction of the Expansion Project. The Second Supplement to the Original Contract also requires detailed formal reporting of financial information to the Authorities so that they can monitor the total expenditures and their own costs related to the Expansion Project (see the Water Contract, Second Supplement, Executive Summary, at *www.nhcrwa.com*).

Partners for the Future...

The West Harris and Central Harris County Regional Water Authorities, the City of Houston, and the North Fort Bend Water Authority are the North Authority's partners in these projects. In addition to the cost of purchasing the surface water from the City of Houston, there are shared transmission, operations and maintenance expenses, and routine water facility expenses – chemicals and energy, for example – to be paid.

All of these factors – coupled with the cost of constructing the 2025 system – will impact the cost of water. **The NHCRWA is not a taxing entity**. Funding for our water supply and the entirely new infrastructure needed to deliver the water to northwest neighborhoods will be accomplished through the sale of Revenue Bonds, paid for by groundwater pumpage fees and the sale of surface water it purchases from the City of Houston.

The Authority is committed to efficient and conservative management of financial resources. Fee increases are imposed only as necessary. Again, 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.

SWIFT Financing Sidebar:

Water project funding options are now available through low-interest loans from the Texas Water Development Board (TWDB) approved during the past two Legislatures and by public vote. These include the **Proposition 2** (a constitutional amendment passed November 8, 2011 that allows for the issuance of additional general obligation bonds by the TWDB in an amount not to exceed **$6 billion** outstanding at any time for water supply, water quality, and flood control projects), and **Proposition 6** (a constitutional amendment passed November 4, 2013), which creates and dedicates two new funds: the State Water Implementation Fund for Texas (SWIFT) and State Water Implementation Revenue Fund for Texas (SWIRFT). **Under Proposition 6, the legislature also authorized a one-time, $2 billion investment** from the Economic Stabilization Fund (also known as the Rainy Day Fund) to be deposited into the SWIFT to support water supply projects in the state water plan.

These funds are designed to make the financing of water projects through bonds more affordable for local entities and ensure that consistent, ongoing state financial assistance is available so that our citizens will have adequate water supplies during drought. Not less than 20 percent of financial assistance will be applied to support projects that are designed for water conservation or reuse. Applicants for assistance must already have implemented effective conservation programs and be committed to extending the life of their current supplies.

Financial assistance from these funds will be used to support the issuance of bonds with bond proceeds loaned to local entities. Simply put, a bond is a loan. It is a contract to repay borrowed money with interest. Local entities request a loan from the TWDB, who, on behalf of the state, then issues bonds and loans the proceeds to the local entity for water-related projects. The local entities repay their loans with interest, and the TWDB then uses those funds to pay the scheduled payments on the TWDB-issued bonds.

PREPARING FOR TOMORROW

"When the Authority was first created in 2000," said Jimmie Schindewolf, P. E., NHCRWA General Manager, "just under 419,000 people called this area home. We used about 70 MGD (25 billion gallons a year) back then. Over the next ten years, however, population growth exceeded projections by 113,000 people – and reached 601,000! In just that one decade," Schindewolf explained, "our annual water consumption increased by 11 billion gallons to 104 MGD (38 billion gallons in 2011). The TWDB's 2012 State Water Plan projects that the population of Texas will increase a staggering 82 percent between now and 2060, growing from 25 to 46 million people. In the 15 county Region H area alone, that number is expected to climb to 8 million."

"Thanks to voluntary water conservation efforts," Schindewolf continued, "we have managed to reduce our per-capita water use over the past decade, which had the effect of leveling out the increase in demand during that period, stretching the supply. It will be absolutely essential to continue our conservation efforts in the years ahead to accommodate the anticipated increase in population."

Now in its 15th year, the Authority continues to fulfill its mission to develop and implement a strategy for complying with the Subsidence District's Regulatory Plan designed to significantly reduce groundwater pumping in order to halt subsidence. The Plan, updated in 2013 to extend the next conversion deadline from 2020 to 2025, requires the Authority to achieve a 60 percent use of surface water by 2025 as compared to the current 30 percent requirement met in 2010. With help from the many MUDs within the Authority's boundaries – and the imposition of pumpage fees that are passed through to all water users – the groundwater reduction goals of the initial 2010 mandate were met.

Meeting the Challenge

Some of the biggest hurdles lie ahead. It will take an estimated $1 billion plus to pay the Authority's share of projects to meet the next (2025) conversion deadline. The additional infrastructure needed to deliver the water to northwest neighborhoods is proceeding as planned. The Luce Bayou Project, to transfer water from the Trinity River to Lake Houston to help meet increasing demand, is now underway. And details of the water treatment plant Expansion Project negotiation (the Authority's share is $469 million) have been completed and approved.

To ensure that financing the Authority's pro rata portion of partner projects and its own infrastructure costs are as affordable as possible, the board is taking a very aggressive approach in submitting requests for TWBD funds created by the passage of Proposition 6 in 2013 – funds designed to help water entities raise money for new projects faster and at lower rates than through

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– Jimmie Schindewolf, P.E.

normal channels. These projects include the $1.28 billion Northeast Water Purification Plant Expansion Project and the $350 million Luce Bayou Interbasin Transfer Project. The low-interest TWBD loan program is designed to be revolving, with the seed money ($2 billion) used time and again as water-entity borrowers repay their debts. (See SWIFT Sidebar on page 3.)

Meet Patty Potty. She's a 1950's housewife… somewhat prissy, often bossy, and completely in charge of her home and family. She is uncomfortable having to talk about toilet topics but overcomes her reluctance because she is on a crusade. Armed with her pink plunger, she is determined to put a halt to stuff being flushed down toilets that ends up costing everyone money.

Patty grew up in an era in which talking about bathroom practices was strictly taboo. Kids, on the other hand, have always loved "potty talk"! Today, TV spokespersons from "bears" to "Brits" are aggressively marketing a variety of bathroom hygeine WIPES. Interestingly enough, the origin of so-called baby wipes likely came in the 50's. After the war, families did more traveling and moms welcomed a compact, disposable product for keeping little ones clean on the go. By the 1990's, there were hundreds of brands – many in convenient pop-up containers – for parent's to choose among.

These days pre-moistened "wipes" are available for virtually every household and personal hygiene purpose. The original moist clean-up product was meant to be folded into the disposable diaper and discarded in the trash. During the last decade; however, marketers have targeted adults to offer products intended to supplement or replace toilet paper. Convenience and "clean" appear to trump all other purchase motivations. We are suckers for products that promise to save time and money, and still get the job done with little or no effort. Unfortunately, when it comes to supposedly "flushable" wipes, many of these man-made fiber products turn out to be nearly indestructible, so they 'flush down, but they don't flush out!"

"People are flushing all kinds of things down the toilet!" Patty points out. "It's not a trash can, you know! Wipes don't decompose. They get tangled up in wastewater treatment plant screens and filters, creating giant WIPES-BERGS that cost hundreds of thousands of dollars each year to clear and repair!"

Toilet paper is supposed to come apart in water. It is fragile by design. A premoistened wipe, on the other hand, is intended to be tough enough to hold up while soaking in its own liquid, and to still be sturdy when used. The wipes are made of very strong fibers and, like a spiderweb, they look deceptively delicate.

"There is nothing wrong with these products," she continued. "I use them myself! The problem is how people dispose of them, so we're asking folks to TRASH 'EM, DON'T FLUSH 'EM!"

Take Patty's Pledge.. Patty's message – NO WIPES IN THE PIPES – may be "staged" in the 1950's, but Patty reminds us that much of the water infrastructure we rely upon today – inlcuding underground pipes, pumping and treatment facilities – was built at the end of WWII. Astronomical population growth and economic development has taken place in Harris and Montgomery counties since the post-war 1950's. More people produce greater demand for water…and protecting and maintaining our aging sewer infrastructure deserves our priority attention and public action.

Please join Patty's "Potty Patrol" and take the NO WIPES PLEDGE to help prevent costly plumber bills and water treatment plant repairs. For more information about how you can help, visit www.PattyPotty.com.

What does an elementary school science lesson have to do with today's global water crisis?

Most of us learned about the **hydrological or water cycle** by the time we were in the fourth grade. It is a pretty important science lesson, but a lot of years might have passed since then, so here's a recap...

The water cycle has no particular starting point, so let's begin with the oceans, since that is where most of Earth's water exists. The sun -- the energy behind the water cycle -- heats up the earth's surface water. Some evaporates or vaporizes into the air. Rising air currents carry the vapor up into the atmosphere, along with water from evapotranspiration, which comes from plants and the soil. The vapor rises into the air where cooler temperatures condense it into clouds. Air currents move clouds around the globe, cloud particles collide, and then fall out of the sky as precipitation -- rain, sleet or snow. Some of the snow can accumulate as ice caps and glaciers, storing frozen water for thousands of years. Most precipitation falls back into the oceans or onto land, where, thanks to gravity, the precipitation flows over the ground as surface runoff. Some of the runoff finds its way to rivers, which ultimately flow to the oceans. Runoff and groundwater seepage accumulate and are stored as freshwater in lakes, rivers and streams. The rest of the runoff soaks or infiltrates into the ground and replenishes aquifers (saturated subsurface rock), which store huge amounts of freshwater for long periods of time. Yet more groundwater is absorbed by plant roots and ends up as evapotranspiration from the leaves. All of this water keeps moving and the cycle continues endlessly.

Now that we're reminded about how the water cycle works, here are some disturbing facts: Less than 1 percent of all the freshwater is readily accessible for human use. In the 20th century, the world's population tripled, but the use of water increased sixfold. By the middle of this century, there will be an additional 3 billion people on our planet. One in five people already do not have access to safe drinking water. Groundwater depletion is a global condition. At least 2 billion people rely on groundwater as their primary water source, and much of this water comes from aquifers that are increasingly at risk in the coming decades. Think of this as a lot of people drinking from straws in the same glass of water...sooner or later the glass will be empty.

Are you getting the picture? Sure, there may be plenty of water on the planet, but it isn't always where people need it most. Isn't it time to stop taking our finite water resources for granted. Will you and your family make a commitment to use water more efficiently?

Water...we can do so much more with less!

HOW MUCH WATER DOES MY TEXAS LAWN NEED?

Great question. Unfortunately, there is no single simple answer! There are many variables -- the season, type of turfgrass, the quality of the soil, recent rainfall, and even the height of the grass itself.

Texas A&M research scientists and turfgrass specialists -- like Dr. Richard White -- have been focusing on these questions as well as issues associated with water conservation, irrigation scheduling, and water quality preservation for decades. Their research is paying off with some solid advice for homeowners about how they can do a better job with water management. One of the most valuable recommendations has to do with the method used to apply the water. If folks would use the *cycle and soak method for irrigating*, they would capture more water in the soil, avoid unnecessary runoff into the gutter or street, and produce better turf and healthier plants in landscaped areas.

According to Dr. White, cycle and soak isn't accomplished by setting the controller to come on all at once for 20 to 30 minutes. Their reserach demonstrates that doing it that way will waste or lose 30 to 40 percent of the water applied. Texas has a variety of soils that range from sandy to clay textures, but most urban lawns are on clay textured soils. They may be fertile, but they have very small pore spaces and are slow to accept water. Technically, that means that infiltration rates are well below one-tenth of an inch per hour.

Setting the controller to turn the sprinklers on for a brief period (5 to 6 minutes) and off for about an hour to allow the water to thoroughly soak into the soil, then have it come on again for another 5 to 6 minutes. White says there might be a small amount of runoff using this method, but nothing like what can occur with the typical 20-minute cycle.

How efficient your watering will be is another factor to avoid wasting water. Here are some suggestions.

Helpful Tips...

- Restrict watering to early morning, before 4:30 a.m. before the household's water rush hour and before the sun can evaporate the sprinklers' distribution.
- Avoid cutting grass too short; longer grass loses water more slowly and helps to keep the soil moist.
- Add mulch to landscaped areas to retain moisture.
- Kill the thirsty weeds that steal precious water from grass roots. Deep roots grow healthier turfgrass.
- Install a rain gauge or "smart" controller on your irrigation system to prevent it from coming on during or after a recent rain.

Visit online (*www.SaveWaterTexas.org*) for more helpful, water-sparing irrigation tips. ■

"A typical landscaped yard consists of lawn area and ornamental plants. If watered properly, homeowners can see the beauty, pocket some green, and save some water..."
– Dr. Richard White,
Texas AgriLife Research turfgrass management scientist, College Station, TX

Source: Based in part on an AgriLife TODAY article, "Water, rest, water, save" by Kay Ledbetter.

North Harris County
REGIONAL WATER
Authority

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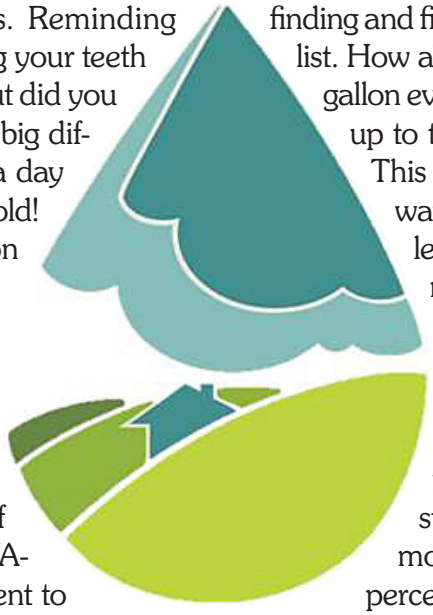
Are you doing everything you can to use water wisely at your house?

No one deliberately sets out to waste water. Everyone knows it is our most important finite natural resource. Sometimes it is done carelessly; sometimes out of habit. But every time water is wasted it impacts us all.

The problem is that with exponential world wide population growth and the demand for water skyrocketing, we can't afford to waste a single drop. Fortunately, using water efficiently requires little to no personal sacrifice...just some common sense behavorial modifications. Reminding yourself to turn off the water while brushing your teeth and back on to rinse isn't rocket science. But did you know that such a small action can make a big difference? This can save 8 gallons of water a day times the number of people in the household! Or looking at it in a positive light, one person turning off the water can save 200 gallons of water a month. That wasn't hard!



So, how do you and your family make water conservation a part of your daily lives? Here's a start: before turning on the faucet, the shower or tub, the sprinklers, or turning on the dishwasher...ask yourself a simple question...IS IT WORTH THE WATER? Once you have made the commitment to use water wisely, where do you start? Are there some actions that are more water-sparing than others? How can you tell if the strategy is working?

To know if you are succeeding, you have to first know how much water your household is using, and the quickest way to do this is to study several months of water bills. Since the statements will not tell you exactly WHAT used the water, you'll have to do a basic water audit. How many members in the household? How many showers/baths are taken daily? How many times a week/month do you run the dishwasher or washing machine? Do you run them only with full loads? And the really big question...do you have an irrigation system? When was the last time you changed the settings on the system's controller? How often do the sprinklers run, and for how long? How often do you check all the faucets (outside, too), tubs and showers for leaks? Studies have shown that more than 10 percent of the water used in the home can be attributed to leaks, so finding and fixing them should rank high on your "to do" list. How about those silent toilet leaks? A leak of one gallon every six minutes is not unusual...and can add up to ten gallons an hour, or 240 gallons a day. This can actually DOUBLE the total monthly water usage by the entire household! These leaks are usually not difficult to repair, but most certainly should not be ignored once discovered!

By far, the largest water user at your home – and therefore the greatest potential water saver – is your irrigation system. A recent Texas Water Development Board study that analyzed metered water use in more than 250 Texas cities found that 31 percent of annual single-family residential water use in the state takes place outdoors.

According to Texas A&M AgriLife researchers, *urban irrigation ranks as the state's third largest water user*, and further it can reasonably be assumed that one half of this water is unnecessary. Armed with this information, you may want to start your water conservation strategies by adjusting your system controller and adding a rain sensor or smart controller to keep the system from coming on in the rain.

For some great water efficiency tips, visit *www.SaveWaterTexas.org* and start saving!