

WATERWORKS

Water is a valuable natural resource...please use it wisely.

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Water Authority Makes Historic Delivery of Surface Water

The first surface water ever delivered in northwest Harris County is now flowing to utility districts within the boundaries of the West Harris County Regional Water Authority. This water is being delivered consistent with our initial schedule and within our budget constraints.

Harris County MUD 179 became the first utility district to receive the surface water in mid-September. At the outset, the district will receive approximately 250,000 gallons a day.

The surface water being supplied ahead of the 2010 timeline is provided by the City of Houston from its Jersey Village pump station. While this delivery is significantly ahead of the first mandated conversion milestone, it has been accomplished to assist districts with water quantity or quality issues and to provide the Authority with early conversion credits under its Groundwater Reduction Plan with the Subsidence District. The miles of waterline installed for this inaugural water delivery were constructed with today's dollars and funded by bond issues with very favorable interest rates. The lines have been constructed with a minimum of inconvenience to local residents and commerce, and the projects are being completed within contractual guidelines. This new infrastruc-



At a symbolic turning of the valve, left to right: Chris Hoffman, H2O Consulting, Inc.; Srikanth Pudukula, Turner Collie & Braden, Design Manager; Wayne Ahrens, Dannenbaum Engineering Corp., Program Manager; Brent Broadway, HCMUD 179; Mark Fenlon, Assistant Construction Manager; Chuck Hadley, president, HCMUD 179; Wes Robertson, HCMUD 179; Dan Sallee, WHCRWA President; and Troy Anthony, Construction Manager.

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Surface Water...

Continued from page 1

ture now becomes the foundation for the initial phase of the overall surface water delivery system needed for compliance with the 2010 conversion requirements.

Historical Perspective...

The WHCRWA has been in existence just a little over four years, and the Board takes considerable pride in being able to announce such momentous accomplishments in that limited time period. The Authority has designed, published for bid, purchased easements and rights of way, and constructed over 12.5 miles of new waterlines that will deliver up to 2.5 million gallons of surface water a day to 10 utility districts within approximately 60 days. (These 10 districts are: HCMUD Nos. 130, 155, 162, 163, 179, 186 188, 208; Horsepen Bayou MUD and Spencer Road PUD. In addition, HCMUD 255 receives water from Horsepen Bayou MUD and HCMUD 156 receives water from HCMUD 155.)

We have an aggressive Capital Improvement Plan in place, and we are meeting the



timelines that have been established for design and construction of the Authority's facilities.

Here's a thumbnail look at the Authority's construction projects and Capital Improvement Plan through 2010.

- Initial 6 contracts -- totaling \$22.7 million -- near completion;
- April 2005 Bond Issue, \$72 million for projects through 2007;
- Awarded 5 additional design contracts;
- Phase I through 2010, 21 construction projects totaling \$137.5 million; and,
- Design and construct the Authority Pump Station. ♦



Pumpage Fee to Increase

The WHCRWA Board of Directors, at their October 2005 meeting, voted unanimously to increase the Authority's pumpage fee, effective January 1, 2006. The Groundwater Reduction Plan (GRP) pumpage fee will increase from \$0.50/1,000 gallons to \$0.65/1,000 gallons pumped; and the surface water delivery fee will increase from \$0.80/1,000 gallons to \$0.95/1,000 gallons received.

This decision is consistent with the Board's commitment to provide equitable pricing throughout the Authority; to meet the mandatory surface water conversion deadlines in the GRP; to meet its operational expenses and to satisfy the covenants relating to the Authority's bonds and other obligations; and to generate adequate funding for current and future capital improvement projects approved by the Board.

The rate increase was based on a thorough analysis completed by Economists.com – and is also consistent with views expressed by utility district representatives during Town Hall meetings over the past year. In the future, these fees are likely to be adjusted annually to meet increases in operating expenses as well as in construction costs and debt service. (See page 8 to see an example of how this increase might cost you.) ♦

Why Should I Care About Subsidence?

There are plenty of reasons...not the least of which are preserving our land for future generations and, “cha-ching” -- saving money. We all know that it’s important to conserve our natural resources, but are we really doing anything in our own homes to make it happen? And how does that apply to subsidence?

The truth is, it can be difficult to change our habits when we aren’t sure how our actions could make a difference. To truly get motivated, we must first understand the fundamental issues and why change is necessary.

Water in Our Area

The utility districts that supply our neighborhoods with drinking water have traditionally drawn groundwater from aquifers beneath the earth’s surface. But our area’s steadily increasing population and decades of aggressive water usage have resulted in a decline of the aquifers and subsidence (the actual “dropping” or “sinking” of land). In fact, some areas in northwest Harris County have dropped as much as 5 feet (Jersey Village area) over the last 25 years.

How do we really know there are changes in land elevation?

The Harris-Galveston Subsidence District (HGSD) has been measuring subsidence since the mid-1970s, and they are the first U.S. regulatory agency of their kind with the assignment to “end subsidence”. Their current measurement methods combine the latest technology (which collects data from orbiting satellites), with knowledge gained from more traditional methods, resulting in highly accurate measurements of change in land elevation due to

subsidence. Armed with the authority to restrict groundwater withdrawals, the HGSD has positively impacted critical situations in the coastal and Galveston Bay areas...and are now focusing much of their efforts in our area. As a result, our area is in the process of converting from ground to surface water and will be only 20 percent dependent on groundwater by 2030.

Global Positioning Satellite

The HGSD has been working with Global Positioning Satellite (GPS) technology since 1987, providing reference frames to measure subsidence at specific locations throughout the area.

These permanent stations are known as local GPS Continuously Operating Reference Stations, or CORS. In the mid-1990s, the District and the National Geodetic Survey also began utilizing portable units, or PAMS (GPS **P**ort-**A**-Measure) to provide subsidence measurements.

Seven portable trailers were built to house and secure GPS receivers and associated equipment (batteries, recording equipment and solar panels). The trailers are moved weekly to different PAM stations where they record data every 30 seconds, providing a

week’s worth of observations on each PAM, every month.

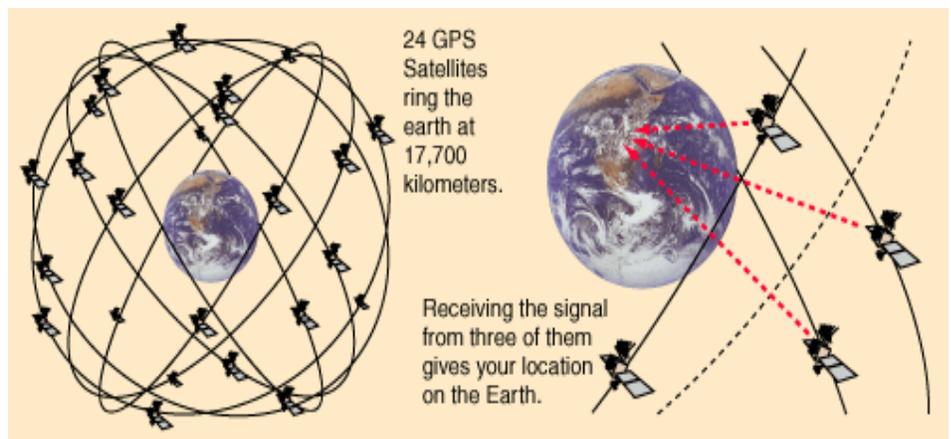
The District also operates four permanent CORS, which continuously output data, providing a basis from which change comparisons may be made and analyzed. Historical comparisons between the existing CORS and PAMs have indicated that some sites are subsiding at rates of seven centimeters per year -- that’s almost three inches!

In the very near future, the District plans to double the number of PAMs, from 28 to 56. This expansion will be accomplished without an increase in personnel, equipment or overhead costs. Improvements in GPS equipment have recently eliminated the need for the seven trailers, and they will be phased out.

Information for the Future...

The expansion of the monitoring network will not only permit a more comprehensive view of what is occurring in Houston and the surrounding areas, but will also serve as a future model for other localities facing similar problems.

It is through this continued monitoring of subsidence and a commitment to water conservation that we will assist in the process of replenishing our aquifers. 💧





What do an alligator, a frog and a salamander have to do with water conservation? “Nothing” would be an easy answer...but it would reveal that the responder hadn’t read the delightful new adventure story, **Journey to Pansophigus** that features just those three water dwellers as the main cast of characters.

The children’s book was written by gifted local writer, Nikki Wynn. She dreamed up a story that coincided with the Authority’s water conservation education goals, and effortlessly incorporated a complex global issue into her adventurous and captivating storyline.

Journey has all the right ingredients for a hit book -- it includes a band of likable characters, the age old conflict between “good guys” and “bad guys”, some nail-biting moments, the emergence of reluctant heroes, and a strong, clear message.

“The process of writing *Journey to Pansophigus* was a real journey for me, too” said Wynn. “The first challenge was to determine what grabs the interest of children in this late elementary / early junior high age group and to merge it with a crucial conservation message -- without making it too obvious. This story would have no impact if it didn’t first entertain.”

Join Us For an Exciting Water Conservation JOURNEY...

Wynn’s well-developed main characters – Abbie, a lovely teenage salamander; Alex, an alligator who is Abbie’s best friend; and Bub, the exuberant (and often annoying) younger frog, join forces with Pteron, a wimpy dragonfly, and Bradley, a stubborn beaver -- to solve a critical water emergency in Gaea, the tropical lagoon they call home.

To visually bring the characters to life, local artist Daniel Shaw was brought in to contribute his wonderful illustrations. Shaw, a graduate of Eisenhower High School, honed his considerable skills and talent in the Advanced Visual Arts Program at Aldine’s Contemporary Education Center (ACE). His important artistic “inner-eye” gives him the unique ability to transform rough concepts into detailed, artful illustrations.

By all accounts, Shaw’s contribution to *Journey to Pansophigus* is immeasurable. The detail in the illustrations is “awesome” -- to quote one young reader -- and reveals many details about

the characters too complex to put in the narrative. This is the artist’s first book illustration assignment.

The Rest of the Story...

There is much more to the conservation education program than just this delightful book. The effort got a huge jump start when Severn Trent Services donated a 16-foot trailer and generously outfitted it with air conditioning and installed track lighting. The interior was finished with material suitable for the application of graphics and exhibits.

This outstanding gift helped launch the unique **Mobile Teaching Lab** -- an age-appropriate, hands-on approach to water education that will be available to schools, local civic and neighborhood organizations, as well as to the local utility districts for special events.



Exhibits include information on where our water comes from, pollution sources, the water cycle and much more – all developed to be both educational and entertaining.

The WHCRWA has joined forces with the North Harris County Regional Water Authority in sponsoring this program. The goal from the outset has been to develop interesting, informative and user-friendly teaching materials, hands-on experiments and a flexibility to make the program work in a variety of classroom or neighborhood settings. *Journey* ties it all together and delivers the key message: *Water is a precious natural resource that we must protect and use wisely.*

The Story Continues...

While the trailer was being outfitted with custom-made displays, educators were consulted to consider appropriate classroom preparation for on-campus Mobile Teaching Lab visits. This yielded hands-on experiments, which included teacher and student activity guide sheets.

Additional local talent was recruited to develop a fresh design for another key component of the program – an animated hydrologic cycle. The basic concept of the “water cycle” has been communicated to children in many different ways over the years, but this particular rendition is particularly unique and effective.

Talented young designer, Steve Lee, owner of Houston-based Slant Alliance, was asked to collaborate with Wynn to come up with a new, interactive and visual interpretation which allows students to “enter” the cycle at any point in its process. The result? An animated Water Cycle Experience CD that exceeded all expectations.

A Vision Becomes Reality...

With all the components in place, the program is set to “hit the road” this fall. Following a meeting with Superintendents and Science Department heads (from ISDs within the Authority’s boundaries), the Mobile Teaching Lab will begin traveling to schools throughout the system.

“This program is the culmination of almost a year of research, design and creation,” said Dan Sallee, WHCRWA’s board president. “We are especially excited about this opportunity to team up with the North Harris County Regional Water Authority, individual MUDs within our boundaries, engineers, operators and others interested in sponsoring the program, to reach our goal of bringing these materials to as many classrooms and youngsters as possible.”

“Learning to use our finite water resources more responsibly is an absolute necessity. Our community continues to grow,” Sallee commented, “so this is something that needs to take place at all levels of our population. Getting our young people involved in this challenge and committed to the principles of conservation will have a major impact on water use habits and patterns for the future. *Journey* really reinforces the message that becoming good water stewards is a role that will serve them well as they take the reigns of society in the years ahead.” ■



Dan Sallee, WHCRWA president, visits the Mobile Teaching Lab outfitted for visits to school campuses in seven Independent School Districts.

More Information

Want to sponsor some classroom packets for public, private or home schooled students? Visit www.whcrwa.com to learn how to help bring this strong conservation message to local youngsters.

Home Schooling Parents... Single copies, along with a Readers' Guide and the Interactive Water Cycle CD, may be requested through the Authority's website (www.whcrwa.com) while “sponsored” supplies last, or the set may be purchased for a nominal charge through www.waterlilypress.com.

Single copies of *Journey to Pansophigus* may be ordered through www.waterlilypress.com.

Do you have a sprinkler system? Do you know how much water it uses?

While every sprinkler system is different, here are some water usage estimates that should really grab your attention! On average, each sprinkler zone uses approximately 15 gallons of water **per minute**. The tables below show just how much water a sprinkler system *could* use in one month. **These usage estimates are ONLY for the sprinkler system and do NOT include water used elsewhere in the household.**

TABLE 1 -- 15 MINUTES PER CYCLE			
ZONE	Time (minutes)	X15 (gallons)	GALLONS
1	15	X15	225
2	15	X15	225
3	15	X15	225
4	15	X15	225
5	15	X15	225
Totals per cycle	75	X15	1125

**If the system is used every other day, the monthly usage for the sprinkler system alone is calculated:
1125 gallons per cycle times 15 days = 16,875 gallons**

TABLE 2 -- 10 MINUTES PER CYCLE			
ZONE	TIME (minutes)	X15	GALLONS
1	10	X15	150
2	10	X15	150
3	10	X15	150
4	10	X15	150
5	10	X15	150
Total	50	X15	750

**If the system is used every other day, the monthly water usage for the sprinkler system alone is calculated:
750 gallons per cycle times 15 days = 11,250 gallons.**

To figure out how sprinkler use might be impacting YOUR water costs, check the water and sewer rates on your latest statement, and substitute those for the examples used in the table below. Assuming a household water usage of 5,000 gallons, here's what the difference might be in water bills between sprinkler use shown in Tables 1 and 2...

You do the math.

	Household (gallons)	Sprinkler (gallons)	Total (gallons)	Water Cost*	Sewer Cost*	Total Cost
TABLE 1	5,000	16,875	21,875	\$61.12	\$15.00	\$76.12
TABLE 2	5,000	11,250	16,250	\$44.25	\$15.00	\$59.25
Difference						\$16.87

*** For example only**



Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes.

The pollutants include:

- ◆ Sediment;
- ◆ Oil, grease, and toxic chemicals from motor vehicles;
- ◆ Pesticides and nutrients from lawns and gardens;
- ◆ Viruses, bacteria, and nutrients from pet waste and failing septic systems;
- ◆ Heavy metals from roof shingles, motor vehicles, and other sources;
- ◆ Thermal pollution from dark impervious surfaces such as streets and rooftops.

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.

What do YOU know about Stormwater Runoff Pollution?



Stormwater runoff occurs when precipitation flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

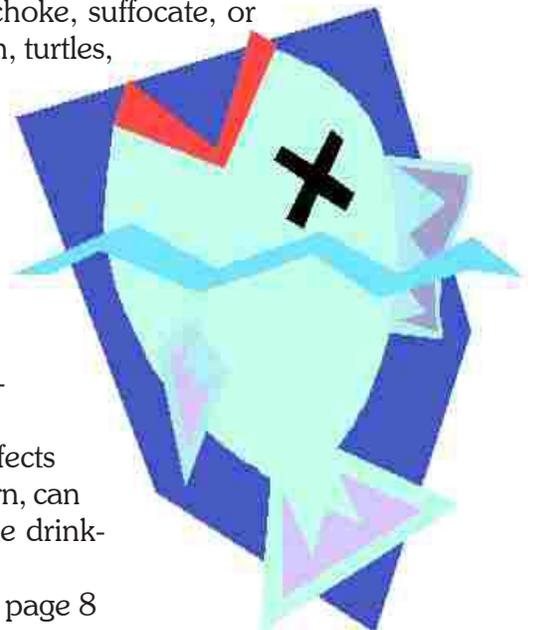
In urban areas, much of the land surface is covered by buildings and pavement, which does not allow rain to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizer directly to streams and rivers, where they seriously harm water quality. Consequently, a typical city block generates more than 5 times more runoff than a woodland area of the same size.

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts - washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life.

Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.

- ◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Continued on page 8

10 Things You Can Do to Prevent Stormwater Runoff Pollution

1. Use fertilizers sparingly and sweep up driveways, sidewalks, and roads.
2. Never dump anything down storm drains.
3. Vegetate bare spots in your yard.
4. Compost your yard waste.
5. Avoid pesticides; learn about Integrated Pest Management (IPM).
6. Direct downspouts away from paved surfaces.
7. Take your car to the car wash instead of washing it in the driveway.
8. Check car for leaks, and recycle



motor oil.

9. Pick up after your pet.
10. If you have a septic tank, have it pumped and the system inspected regularly. ♠

How will the pumpage fee increase impact YOUR water bill?

A WHCRWA pumpage fee likely appears on your water bill from your utility district. This revenue provides funding for the new waterline construction and the conversion to surface water mandated by the Subsidence District. This fee is in addition to the costs for water and sewer.

**If you use
10,000 gal/mo.
(Groundwater)
Old rate**
\$0.50/1,000 gal.
\$5.00 WHCRWA fee

NEW rate
\$0.65/1,000 gal.
\$6.50 WHCRWA fee,
a \$1.50 increase per
billing cycle.

**If you use
15,000 gal/mo.
(Groundwater)
Old rate**
\$0.50/1,000 gal.
\$7.50 WHCRWA fee

NEW rate
\$0.65/1,000 gal.
\$9.75 WHCRWA fee,
a \$2.25 increase per
billing cycle.

**If you use
20,000 gal/mo.
(Groundwater)
Old rate**
\$0.50/1000 gal.
\$10.00

NEW rate
\$0.65/1000 gal.
\$13.00 WHCRWA fee,
a \$3.00 increase per
billing cycle.

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**Please Use Water
Wisely...**

**The water we conserve
today, can serve us
tomorrow.**



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