THE WATER LEVEL

A Water Conservation Publication of the Edwards Underground Water District

MARCH & APRIL 1988 VOLUME 5 EDITION 2

AQUIFER STATUS

In 1987, water elevations and storage in the Edwards Aquifer set record high levels based on over 50 years of data collection. The water elevation at the Edwards Aquifer index well located at Fort Sam Houston reached a record high 699.23 feet above mean sea level. Throughout the Edwards Aquifer region, high water elevations caused wells and springs to flow that usually did not flow. In many locations forgotten or unknown wells and springs began to flow, some creating problems for landowners.

Water elevations in the Edwards Aquifer reached record high elevations because the entire region including the drainage area had received above average rainfall for nearly two years. The above average rainfall brought about high rates of recharge and decreased water demand. This meant that more water was entering the Edwards Aquifer than was being used. When this happens water elevations in the Aquifer rise, much the same way a reservoir would rise when more water is filling it than is being drained.

Since the record high in June, the water elevation at the Edwards Aquifer index well has remained at a high elevation. However, since June the region has experienced 7 out of 9 months with **less than average rainfall.** In February, water elevations at the Uvalde index well fell 2 feet, Hondo index well fell 9 feet, San Antonio index well fell 3 feet, New Braunfels index well held constant, and San Marcos index well fell 2 feet. What is significant about these decreases is that February is typically the month of lowest water demand and yearly high water elevations.

Residents of the Edwards Aquifer region can always remember that the same skies which bring torrential rains will also bring lengthy dry periods, that will undoubtedly parch the area. Adding to this is a growing population and water demand, which could cause the water elevations in the aquifer to decline at a faster rate if below average rainfall continues.

Throughout the year, the Edwards Underground Water District encourages all water users to use water wisely. Water conservation can be viewed by all water users as efficient and effective use of water. Water conservation can be practiced in both rural and urban areas and is the most essential component of good water management policy. Part two of the WATER LEVEL Water Awareness Information Series "Auditing Your Home Water Use" is included in this issue. We hope that you take the time to discover how much water you use and the opportunities you have to conserve water.

TEXAS WATER COMMISSION BEGINS WATER WELL REGISTRATION

The Texas Water Commission is initiating a water well registration program in cooperation with the Edwards Underground Water District. This registration program is required by House Bill 1942, passed by the 70th Legislature.

House Bill 1942 amends the Edwards Underground Water District's enabling Act to provide for drought management. Features of the legislation authorize the District to develop, implement and enforce a drought management plan in consultation with cities, counties and river authorities; directs the Texas Water Commission to initiate water well registration; requires the definition of the stages of drought and development of requirements for reduction of water use at each stage; provision for withdrawal of a county from the District via referendum and voter approval; and increases the Bexar county delegation to six directors, to be elected one each form the county commissioners' precincts and two at large.

Water Well registration forms were recently mailed to well owners within the District in Uvalde, Medina, Bexar, Comal and Hays Counties. Well owners are asked to identify well ownership and well location; provide basic information on well depth, diameter and construction; and provide information on the amount and type of water use.

The Texas Water Commission requests that well owners assist them in carrying out the program by providing this information. A registration form should be filled out legibly and completely for each well. The well owner or agent should sign the form and return it to the District at P.O. Box 15830, San Antonio, Texas 78212.

If you own a water well and did not receive a form or need additional forms please contact the Edwards Underground Water District at 512-222-2204 or 1-800-292-1047; or the Texas Water Commission at (512) 463-8273. Registration forms are also available from the City Clerk's office in Uvalde, Sabinal, Hondo, Castroville, San Antonio, New Braunfels, San Marcos, Kyle and from your local County Extension Agent.

WATER AWARENESS INFORMATION SERIES
NUMBER TWO

AUDITING YOUR HOME WATER USE

For about eleven cents a day, most people have enough water to wash with, to clean with, to cook with, to drink and to water lawns. It is easy to take water for granted when it is so available and so cheap, but this may not always be the case. More people, increasing demand, less rainfall — all of these factors can decrease water availability and increase its cost.

This survey was designed to increase your awareness of the way you use water, and to reveal where wasteful use can be eliminated. As you complete the survey, think about ways water can be used more wisely in your home.

Encourage other family members and friends to also complete the survey and compare results.

SHOWER

A. Average length of shower. _____

B. Flow rate of shower. _____

To measure flow rate:

STEP 1 — Adjust the shower's water flow as you normally would.

STEP 2 — With a one gallon jug, measure the flow for fifteen seconds.

STEP 3 — To find the number of GALLONS per MINUTE, each QUART measured will represent one GALLON.

(Example: If the jug is full after fifteen seconds, you have measured 4 quarts. If each quart represents a flow rate of 1 gallon per minute, then 4 quarts will be equal to 4 gallons per minute.)

If the jug fills before the fifteen seconds are up, empty the jug and remeasure the flow rate using a five second interval. Multiply the measured amount by 3 to get the 15 second flow rate. At the fifteen second flow rate, each quart is equal to one gallon per minute.

STEP 4 — Round off the flow rate to the nearest whole number, and fill in space "B" above.

C. To find the number of gallons used during an average shower in your home, multiply shower time by the flow rate: "A" x "B". _____

D. Are you using a low flow showerhead? _____

(Non conserving showerheads have flow rates of 5 to 7 gallons per minute or more. Low flow showerheads or showerheads with flow restrictors have flow rates of 3 gallons per minute or less)

A national study on residential water use by the United States Department of Housing and Urban Development found that personal bathing accounts for 21 percent of each persons bathing accounts for 21 percent of each person's daily water use. Translating this to local water use data, urban South Texans use approximately 22 gallons per person per day. Compare your shower use to the 22 gallons per person per day; can reductions be made? Can a low flow showerhead or flow restrictor be installed? Can you make changes in your showering habits?

BATHTUB

A. Amount of water used (use table below)

1/3 of tub = 15 gallons
1/2 of tub = 20 gallons
2/3 of tub = 30 gallons

Compare your shower figures with bath figures. According to your data, which uses more water — a shower or a bath? _____

What changes could be made to reduce the water used for bathing?

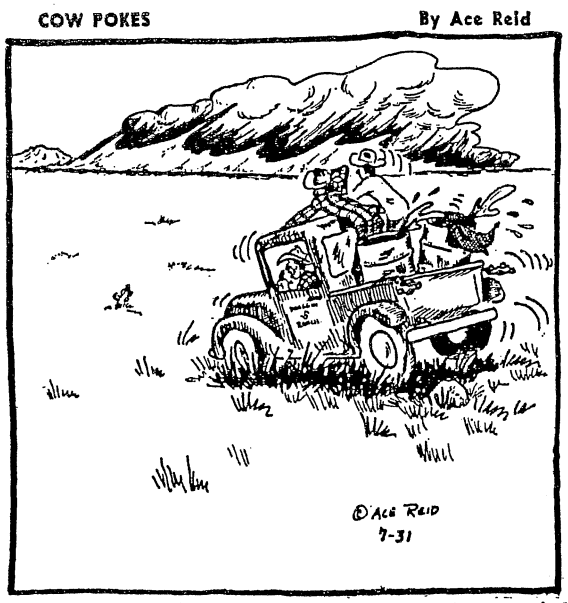
TOILET

A. How many gallons per flush does the toilet(s) in your residence use? _____

(Homes built before 1980 use approximately 6.5 gallons per flush, if fixture has been replaced since 1980, use 3.5 gallons per flush. Most homes built after 1980, use 3.5 gallons per flush.)

B. For toilets using 6.5 gallons per flush check for displacement devices, such as plastic bottles, plastic bags, water dams, or other devices. If a brick is being used, remove it. Bricks may disintergrate or shift the water flow, causing damage to the tank. Toilets using 3.5 gallons per flush are water conserving in design and will not function properly with displacement devices.

If a displacement devices is being used enter the amount of water being displaced, round off to the nearest quart. _____



"Fer years, I hired rainmakers to git some grass, now I'm gonna hafta git a fire department to keep it!"

C. To find the number of gallons per flush used subtract the amount of water being displaced from part A. _____

D. Test for hidden leaks. Place a dye tablet or a few drops of food coloring in the toilet tank, *not the bowl.* Allow the color to settle for ten to fifteen minutes. If coloring appears in the bowl, there is a hidden leak. Check the seal in the flush valve for poor alignment, and for cracks and replace if necessary.

Toilets account for a large portion of indoor household water use: approximately 28%. Can you reduce this by retrofitting with displacement devices, replacing with low flow toilets, or fixing leaky flush valves.

CLOTHES WASHERS

A. How many loads of washing are done each week?

_____

B. Are any of these partial loads? _____

C. Does your washing machine have water level settings for partial loads? _____

D. A survey of 19 major washing machine manufacturers has revealed that normal wash cycles use about 44 gallons per load. Permanent press cycles use more water because of extra rinse and cool down cycles. Permanent press settings require about 55 gallons. How many loads do you wash at each setting?

NORMAL:_____ PERMANENT PRESS:_____

Can you reorganize your laundry routine to use water more efficiently.

DISHWASHERS

A. Number of loads per week? _____

B. Number of partial loads? _____

Most dishwashers need 13 to 16 gallons to complete a full cycle. Can you apply some of your discoveries made in clothes washing, to dishwashing?

FAUCET

A. Faucet flow rates range between two and six gallons per minute. Use the procedure described in the "SHOWER" section to measure faucet flow rates in gallons per minute.

Use your faucet flow rate to estimate your daily water consumption for each of the following:

Teethbrushing: _____

Shaving: _____

Drinking: _____

Garbage Disposal: _____

Washing fruits and vegetables: _____

Cooking and food preparation: _____

B. Do any faucets drip? A small drip can cost you thousands of gallons per month and if it is on the hot water side it is also costing you the energy to heat it. _____

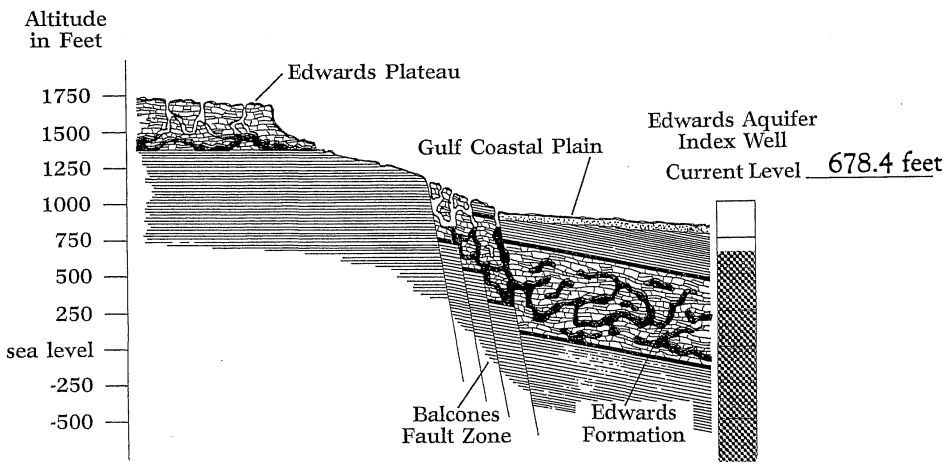
A drip of one drop per second can waste a gallon of water per day.

A steady slow drip can waste 170 gallons per day or 62,000 gallons per year. Note this is more than the average yearly indoor water use for a person.

FREE WATER CONSERVATION KITS

The Edwards Underground Water District distributes water conservation kits to residents which live within the District. These kits consist of two shower flow restrictors, a one gallon toilet tank displacement bag, non toxic blue dye tablets that detect silent toilet tank leaks, and informational brochures about conserving water.

By installing one of these kits, you can reduce your water use approximately 8%. GET YOUR FREE KIT TODAY BY CONTACTING THE DISTRICT IN WRITING OR BY PHONE.



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WATER MEASUREMENTS

Water volumes measured in a variety of confusing units. The following are definitions of some of the English units used to measure water volumes:

GALLONS: (abbreviation: gal) a measure of volume equal to 231 cubic inches weighing 8.3 pounds. One gallon equals .133 cubic feet. Commonly used to report residential municipal water use.

CUBIC FEET: (abbreviation: ft^3) a measure of volume equal to 7.48 gallons weighing 62 pounds. Commonly used to report residential municipal water use.

BARREL: (abbreviation: bbl) 55 gallons; however when used to measure beer = 31 gallons; wine = 31.5 gallons; oil = 42 gallons; and whiskey = 45 gallons.

ACRE FEET: (abbreviation: acre-ft) the quantity of water that would cover 1 acre to a depth of 1 foot. Equal to 325,851 gallons or 43,560 cubic feet. Commonly used toreport annual recharge and discharge to the Edwards Aquifer and storage in surface water reservoirs.

GALLONS PER MINUTE: (abbreviation: gpm) a measurement of a moving volume of water. One gallon per minute is equal to 1440 gallons per day, and 191 cubic feet per day. Commonly used to report water well discharge or water demand.

CUBIC FEET PER SECOND: (abbreviation: cfs) a measurement of a moving volume of water. One cubic foot per second equals 448.8 gallons per minute, and 1.98 acre-feet per day. Commonly used to report stream and river flows.

GALLONS PER CAPITA PER DAY: (abbreviation gcpd) a measurement used to describe average daily water use by each person. It is commonly used by policy makers and water resource planners to analyze the water needs and potential savings of conservation programs.

EXHIBIT PLANNED AT VIVA BOTANICA APRIL 9 & 10, 1988

The Edwards Underground Water District will have on display the exhibit "The Aquifer That Shaped South Texas" at San Antonio Botanical Center's annual open house event Viva Botanica April 9 and 10, 1988. Free wildflower seeds, Xeriscape and other conservation materials will be distributed at the exhibit.

If you plan to attend Viva Botanica don't forget to visit the South Central Texas Xeriscape. Demonstration garden is located at the San Antonio Botanical Center. The demonstration garden is a thriving example of what Xeriscaping is — WATER CONSERVATION THROUGH CREATIVE LANDSCAPING.

The San Antonio, Botantical Center is located at 555 Funston Place in San Antonio. There is a small admission charge to Viva Botanica.

EDWARDS AQUIFER INDEX WELL

On March 23, 1988 the water elevation at the Edwards Aquifer, Bexar County index well (AY-68-37-203) was recorded at 678.4 feet above mean sea level (AMSL). The water elevation has decreased 6 feet since January 1, 1988. The March historical average water elevation 1932-1988) for the Bexar county index well is 668.0 feet AMSL.

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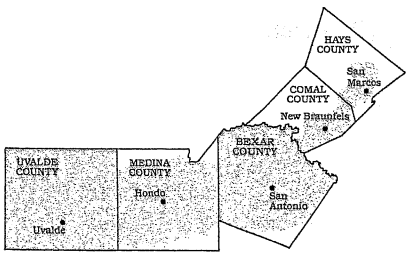

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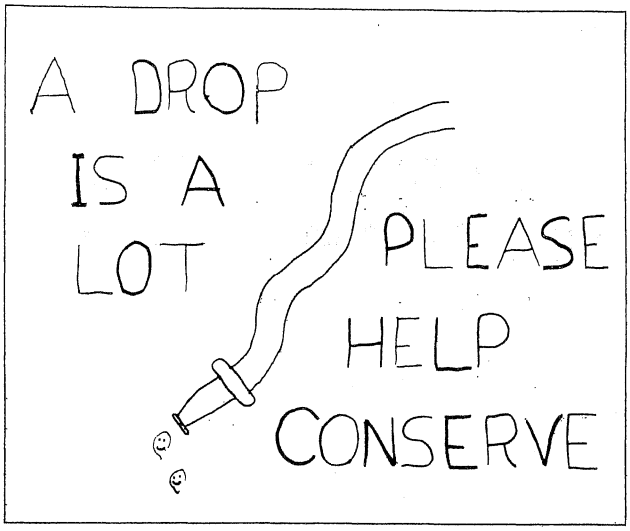
MAY & JUNE 1988

VOLUME 5 EDITION 3

WATER AWARENESS MONTH
May 1988



Kevin Fagg
2nd Grade, Northwest Crossing Elementary School
Northside Independent School District

Edwards Underground Water District

"Conserve Water — Protect the Edwards Aquifer"

WATER AWARENESS MONTH

On May 10, 1988 the Edwards Underground Water District will once again designate May as "Water Awareness Month." This designation is in keeping with the District's concerns for the conservation and preservation of the Edwards Aquifer.

The Edwards Aquifer is not a limitless source of water. It is affected by rainfall and the demands we place upon it. It is every person's responsibility to use water prudently so we continue to have an adequate supply now and in the future.

As part of the Districts water awareness activities, the District has sponsored a poster contest for elementary school children throughout the five county area of the District. Kevin Fagg, a second grader from Northwest Crossing Elementary School in the Northside Independent School District in San Antonio has been selected for the grand Prize award. Kevin's winning poster entry has been reproduced as the official Water Awareness Month Poster and is being distributed throughout the District. Awards of Merit were given to all students who participated in the contest.

EDWARDS AQUIFER EXHIBIT AT SAN ANTONIO ZOO

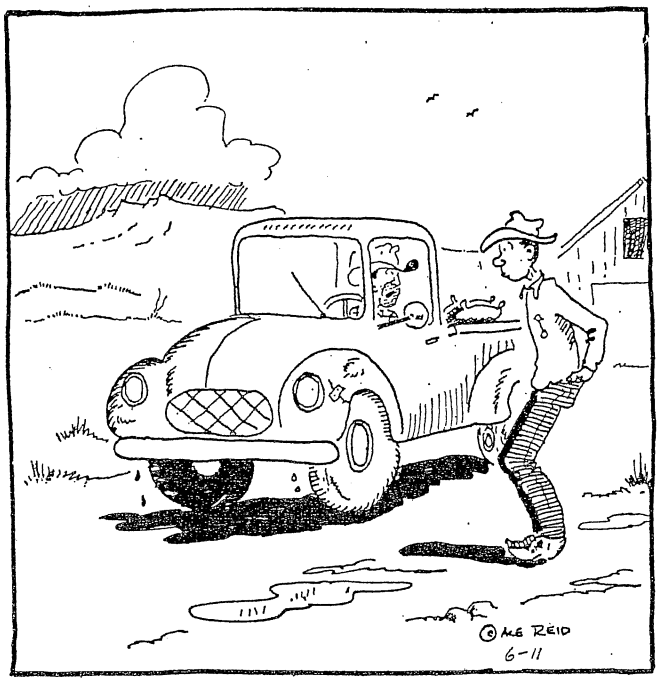
The Edwards Underground Water District has funded a permanent exhibit at the San Antonio Zoo. The theme of the exhibit is: The Edwards Aquifer is a unique and valuable resource for many forms of life, including the people of the region, and people are responsible for preserving it. The exhibit is located on a 13-foot wall facing the entrance of the Friedrich Aquarium.

The new exhibit will be an opportunity to showcase some of the unique habitats and animals that are dependent upon the Edwards Aquifer. The exhibit also relates the importance of the Edwards Aquifer by tracing the journey of a raindrop from the Hill Country, into the honeycombed and cavernous limestone of the Edwards Aquifer, bubbling out clear springs and flowing down the rivers to the Gulf of Mexico.

As part of the exhibit the zoo's education department is introducing a special unit on the Edwards's Aquifer which will become a permanent part of its education program.

The San Antonio Zoo is located at 3903 N. St. Mary's Street (in Brackenridge Park) in San Antonio.

COW POKES **By Ace Reid**



"Wul, what did you think about that rain—it quit comin' down before I could git my winders rolled up!"

DROUGHT MANAGEMENT PLAN MEETINGS SCHEDULED FOR PUBLIC COMMENT

A draft Drought Management Plan was approved by the Edwards Underground Water District in March of 1988. A series of public meetings for comment on the draft plan have been scheduled throughout the District beginning in mid-May, 1988. For the location and time of the meeting nearest to you, please contact the District at (512) 222-2204 or 1 (800) 292-1047.

The District's draft Drought Management Plan incorporates a series of actions to be taken by persons in the region to alleviate the impacts of water shortages during periods of droughts. It builds upon the activities of the long-term conservation program initiated by the District in 1980 focusing on public education and awareness, and upon a water management plan. A Drought Management Plan is not a conservation plan, it is a special plan for specific times of need.

Limited copies of the draft Drought Management Plan are available by contacting the District.

WATERING YOUR SOUTH TEXAS LAWN

Lawn watering accounts for approximately 35-40% of residential water use. Knowing how much to water and when to apply this water is important to maintain an attractive lawn and conserve water.

An efficient watering program must include three basic steps:

1) Determining when to water,

2) Determining how much water should be applied, and

3) Deciding how water is to be applied.

Determining When to Water

The most efficient way to water a lawn is to apply water when it begins to show signs of stress from the lack of water. Watering only when needed and watering thoroughly produces a deep rooted lawn which is more water efficient and drought tolerant.

Amount of Water to Apply

The key to watering lawns is to apply the water as infrequently as possible yet thoroughly to a depth of 4 to 6 inches. If the lawn is watered too lightly and frequent, the lawn tends to be shallow rooted, which makes it more susceptible to heat and drought stress.

Lawns in South/Central Texas need only one inch of water per week either by rainfall or by irrigation system to maintain a healthy drought tolerant green lawn.

How to Water Your Lawn

Water should never be applied at a rate faster than it can be absorbed by the soil. If too much water is applied it runs off and is wasted. *An efficient watering wets only the turfgrass rootzone, does not saturate the soil and does not run off.*

The time of day to water your lawn is also important. Watering during the hot part of the day can waste water by excessive evaporation and can scald the lawn. Also avoid watering during windy conditions. The best time for lawn watering is in the cool part of the day, normally, early morning.

1988 PARADE OF HOMES

As part of the District's continuing efforts in the area of water conservation the District is sponsoring two exhibits at the 1988 Greater San Antonio Builders Association Parade of Homes. This year's Parade of Homes is to be held at the Oakwell Farms, May 21 through May 30, 1988.

One exhibit at the 1988 Parade is a Xeriscape demonstration at the Ridgemont Builder's home. This home will have all the latest water conserving technologies incorporated into the xeriscape. The xeriscape will contain native and adaptive plants as well as a very efficient "xerigation" (irrigation) system. Also during the Parade, landscape architects, contractors, and irrigators will be staffing a gazebo located in the front yard of the Xeriscape demonstration to answer Xeriscape questions.

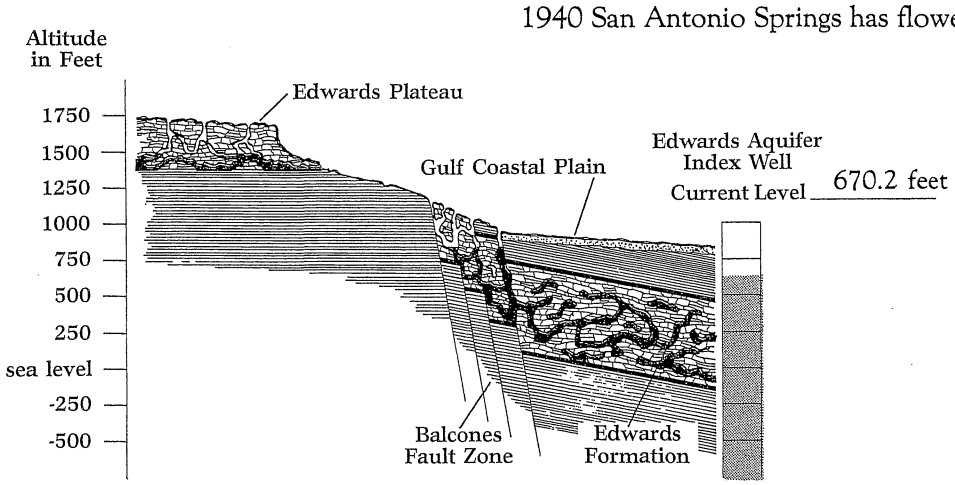
The District will also have the exhibit "The Aquifer that Shaped South Texas" on display in the 1988 Parade of Homes Home Product Show. More information about the hours and location of the 1988 Parade of Homes can be obtained by calling the Greater San Antonio Builders Association at 696-3800.

EDWARDS AQUIFER INDEX WELL

On May 2, 1988 the water elevation at the Edwards Aquifer, Bexar County index well (AY-68-37-203) was recorded at 670.2 feet above men sea level (AMSL). The water elevation has decreased 14 feet since January 1, 1988. The May historical average water elevation (1932-1988) for the Bexar County index well is 665.4 feet AMSL.

San Antonio Springs, natural headwaters of the San Antonio River, cease to flow when the water elevation is between 670 and 665 feet AMSL. The five foot range in elevation is due to the varied elevations of the numerous spring outlets. San Pedro Springs, located in San Pedro Park in San Antonio, will also cease to flow when the water elevation at the Bexar County Index Well falls below 662 feet AMSL.

Historical data indicates that San Antonio Springs flowed continuously between 1892 and 1939. Since 1940 San Antonio Springs has flowed intermittently.



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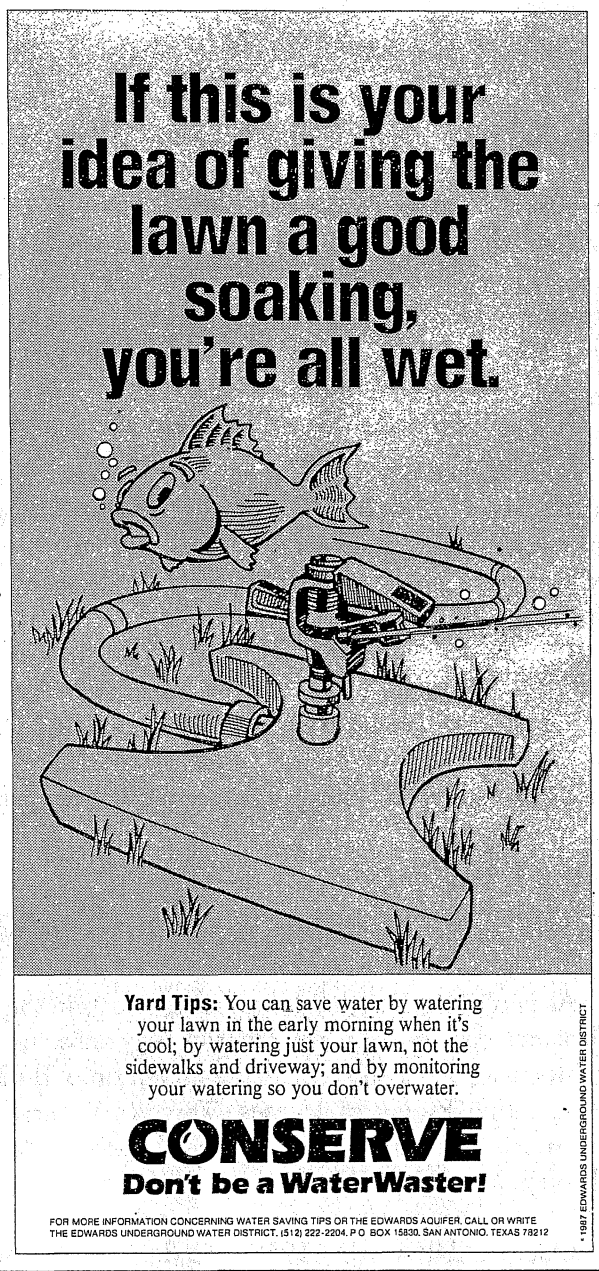
ADDITIONAL EDWARDS RECHARGE ZONE SIGNS ERECTED

The District is presently having 15 signs erected throughout the District designating the boundaries of the Edwards Aquifer recharge zone. This brings the total numbers of signs indicating the location of the recharge zone to 21. These signs are being erected as part of the District's public information program to better educate the residents of the Edwards Aquifer on the boundaries of this very important and sensitive area.

WATCH OUT!

Be watching for an additional public information program to be instituted this spring and summer by the Edwards Underground Water District. "Aquifer Watch" will provide information to the public advocating voluntary limitations on landscape watering.



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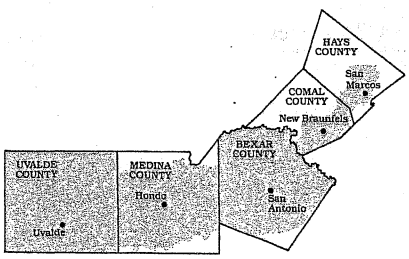

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THE WATER LEVEL

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JULY & AUGUST 1988 VOLUME 5 EDITION 4

CONSERVATION: WATER FOR THOUGHT

EDWARDS UNDERGROUND WATER DISTRICT HOSTS REGIONAL WATER CONSERVATION SUMMIT

A major water conservation initiative took place in San Antonio on June 17, 1988 a Regional Water Conservation Summit. The Water Conservation Summit was organized by the Edwards Underground Water District and the City of San Antonio Joint Committee for Water Resources as a regional one-day meeting of public officials to assess attitudes toward water conservation and begin to stimulate further initiative for action. Approximately 130 persons attended the summit representing federal, state, regional, and local governments, and public and private water purveyors.

Attendees to the Summit were briefed on the fundamental concepts of water conservation planning and implementation. Presentations included information about the Edwards Aquifer and the status of regional water resource planning, water conservation as a resource, the Edwards Underground Water District's 17 percent water conservation goal, and San Antonio's commitment to water resource management and water conservation.

By the end of the conference, attendees were in general agreement about the need to conserve water. In an informal poll, the attendees agreed to:

- take the information back to their constituents through local media
- promote educational programs in schools on water conservation
- attempt to pass local ordinances to bring about meaningful water conservation.

THE NEED FOR A COMPREHENSIVE WATER CONSERVATION PROGRAM

The need for a comprehensive water conservation program within the Edwards Aquifer region comes from the interactions of several factors. First, natural recharge to the aquifer is a function of rainfall. The aquifer region is characteristically semi-arid with limited rainfall and aquifer recharge. Data collected for over 50 years indicates that the Edwards Aquifer has an average annual recharge of approximately 600,000 acre-feet. Secondly, the Edwards Aquifer is the sole source of water for approximately 1.2 million persons in the five-county aquifer region. The aquifer water not only serves the urban areas of Greater San Antonio, New Braunfels, San Marcos, and smaller communities but also serves as the source of irrigation water in the western rural communities of Uvalde and Medina counties, as well as providing water downstream from spring discharges. Growth has resulted in continually increasing water demands and periodic overdraft of the aquifer in years of less than normal rainfall. Finally, further population growth is anticipated in the aquifer region. These results point to the possibility that in the near future water demand will continually exceed the average annual recharge.

When the water demand exceeds the average annual recharge for a period of years, we know that two things will happen:

(1) water elevations throughout the region will decline and Comal springs and San Marcos springs will cease to flow
(2) pumping costs will increase.

Scientific research indicates 2 things may happen:

(1) in some areas, particularly along the northern edge of the recharge zone, water wells may cease producing water entirely
(2) water quality may deteriorate to the point of requiring treatment in certain areas.

MAKING CONSERVATION HAPPEN

Natural resources like water present difficult problems for policy makers and water users in terms of integrating beliefs and practices. Residents may believe that water conservation is important but unless there are personal benefits in reducing individual water use, people find it difficult to justify personal sacrifices.

The overall water conservation goal of the Edwards Underground Water District is a 17% reduction in total water demand based upon 1985 water use statistics. To accomplish this goal the District plans to develop a Regional Water Conservation Plan that will serve as a model for municipalities and utilities in developing individual plans.

The regional plan will incorporate the individual water conservation plans of the various entities and water utilities. The regional water conservation plan will be a combination of measures including:

- public and school education programs to develop wise water use practices
- restructuring water rates to encourage conservation through increasing block rates, seasonal peak rates, and excess use penalties
- institution of leak detection programs
- building code amendments to require installation of water-conserving fixtures and appliances in all new construction
- ordinances requiring retrofit of existing structures with water-conserving devices upon sale or structural remodeling
- ordinances and education programs to reduce the use of water in urban landscape irrigation
- retrofitting of public facilities with water-conserving fixtures and more efficient landscape irrigation.

In the development of the Regional Water Conservation Plan the Water Conservation Committee of the Edwards Underground Water District plans to organize a Regional Water Conservation Task Force made up of representatives from public and private

water purveyors. The task force will review the different water conservation measures and programs to ensure a uniform approach to reducing demands on the Edwards Aquifer.

As this effort takes shape individuals interested in water conservation should contact their respective elected officials.

WATERING YOUR SOUTH TEXAS LAWN

Lawn watering accounts for approximately 35 to 40% of residential water use. Knowing how much to water and when to apply this water is important in maintaining an attractive lawn while still conserving water.

An efficient watering program must include three basic steps:

1) Determining when to water
2) Determining how much water should be applied
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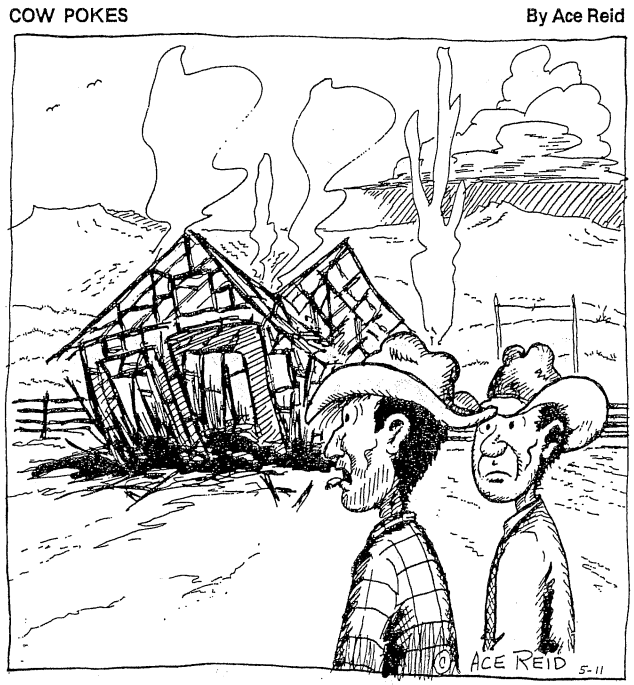
Determining When to Water

The most efficient way to water a lawn is to apply water when the lawn begins to show signs of stress from lack of water. Watering only when needed and watering thoroughly produces a deep-rooted lawn which is more water efficient and drought tolerant.

Amount of Water to Apply

The key to watering lawns is to apply the water as infrequently as possible yet thoroughly to a depth of 4 to 6 inches. If the lawn is watered too lightly and frequently, the lawn tends to be shallow rooted, which makes it more susceptible to heat and drought stress.

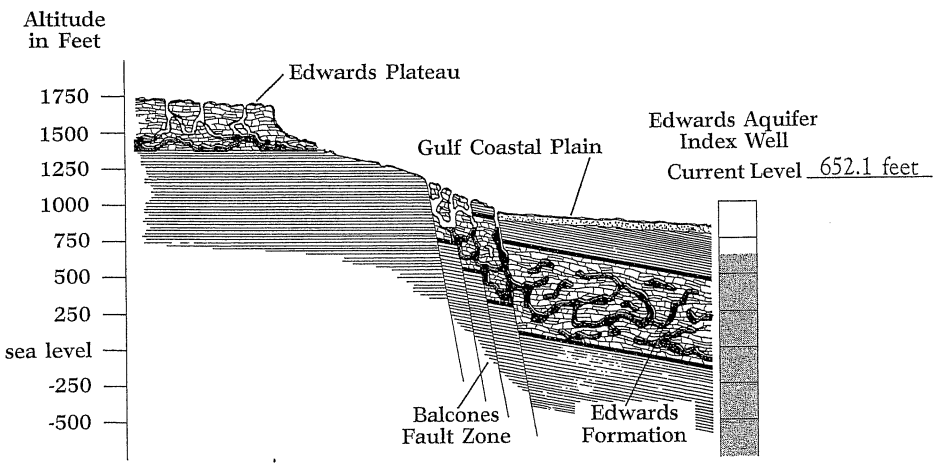
Lawns in South/Central Texas need only one inch of water per week either by rainfall or by irrigation system to maintain a healthy drought-tolerant green lawn.



WUL THAT WUZ A HECK OF A SHOWER. SIXTEEN SPRINKLES AND ONE BOLT OF LIGHTNING!

How to Water Your Lawn

Water should never be applied at a rate faster than it can be absorbed by the soil. If too much water is applied it runs off and is wasted. An efficient watering wets only the turfgrass root zone, does not saturate the soil, and does not run off. *(Continued)*



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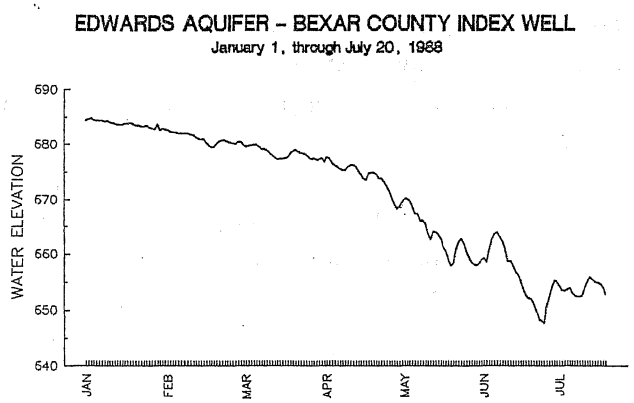
The time of day to water your lawn is also important. Watering during the hot part of the day can waste water by excessive evaporation and can scald the lawn. Also avoid watering during windy conditions. The best time for lawn watering is in the cool part of the day—normally, early morning.

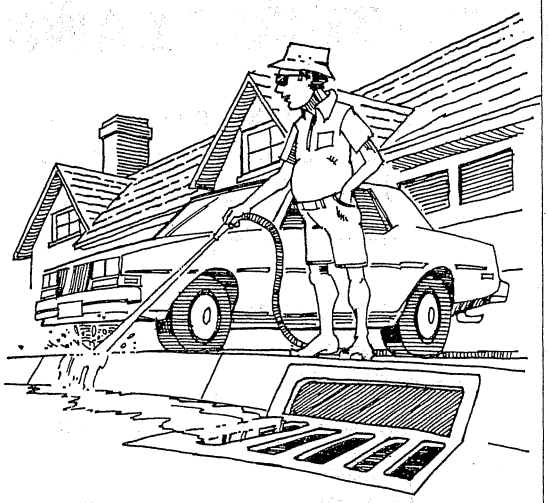
EDWARDS AQUIFER INDEX WELL

On July 20, 1988, the water elevation at the Edwards Aquifer Bexar County index well (AY-68-37-203) was recorded at 652.1 feet above mean sea level (AMSL). The water elevation has decreased 30.5 feet since January 1, 1988. The July historical average water elevation (1932-1987) for the Bexar County index well is 661.0 feet AMSL.



Water Elevations in feet above mean sea level

If this is your idea of cleaning up, you're all wet.



Cleaning Tips: You can save water by using a bucket and rags or a shut-off valve on your hose instead of letting the water run when you wash your car, and by not washing your driveway and sidewalks with water.

CONSERVE
Don't be a WaterWaster!

FOR MORE INFORMATION CONCERNING WATER SAVING TIPS OR THE EDWARDS AQUIFER, CALL OR WRITE THE EDWARDS UNDERGROUND WATER DISTRICT, (512) 222-2204, P.O. BOX 15830, SAN ANTONIO, TEXAS 78212.

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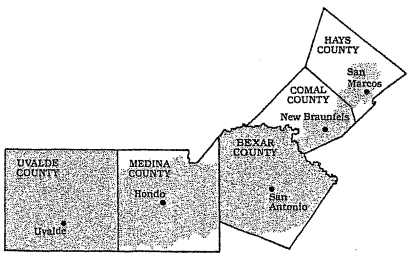

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THE WATER LEVEL

A Water Conservation Publication of the Edwards Underground Water District

SEPTEMBER & OCTOBER 1988 V.5, #5

WATER CONSERVATION SUMMIT RESULTS IN TASK FORCE:

LEAK DETECTION UNIT TO BE PURCHASED

The Board of Directors of the Edwards Underground Water District, recognizing the need for continuous and intensified water conservation programs, has approved funds in the 1988-89 fiscal year budget for the acquisition of a state-of-the-art computerized leak detection unit, a van to house and transport the unit and staff to operate it. The idea to purchase this leak detection equipment originated from the first meeting of the Bexar County task force on water conservation, led by Bexar County Board Member, Fay Sinkin. The task force on water conservation voted unanimously to propose the purchase of the equipment to the full Edward Board of Directors.

Leak detection and repair are important for the following reasons:

1. Repair of Leaks saves water!
2. Pinpoint leak detection reduces excavation costs that are experienced during repair.
3. Public liability risk are reduced.
4. Many leaks can go undetected because they are not easily located from surface inspection.

The Edwards Underground Water District will make this leak detection service available to all utilities within District's five county region.

District staff are presently accepting bids for the purchasing of the equipment and hope to have it purchased and ready for use within the 1988-89 fiscal year.

MORE SUMMIT RESULTS

FIRST WATER CONSERVATION TASK FORCE MEETING

The first Bexar County Water Conservation Task Force meeting was held on Tuesday, August 30, at 7:00 p.m. Task Force members represented different parts of Bexar County, including Converse, Hill Country Village, Castle Hills, Helotes, Alamo Heights, Leon Valley, Universal City, Selma, Shavano Park, Fair Oaks, and the City of San Antonio.

Guided by Bexar County, Edwards Underground Water District Director, Fay Sinkin, the Task Force members discussed ways their respective communities could begin conserving water, and what they as policy and decision makers can do to promote water conservation.

A Leak Detection program was discussed as a possibility to begin conservation throughout the five county district. As a result of this discussion, monies have been allocated in the Edwards Underground Water District 88-89 budget for a leak detection system.

The Bexar County Task Force is one of a number of task forces being formed in the five counties of the Edwards District as a direct result of the Water Conservation Summit held June 17, 1988.

WATER CONSERVATION WORKING HANDBOOK

After initial meetings with the county-wide task forces, a Water Conservation Working Handbook, developed by the Edwards Underground Water District will be distributed to each task force member. This Working Handbook will be used to identify ways cities and communities can conserve water. The Handbook has eight sections that cover topics that include:

- Water Rate Structures
- New Construction
- Xeriscape Ordinances
- Retrofit of Existing Structures
- Leak Detection
- Water Reuse and Recycling
- Public Awareness and Education
- Implementation

Each section includes case histories from other areas of the United States followed by recommendations for local action.

The Working Handbook will serve as a guide from which area task forces can develo ordinances regarding water conservation.

ATTENTION ELEMENTARY SCHOOL TEACHERS!

The Edwards Underground Water District is currently developing new educational workbooks for elementary schools within the District's five county region. These workbooks, entitled "SPLASH," are being developed in two volumes. Volume one will be for primary grade levels 1-3 and volume two for intermediate grade levels 4-5. "SPLASH" was created for the Edwards Underground Water District by Sandra Vinson, a Northside Independent School District gifted and talented elementary teacher.

The "SPLASH" workbooks will cover many topics relative to water resources in the Edwards Aquifer region. The activities covered in these workbooks will be designed not only to educate the student on the importance of water conservation, but to enhance skills in the areas of science, history and math, as well as spark creativity.

The workbooks will be sent to each elementary school teacher throughout the Edwards Underground Water District. Keep on the lookout for "SPLASH," it will be arriving very soon.

XERISCAPE?

Xeriscape. The conservation of water through creative landscaping. Xeriscape comes from the Greek word Xeros, meaning "dry."

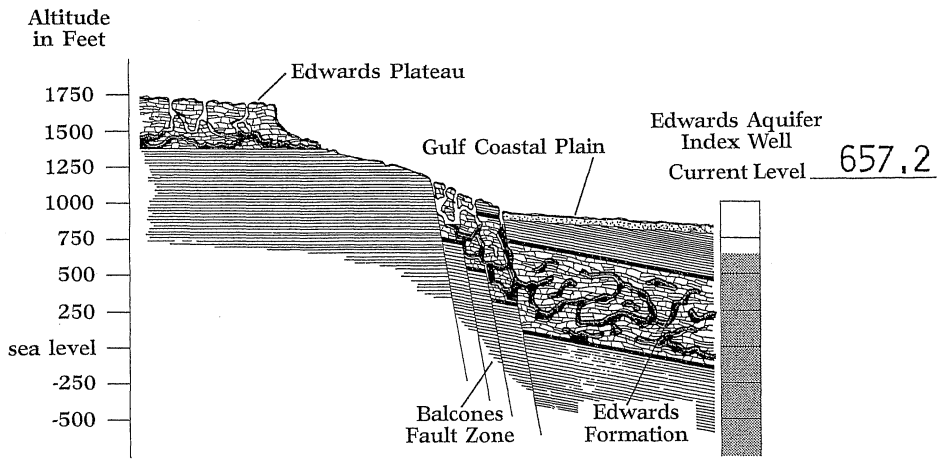
Xeriscape emphasizes water conservation in the landscape. It is based on seven principles that can be applied to any landscape.

The seven principles of Xeriscape are:

- Start with a good design
- Improve the soil
- Use mulch
- Limit lawn areas
- Choose low-water use plants
- Water efficiently
- Practice good maintenance

The Edwards Underground Water District provides Xeriscape brochures for anyone interested in Xeriscaping. This brochure has the seven principles of Xeriscaping, illustrates a South/Central Texas Xeriscape and provides an exhaustive list of Xeriscape plants.

Please feel free to call the Edwards Underground Water District for your Xeriscape brochure at (512) 222-2204 or 1-800-292-1047.



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EDWARDS UNDERGROUND WATER DISTRICT
&
SAN ANTONIO ZOOLOGICAL GARDENS
AND AQUARIUM

NEW ZOO BROCHURE

A new brochure has been developed by the Edwards Underground Water District to enhance the exhibit on the Edwards Aquifer located at the San Antonio Zoo's Freeman Aquatic Building. The brochure, which is presently available at the zoo, describes the Edwards Aquifer, it uses and offers water conservation tips. The inside of the brochure has many colorful drawings of the various species of wildlife in South Texas that rely upon the fresh clean waters of the Edwards Aquifer. This brochure also contains a quiz to test your knowledge of the Aquifer and a free ticket to admit one child on your next trip to the zoo.

• PRESENT AN EXHIBIT ON •

THE EDWARDS AQUIFER

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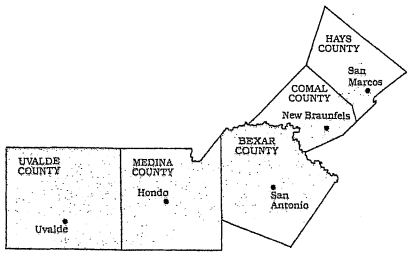

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THE WATER LEVEL

A Water Conservation Publication of the Edwards Underground Water District

NOVEMBER & DECEMBER 1988

V.5 #6

FUNDING BOOST FROM EDWARDS UNDERGROUND WATER DISTRICT SUPPORTS CITY OF SAN ANTONIO IN PROMOTING WATER PROGRAMS

The Board of Directors of the Edwards Underground Water District approved a $570,000 water program grant on November 21, 1988 for the city of San Antonio. $310,000 will be used for water conservation programs and $260,000 will be used for water quality programs.

Budgeted items included in the Water Conservation program are education, public information, facility and landscape retrofit and a turf management technical assistance program. Items budgeted for Water Quality are development of a risk assessment model to protect the aquifer from pollution, the creation and expansion of monitoring systems, such as three automatic water samplers and water sample collection analysis, and finally, water pipe inspection process improvement and expansion.

This joint effort by the Edwards Underground Water District and the City of San Antonio is a giant step toward protecting the Edwards Aquifer through water conservation and water quality monitoring.

It is the District's desire that other cities and purveyors will also begin water conservation and water quality programs to protect the future of the Edwards Aquifer.

XERISCAPE AWARD

The South Central Texas Xeriscape Committee of San Antonio, of which the Edwards Underground Water District is the founding member, was recognized for its outstanding work at the third annual Texas Xeriscape Conference held in mid-October.

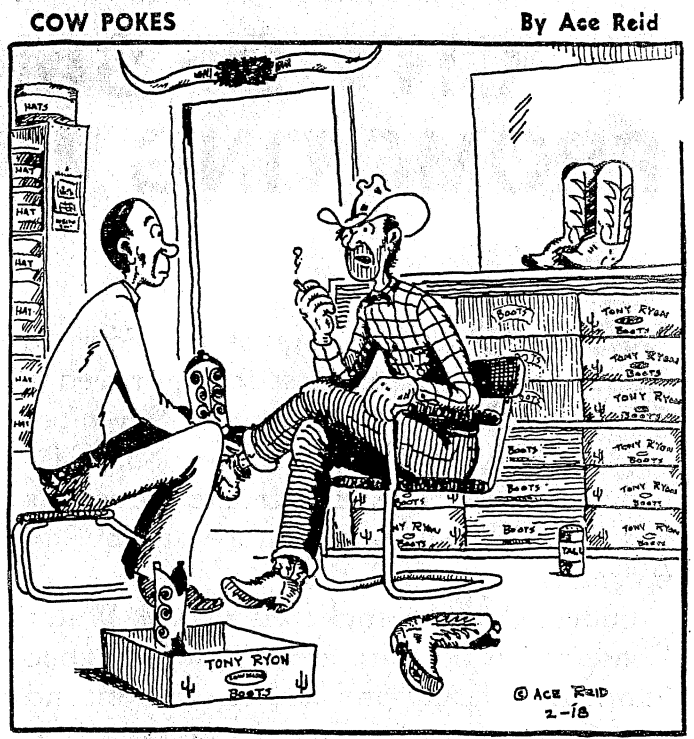
Conducted at the College Station Hilton and Conference Center and Sponsored by the Texas Agricultural Extension Service, the Texas Xeriscape Conference is an exhaustive introduction to and update of xeriscape in Texas. This year, representatives from all over the state gathered to hear speakers presenting various facets of xeriscape in Texas.

Session topics included:

- Xeriscape Design
- Installation and Maintenance
- Plant Materials
- Irrigation

Speakers at the conference were from the Lower Colorado River Authority, Texas A&M, National Xeriscape Council, Inc., the McAllen Parks and Recreation Department and other organizations working with xeriscape in Texas. The keynote address was delivered by Randall Ismay, Landscape and Water Management Consultant from Los Angeles, California.

Formed in 1983, the South Central Texas Xeriscape Committee which includes representatives from the Extension Service, San Antonio Botanical Center, San Antonio River Authority, Edwards Underground Water District and the local green industry is the first such educational group in the state. In 1985 the committee completed its first xeriscape demonstration garden east of the Rocky Mountains at a cost of $120,000. Located at the San Antonio Botanical Center, the garden has served as a living textbook of xeriscape principles. The committee has also developed xeriscapes around houses in the annual San Antonio Parade of Homes.



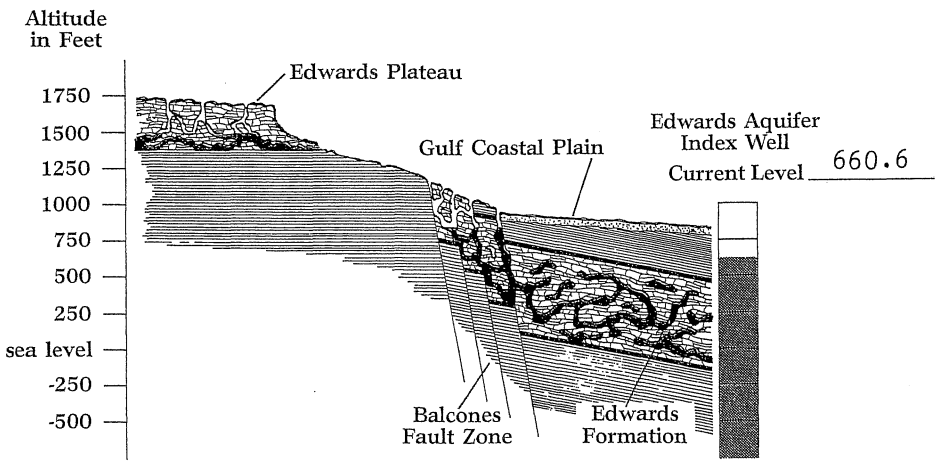
"As dry as it is you better sell me camel's hide boots. I don't believe them cowhide boots could make it from one water hole to the other!"

ESSAY CONTEST CREATES OVERWHELMING RESPONSE

Up to 456 awards will be presented to the winners and "Certificates of Participation" will be distributed to all other entrants. An "Award of Excellence" will be awarded for the best essay in each grade level in each school and the best essay in each grade among private schools in each of the five counties. Highest recognition will go to the overall best essays in each grade level in each county. These "Circle of Honor" members will receive handsome certificate plaques.

Letters introducing the essay contest, accompanied by mail-back "interest" forms, were sent to school principals during teacher in-service in late August. Follow up information packets including rules, entry forms and free bumper stickers for entrants are currently being mailed to all responding teachers. Almost three-fourths of the eligible districts and many area private schools have demonstrated interest in participating in the contest.

The deadline for entries is mid-December and awards will be presented in May 1989.



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COMING ATTRACTION:
New Edwards Aquifer Video

The Edwards Underground Water District (EUWD) and the San Antonio Museum Association (SAMA) proudly announce a joint effort to produce a 15 minute video documentary about the Edwards Aquifer. To be shown regularly at the Witte Museum, the video delves into all facets of the Edwards Aquifer. Part I establishes the aquifer as the primary source of water for South Central Texas. In Part II, illustration and computer animation bring to life the development and hydrogeologic processes of the Edwards Aquifer. From dinosaurs to ancient camels to the present-day blind salamander, the documentary also carries viewers through the evolution of wildlife in the aquifer region. Live-action cinematography in Part III helps demonstrate the aquifer's excellent water quality and depicts some of the many threats of depletion and pollution of this strategic water supply.

The new Edwards Aquifer video will replace the film entitled "The Edwards Story." The video will be placed in the EUWD public information education library and will become a part of the on-going effort to inform and educate the public. The video will be available for use by schools, civic groups and other interested organizations.

Russell Masters, General Manager of the Edwards Underground Water District, stated the video's purpose: "to provide a high-quality, entertaining and informative message that will be yet another way to educate the public about the value of the Edwards Aquifer."

Sara Kerr, Associate Curator of Natural Sciences for SAMA, will produce the video and cinematographer Ron Zimmerman will direc it. The production is scheduled for completion in the fall of 1989.

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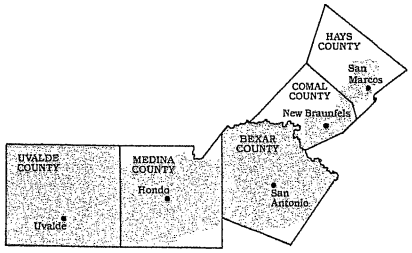


ADDRESS CORRECTION REQUESTED

THE WATER LEVEL

A Water Conservation Publication of the Edwards Underground Water District

JANUARY & FEBRUARY 1989

#1 of 2

DISTRICT PURCHASES WATER FOR NEW BRAUNFELS TREATMENT PLANT

On January 12, 1989, the Edwards Underground Water District's Board of Directors approved $1.5 million for the purchase of surface water from Canyon Lake for New Braunfels Utilities' proposed water treatment plant. The money would be provided to purchase 6,700 acre feet of water per year from the Guadalupe-Blanco River Authority. The District agreed to pay the current rate of $44.75 per acre foot, with New Braunfels Utilities funding any increase in this cost over the 5-year span.

Bob Sohn, General Manager for New Braunfels Utilities, welcomed the agreement as "a significant precedent that the Edwards Underground Water District has set demonstrating its support of pursuing alternative sources of water to that of the Edwards Aquifer.

We are very, very happy and feel fortunate that the District has decided to work with New Braunfels Utilities on this project."

The New Braunfels plant will treat an additional 2,200 acre feet of water to be withdrawn from the Guadalupe River in trade for water from the Comal River. Both the Edwards Underground Water District's and New Braunfels Utilities' efforts will result in reduced pumpage from the Edwards Aquifer.

Awarding of the funds is pending acceptance of the final contract.

EUWD WELCOMES NEW BOARD MEMBERS

On Saturday, January 21, 1989, Bexar County voters elected 4 new members to the EUWD Board of Directors.

One of three existing countywide seats as well as three newly created board positions selected by County Commissioner's precincts were up for election. All four winners are new to the board.

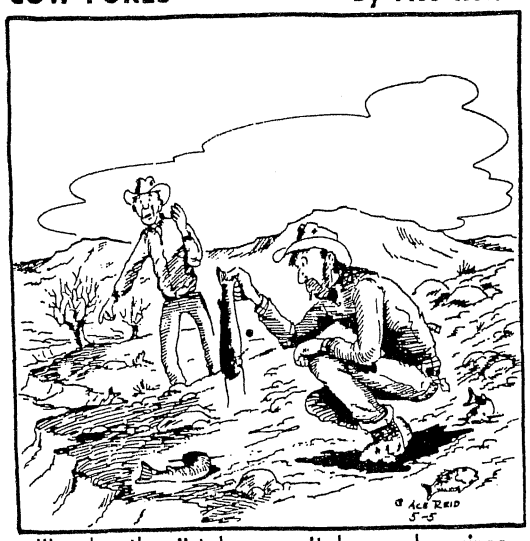
Charles F. Rodriguez, Vice-President of Operations for R&R Sales Co. won the at-large position with 37% of the vote. The former research chemist for S.W. Research, says he, "invites all interests in the community to share their ideas and concerns," as he works toward assuring a "high quality of water in quantities adequate for everyone's use."

In Precinct 1, Jo Ann DeHoyos, an attorney in private practice, won with 41.7% of the vote. "I am anxious to get to work," DeHoyos said. "We have to create a new water awareness. As public servants we must think beyond our own generation."

Precinct 2 was won by Jesse Zuniga an employee of the Federal Equal Employment Opportunities Commission. Zuniga a proponent of water conservation and a strong Regional Water Plan won with 33.9% of the vote.

Lynda Billa Burke, a Marketing Specialist won in Precinct 4 with 52.7% of the vote. Burke, a supporter of the Drought Management and Regional Water Plans said, "Without water, the area will not be able to grow and the quality of life in the area will be hurt."

Also winning re-election to the board were Dr. Kenneth Ikels Ph.D. of Comal County and Frances Emery of Hays County. Both candidates were unopposed.



"I reckon they jist drown . . . its been so long since they've seen rain or high water."

MEDINA AND UVALDE COUNTIES VOTE TO WITHDRAW FROM EUWD

Also passing on the January 21, 1989 ballot was the withdrawal of Medina and Uvalde counties from the EUWD. Despite that withdrawal, the District will continue, for the benefit of all users of the aquifer, its data collection activities in those counties without interruption.

Since its creation in 1959, the District has initiated much of the groundwater resource planning and water conservation programs within the region. Through the use of hydrologic studies, data collection and monitoring programs conducted by the EUWD in cooperation with the U.S. Geological Survey, the District has been able to identify potential problems and implement solutions. In Medina County 4 recharge dams have been constructed to capture flood flow, allowing it to percolate into the ground, increasing the average annual recharge by approximately 5,360 acre feet. (1 acre foot = 325,851 gallons.) Through the use of continuous recording devices at select wells throughout the aquifer area, the District monitors water levels in each county as well as the quality of the water moving through the aquifer. In Uvalde County, as a direct result of the District's ongoing monitoring programs, it was determined that a well was contaminated by hazardous chemicals. After verification of contamination, the District initiated an investigation to determine the source area and is currently working with the Texas Water Commission and environmental consultants to see that remedial steps are taken.

Although the counties have voted to withdraw and taxes will no longer be collected in Medina and Uvalde counties, the District will continue an active role in data collection throughout the region in its mission to conserve, protect and preserve this water resource.

DISTRICT HIRES FIVE EMPLOYEES

Kelly Morris recently assumed the newly created position of Public Information Coordinator for the Edwards Underground Water District. With over ten years' experience in public relations in South Central Texas, Kelly offers a wealth of expertise and knowledge in an area of ever-increasing importance as 1989 promises to be a groundbreaking year for the District.

Kelly's background as Director of Marketing and Community Relations for the Southwest Craft Center has involved her in all facets of an effective public information program. She has developed and implemented marketing, and direct mail campaigns as well as formulated administration system vital to the Center's organization.

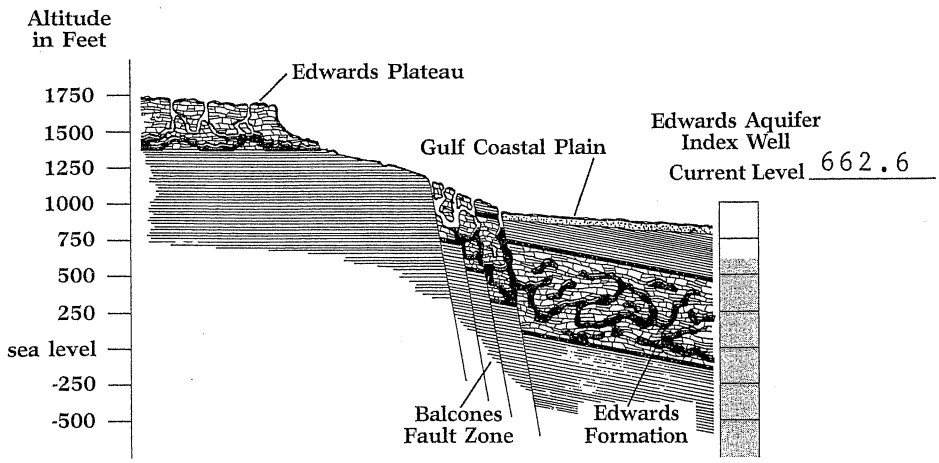
"I am excited to be a part of the Edwards Underground Water District," Kelly said, "particularly at this point in its history. In 1989 the District will celebrate its 30th anniversary, continue to work toward the passage of legislation that would put into effect a much-needed regional water resources management plan and expand existing conservation initiatives. I look forward to the challenges ahead."

The new Public Information Coordinator will be responsible for planning, organizing and directing all public information programs and activities of the District.

Jim Shipley was hired in early January to operate the new leak detection system purchased by the District. Along with 14 years' experience in water system operation, Jim has completed numerous courses conducted by Texas A&M's Water and Wastewater Training Division. Installation of the District's leak detection system into a van has just been completed and testing will begin soon.

"I am pleased to join the Edwards Underground Water District team at this time," Jim said. "Public awareness of water conservation and related water issues is at an all time high in the area. The purchase of state-of-the-art leak detection equipment gives us another tool to assist the water conservation and loss prevention programs. I am looking forward to working closely with the utility operators in the District."

Other new employees include Randy Williams, Water Resources Technician, Sylvia Johnson, Technical Secretary and Mai Davis, Accounting Clerk.



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THIRD COUNTY-WIDE WATER CONSERVATION TASK FORCE FORMED

Hays County joined Bexar and Comal on January 25, 1989, in forming its own county-wide Water Conservation Task Force. Spearheaded by the Edwards Underground Water District, the formation of these task forces underlines the District's commitment to promoting the development and use of new technologies and practices that improve water use efficiency at a local level.

Conservation Task Forces are coordinated by EUWD Board members representing their respective counties and include county, city, and public utility officials.

Task Forces members are given a Water Conservation Working Handbook, written by District conservation staff, which effectively outlines solid conservation measures and implementation procedures.

Through participation in these Conservation Task Forces, local decision makers will be able to make informed recommendations regarding water-conserving actions in their particular community.

Already the positive effects of these local task forces can be felt. As a direct result of the first meeting of the Bexar County Task Force, a state-of-the-art leak detection unit will be made available to all utilities and water purveyors within the Edwards Underground Water District.

Through participation in local Water Conservation Task Forces, each county will join the Edwards Underground Water District in working toward a regional goal of establishing effective, long-term water resource management.

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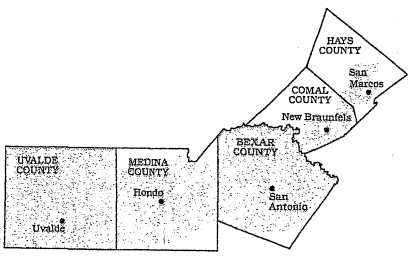

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