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THE WATER SOURCE

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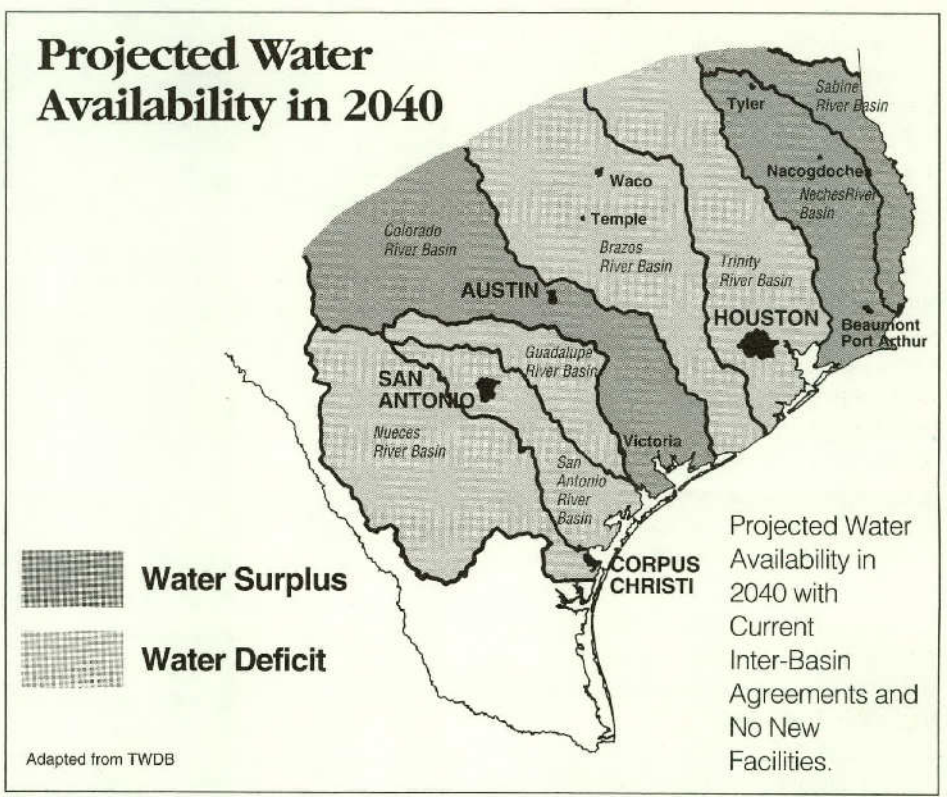
Trans Texas Water Program: Alternatives for the Future

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The Trans Texas Water Program is a long-term project representing a new and innovative approach to water resource planning and development for Texas. Some areas, such as Southeast Texas, have an abundant supply of water, while other areas with high demands, such as Houston and San Antonio, could be left with a potential shortfall. Trans Texas proposes to move water from river basins which have a surplus to areas which have a deficit. This will require that water be moved by pipeline from east to west, across southeast and south central Texas (see map). The program's mission is to determine the best method of providing supplies to meet Texas' needs in a cost-effective and environmentally-sensitive manner, as well as examine local alternatives for water supplies.

The large scale diversions proposed by Trans Texas are a departure from the historic pattern of water resource planning and development in Texas. This change in concept will not come easily. Yet none of the state, regional or local agencies with water resource responsibilities can dispute the obvious need for making more efficient use of existing resources, nor the opportunity which Trans Texas will provide to accomplish that end.

Projected Water Availability in 2040



Background

The historic development of water resources in the state has been on a river basin-by-river basin basis. Generally, new surface water projects have been constructed in each basin in response to needs that have arisen. This pattern of development has created a prejudice

against trans basin diversions, fostering a sense of "let's keep our supplies at home." If Trans Texas is to be successful, this attitude will be a significant obstacle which must be overcome.

The lead agency promoting Trans Texas is the Texas Water Development

(continued)

Study Determines Aquifer's Storage Capacity

There may be as much as 215 million acre-feet of ground water stored in the Edwards Aquifer according to a study conducted by the Bureau of Economic Geology (BEG) for the Edwards Underground Water District (EUWD).

This is the best estimate to date of how much water can be stored in the total pore spaces of the Edwards Aquifer, but EUWD and BEG geologists caution that it does not mean all the water is recoverable. According to Rick Illgner, Acting General Manager of the EUWD, the next step is to determine how much of the water can be retrieved and how it moves through the aquifer. "The Bureau of Economic Geology helped determine how much water the aquifer could hold. Next we need to know how attainable it is."

The previous estimate of 25 to 55 million acre-feet was derived from a study conducted by the United States Geologic Survey in 1989. It is an estimate of the amount of water which can be drained from the aquifer (net storage), and was calculated using eight wells across the 176 mile-long aquifer.

In comparison, the BEG evaluated hundreds of geophysical well logs. Data from the geophysical logs was used to construct a stratigraphic model of the Edwards Aquifer which shows the different layers in the aquifer and where the water is stored.

Hydrologist Dr. Alan Dutton was the research scientist in charge of the study for the BEG. He points out that the previous number was not an estimate of total storage, but an educated guess of how much water could be recovered. "What we [the BEG] have given the District is the first ever quantifiable, reproducible estimate of total water in storage." Dutton continued, "The amount



of water that is recoverable depends on the relationship between the volume of water that can be discharged and the corresponding change in water level. Once you determine how far the water level is going to drop in an area, it becomes a policy issue ... what are the consequences of a drop in water levels?"

Water in the Edwards Aquifer is under pressure because it is confined between layers of nonporous rock. However, there is a narrow portion of the aquifer along the northern boundary of the recharge zone which is unconfined.

The BEG estimates there are 156.5 million acre-feet of water in the confined zone of the Edwards Aquifer, and 58.5 million acre-feet in the unconfined portion. Changes in the amount of water actually present in the aquifer occur in the unconfined portion, allowing the confined part to remain fully saturated.

Thus the change in the water level in the confined zone reflects the regional change in water pressure as water fills and drains in the unconfined zone.

The total usable amount of water in the Edwards Aquifer depends on variables such as storage capacity in the confined zone, the amount of water held in the unconfined zone, and saline water intrusion.

According to Dutton, the number of 215 million acre-feet is not important. "The BEG contributed a building block in the form of a computer model which shows where the water is." Results from this study will be used to begin the development of an interactive, dynamic 3-D model of the Edwards Aquifer. The model will assist scientists in understanding the intricate workings of the aquifer and can be modified and expanded as new information from future studies becomes available. ■

Trans Texas *(continued)*

Board (TWDB). This activity represents a new role for an agency which has traditionally been responsible only for planning and financing at a state level. For the first time, the TWDB is initiating a cooperative effort between state, local and regional water agencies.

The Texas Parks and Wildlife Department and the Texas Natural Resources Conservation Commission also have a management role. These agencies were instrumental in prescribing a uniform set of environmental criteria for the technical analyses performed as part of the program.

Goals & Objectives

Trans Texas will be carried out in several phases. Phase I will last eight months and tabulate water demands for a fifty (50) year period, as well as describe a menu of water supply alternatives. Phase II will entail a more detailed analysis of the feasibility of alternatives selected from the menu prepared in Phase I. Later phases include permitting, construction, and operation of alternatives selected for development.

Three Areas

The Trans Texas Water Program has been divided into three study areas: West

Central, Southeast, and South Central. The West Central area encompasses the Edwards Aquifer region, including the Guadalupe, San Antonio, and Nueces River Basins. The City of San Antonio is the major demand center. The Southeast area extends along the Texas Gulf Coast from the Sabine River in the east to the Brazos River in the west, and includes the Houston metropolitan area. The South Central area encompasses the region west of the Brazos River, including the lower Lavaca, Guadalupe, and Nueces River Basins. The City of Corpus Christi is the major demand center.

West Central Study Area

The Edwards Underground Water District is a major sponsor in the West Central study area. Other sponsors include the San Antonio River Authority, the San Antonio Water System, Bexar Metropolitan Water District, the Lower Colorado River Authority, the Guadalupe-Blanco River Authority, and the Nueces River Authority. Currently in Phase I, the West Central study area is compiling water demands for the fifty year planning period. Forty-five (45) water supply alternatives are being analyzed for their potential for meeting future demands.

Conservation, reuse, recharge of the Edwards Aquifer, surface water supplies, groundwater sources, and aquifer storage and recovery are some of the alternatives being examined. Importing water from the Southeast area is a part of the surface water supply investigation.

Importance to the Edwards Aquifer Region

The alliance of water interests in the West Central study area forged through the advent of Trans Texas represents the best opportunity to date to seriously address the water supply needs of the area on a region wide, non-competitive, non-partisan basis. The timing could not be better for water users in the Edwards Aquifer region as they move toward regulation and more aggressive management of the aquifer. Water users, both present and future, will profit from the evaluation of alternative supplies that is being conducted through Trans Texas. The interaction among the agencies responsible for water resource development and use in the region will result in consensus on which alternatives are necessary, and which are the most feasible. Such consensus is significant for addressing the actual development of alternatives to supplement the Edwards Aquifer. ■

Catfish Farm Lawsuit Settled

The governing bodies of the Edwards Underground Water District (EUWD), San Antonio River Authority (SARA), the Texas Natural Resources Conservation Commission, and Bexar County have approved the terms of an agreement settling the lawsuit against the owners of Living Waters Artesian Springs (LWAS), otherwise known as the "Catfish Farm."

The lawsuit was filed in State District Court, in October of 1991, by the EUWD and SARA and resulted in immediate closure of the operation's main well. District officials estimate that since the well was closed, an estimated 95,000 acre-feet of water have been saved.

One of the provisions of the settlement agreement is a permanent injunction that will prevent the owners from reopening the well. The injunction will be in place until the owners receive a withdrawal permit from a permitting authority empowered to permit water from the Edwards Aquifer, or until June 15, 1995, after the 1995 legislative session. Other provisions are:

- The owners will be required to meet all the water quality standards of all discharge permits governing the operation of the facility.
- In response, the cooperating agencies will withdraw their appeal of the Texas Natural Resources Conservation

Commission's decision to grant LWAS a discharge permit and an exemption from air quality standards. The agencies will also withdraw objections submitted to the U.S. Environmental Protection Agency on the issue of water quality.

- The owners of LWAS will pay the agencies the sum of \$400,000 to help defray the costs of pursuing this action. The amount will be divided proportionately among the agencies.
- The agencies will retain the right to present arguments and to be a part of any permit process in which a decision is made regarding how much water the operation can use. ■

News Briefs

□ The Edwards Underground Water District will be providing technical assistance and partial funding to the San Antonio Children's Museum for an *Edwards (Almost Underground) Aquifer* display. The Museum is scheduled to open in 1994 and will be located downtown. Children will have an opportunity to learn more about themselves and the world around them through hands-on exhibits, displays, and activities.

The proposed Edwards Aquifer exhibit will be a three-dimensional interactive model and simulation of the aquifer showing the physical relationship between the hill country (drainage area), the recharge zone, and the artesian portion of the system. Children will learn about the interrelationship of rainfall, aquifer levels, spring and river flows. The Edwards Aquifer model will be located in the Urban Ecology area. ■

□ Rachel Katz, a sophomore at Lee High School, has won first place in the Edwards Underground Water District's book cover design contest. The theme of the contest was "Be Water Tight."

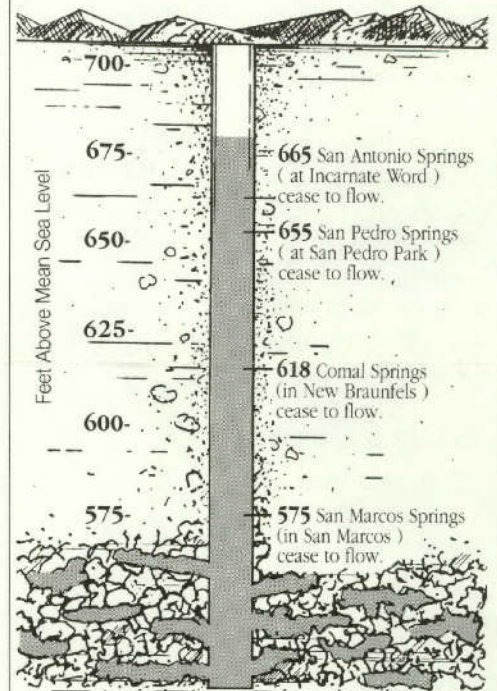
Katz's winning design, which creatively portrayed how important it is for people to "tighten up" on water usage, will be displayed on over 125,000 book covers provided free of charge by the District to high schools and middle schools in Bexar, Comal, Hays, Medina and Uvalde counties. Katz received a \$250 savings bond as first prize.

Second place was awarded to Victor Mendoza, a freshman at Edison High School, and third place went to sophomore Jose Hernandez, also from Edison High School. They received a \$100 and a \$50 savings bond respectively.

The bi-annual book cover design contest is open to all high schools in the five-county Edwards Aquifer region. ■

The Water Level

This reading reflects the daily high artesian water elevation at the Bexar County Edwards Aquifer Index Well.



Current Status: On December 29, 1993 the water elevation was recorded at 677.5. Average for December is 661.1.

THE WATER SOURCE

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