

EDWARDS UNDERGROUND WATER DISTRICT

DISTRICT OFFICE
1619 Tower Life Bldg.
San Antonio, Texas
CA 2-2871

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M. A. Rambie
Fred S. Mason, Jr.

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HAYS COUNTY:-

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OFFICERS

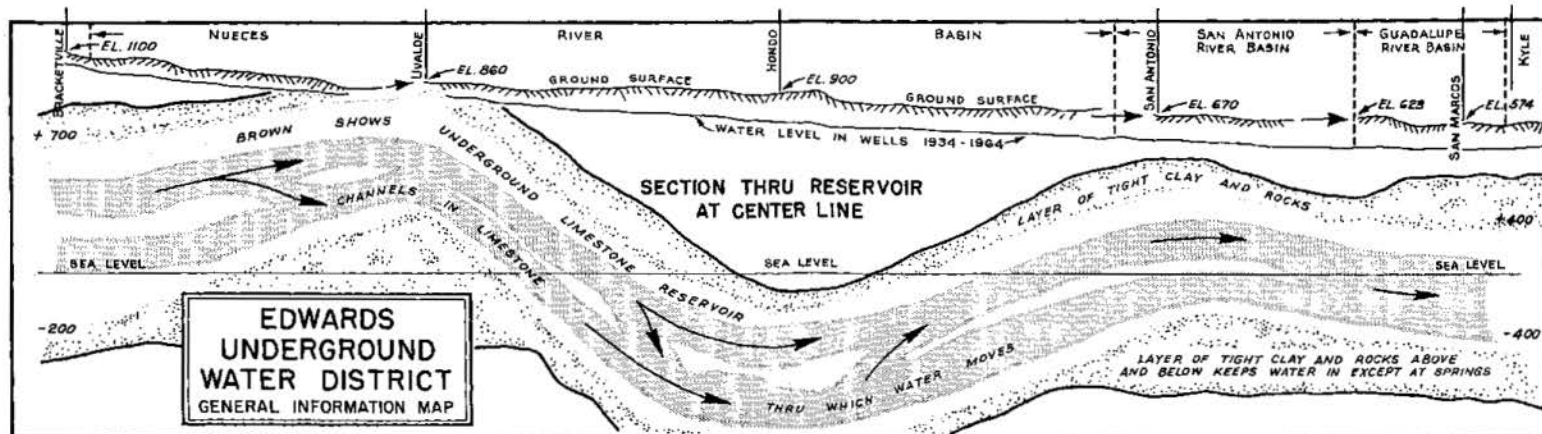
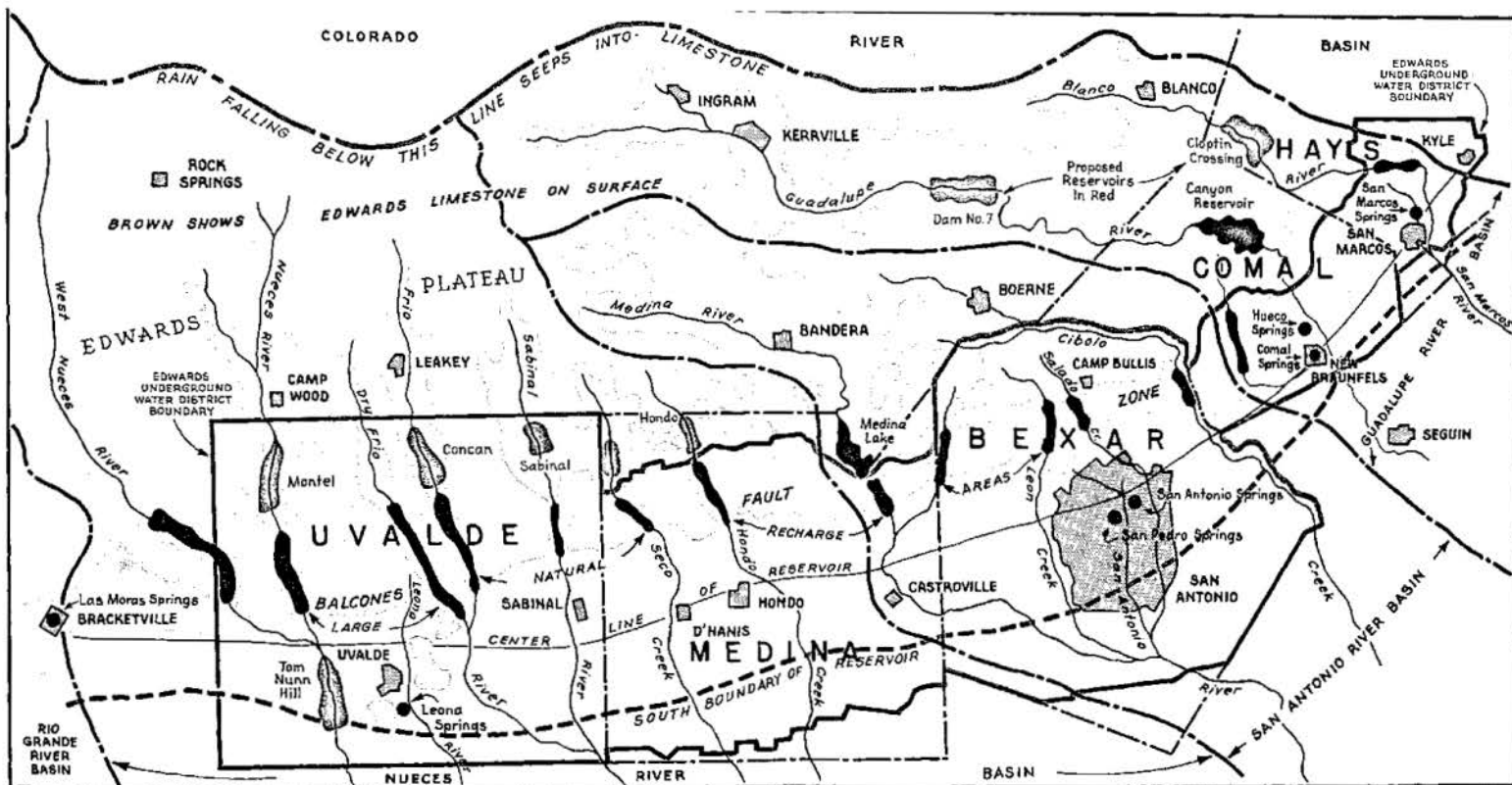
Chairman	Paul W. Jahn
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Secretary	William H. Spice, Jr.
Treasurer	Lawrence Rothe

OFFICE STAFF

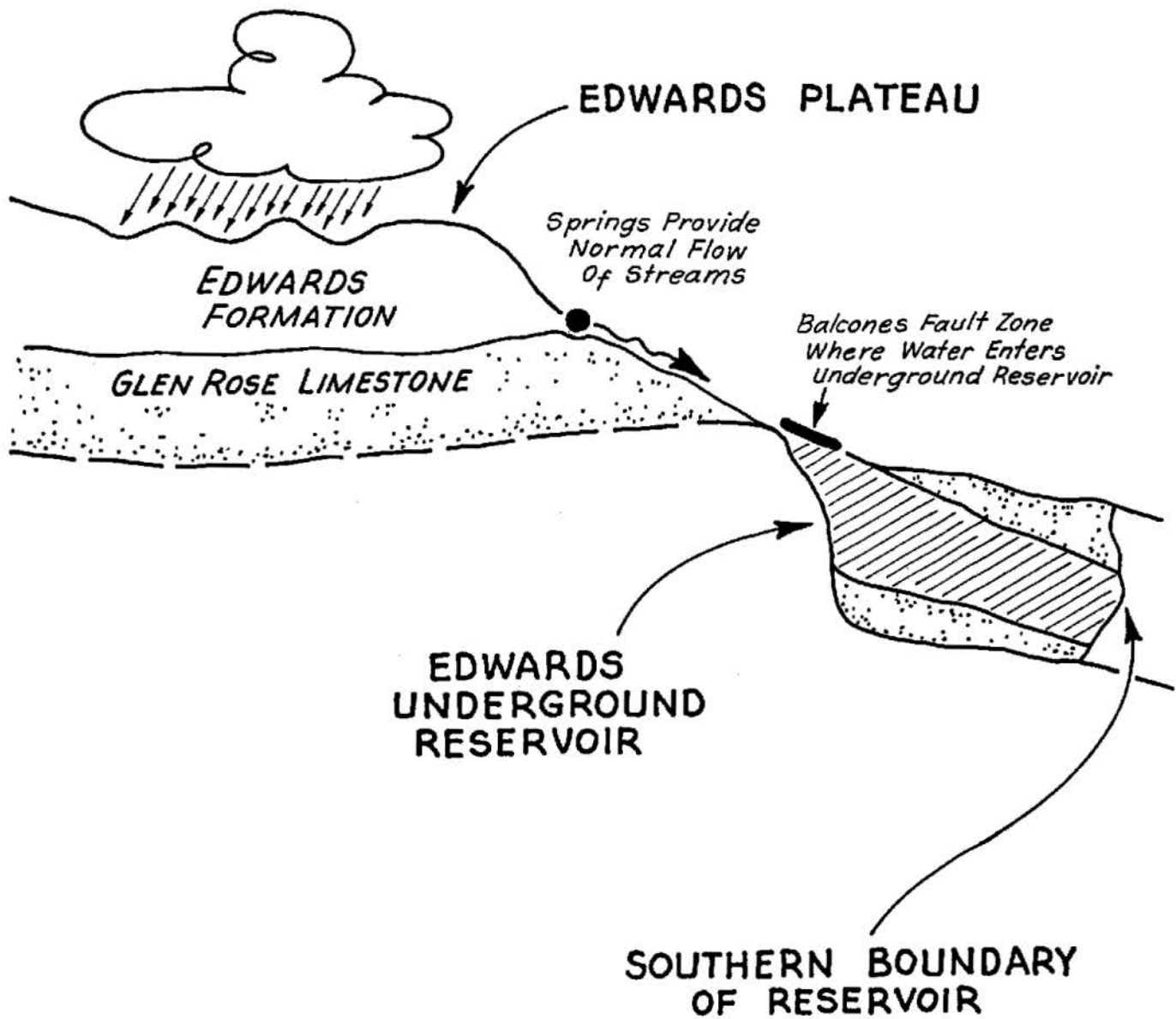
Engineer-Manager	McD. D. Weinert
Asst. Secretary	Jo Celia Cullinane

U.S. GEOLOGICAL SURVEY

Hydraulic Engineer	S. G. Garza
Engineer Technician	Paul Rettman
Engineer Technician	John Tomlinson



WATER MOVEMENT FROM NORTH TO SOUTH ACROSS THE AREA



THE RESERVOIR

The Edwards underground reservoir is a ground-water formation of vital importance to the San Antonio area from Del Rio east to Kyle. The part of this reservoir with which the Edwards Underground Water District is concerned extends across Uvalde, Medina, Bexar, Comal and Hays Counties; parts of this reservoir continue west of the city of Brackettville and northeast of the city of Kyle. The portion of the reservoir between Brackettville and Kyle is about 175 miles long and from 5 to 30 miles wide; the average thickness of the limestone which makes up the underground reservoir is 500 feet.

The recharge area of the reservoir, or the area where this ground-water bearing formation comes to the surface, is a strip (Balcones fault zone) of faulted and porous limestone where water goes underground into the reservoir. Southward-flowing streams that cross the Balcones fault zone lose a large part of their water to the underground reservoir, and rain falling directly on this faulted zone adds to the recharge. The streams that contribute most of the water drain that area of the Edwards Plateau below a line generally from the city of Rocksprings to the city of Blanco. The Edwards Plateau, the Balcones fault zone, the District area, and the southern boundary of the underground reservoir are shown on the general information map on page 2.

The major source of water comes from the western streams, such as the West Nueces, Nueces, Dry Frio, Frio, Sabinal and Medina Rivers, and the creeks in Uvalde and Medina Counties. The Guadalupe River is the only stream in the area which loses no water to the reservoir.

Annual flow of water into the reservoir from 1934 to 1959 has been as little as 44,000 acre-feet in 1956, and as much as 1,700,000 acre-feet in 1958. An acre foot of water is the amount of water to cover an area of one acre one foot deep, or approximately 326,000 gallons. The annual average recharge during this period was about 500,000 acre-feet. Usage from the reservoir in 1963 was 277,000 acre-feet.

The drought which ended in 1957 was the worst ever known in this area. Water levels in wells reached an all-time low. Medina Lake was dry. All springs except San Marcos Springs went dry. Rainfall was high from 1957 through 1961, and the reservoir recovered the losses brought about by the drought in a period of less than two years.

Water entering the reservoir moves slowly southward across the reservoir and then east and northeast toward the natural discharge points at Comal Springs at New Braunfels, and San Marcos Springs at San Marcos. Other "leaks" from the reservoir are the Leona River Springs near Uvalde, the San Antonio and San Pedro Springs in San Antonio, and the many wells that are allowed to flow (such as the Salado Creek well at Ft. Sam Houston in San Antonio.) Because ground formations through which water cannot "leak" lie above and below the limestone in the underground part of the reservoir, the water is under pressure and rises close to the surface in many wells and flows from others when they are drilled into the reservoir.

Water is pumped out by hundreds of wells from Brackettville to Kyle. The Reservoir is the only source of water for the cities of Uvalde, Knippa, Sabin, D'Hanis, Hondo, Castroville, LaCoste, San Antonio, New Braunfels, San Marcos, Kyle and other smaller communities. Irrigation, industrial, domestic, stock and other uses also are dependent on water from the reservoir.

1963 Discharge -- Acre-Feet Per Year

<u>Springs</u>	<u>Municipal & Industrial</u>	<u>Irrigation</u>	<u>Domestic Stock Ranchers, etc.</u>	<u>Total</u>
239,600	173,600	75,400	27,800	516,400

The discharge during 1963 was more than the average recharge because the reservoir water level was high enough to produce a large amount of springflow. Discharge and recharge vary considerably from year to year, but the long-term average discharge cannot exceed the long-term average recharge without drying up all springs and using up the water in storage below the level of the springs. In other words, only about one-half million acre-feet of water per year is available for long-term discharge through wells and springs under natural recharge conditions.

THE DISTRICT

The 1949-1956 drought alerted the people to the water problem and in 1959 the Texas Legislature created the Edwards Underground Water District for the purpose of protecting, conserving and recharging the underground reservoir.

The District consists of all of Uvalde County, most of Medina and Bexar Counties and a small part of Comal and Hays Counties, and covers about the same area the Texas Water Commission designated as the Edwards underground reservoir.

A fifteen member Board of Directors, three from each County Area, an Engineer-Manager and Assistant Secretary, with a central office in the Tower Life Building, San Antonio, Texas constitutes the business set-up of the District. A 2¢ tax per \$100 property valuation provides the funds for operation purposes.

An Engineer of the U. S. Geological Survey and two assistants occupy office space in the District office from which they carry on the continuing work of making studies of the amount of water that goes into and out of the reservoir, its movement through the reservoir, and the quality of the water.

Directors were elected in 1959, organized in January 1960, and in July of that year decided to spend no money on construction until an over-all study of what could be done had been made. Early in 1961 an agreement was made with the U. S. Army Corps of Engineers to make a study in cooperation with the District to see exactly what could be done to make more water available for use from the reservoir.

WHAT WE HAVE LEARNED TO DATE

Natural recharge puts most of the water which reaches the Balcones fault zone into the ground. Structures which add water to the reservoir without control over the time and/or amount, do not make more water available for use when the large springs are flowing. When water levels are high enough for springs to flow, such structures chiefly add to that flow. However, increase of the average annual recharge will make more water available for use after water levels have been lowered and springflow decreases.

The U. S. Army Corps of Engineers in cooperation with the District has completed a study of the recharge potential to the reservoir and finds that a system of reservoirs above the recharge areas on the streams west of Bexar County can increase the average annual recharge by a total of about 100,000 acre-feet. For example, the average annual recharge on the Nueces, Frio and Sabinal Rivers can be increased by a total of 68,200 acre-feet per year by construction of dams at Montell, Concan and Sabinal sites. The report recommends that surface water be used to supplement the underground supply, and that pumpage from the reservoir be no more than the amount that is available to recharge the reservoir in order that water levels will not be drawn down too far, risking the movement of poor quality water into the good water areas.

Additional surface water can be developed in the area above the recharge zone at Dam No. 7 on the Guadalupe River, and at the Cloptin Crossing site on the Blanco River just north of Wimberley. Both of these reservoirs are included in the master plan of the Guadalupe-Blanco River Authority. Areawide cooperative effort is essential if all available water supplies are to be fully utilized.

FUTURE PLANS

A short color-sound film entitled "The Edwards Story" has been produced and is available to any group wishing to view it. The film is educational and shows where and how the water enters the reservoir, movement through the ground, and all uses and discharges from the reservoir between Brackettville and Kyle.

We will see that all people in the District know the facts about the water problem of the entire area. The cooperative study with the U. S. Army Corps of Engineers will be explained to all residents of the area. After the state completes the outline of a comprehensive statewide water plan the District will be in a position to make recommendations for construction to the people of the area.

As a continuing part of our efforts to learn more about the water in the reservoir, movement through the reservoir and uses from it, we will continue the data gathering and evaluation program with the U. S. Geological Survey. Bulletins on water quality, recharge and discharge will be published each year.