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Developing the 1990 Texas Water Plan,
A Coordinated Circus

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Innovation in Western Water Law and Management

Natural Resource Law Center
University of Colorado School of Law
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Developing the 1990 Texas Water Plan,
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I. Introduction

A. Summary

A cast of over 4,500 units of Texas Government provide water service to its citizens. These governments include towns, cities, and special purpose districts created to provide the services. The State does not direct how these units of government provide these services except for setting public health standards and allocating surface water supplies. These "acts" are able to plan their show as they determine what is best for their clients. In 1988, the Texas Water Development Board began to revise its statewide water plan to include projections of demand, supplies to meet these demands, and facility costs and identification of water management policy alternatives. This "show" was "taken on the road" to obtain reactions of the local units of government. Eventually a revised water plan was adopted by the Water Development Board that generally represents a compromise among the competing interests.

B. Reference

Water for Texas, Today and Tomorrow, Texas Water Development Board, Document No. GP-5-1, December, 1990. For a copy, contact Planning Division, Texas Water Development Board, P.O. Box 13231, Austin, Texas, 79711-3231, Area Code (512) 463-8043.

II. Statutory Requirements

A. Surface Water Rights

The cast who provide service using surface water is using a State-owned resource, surface water. They obtain rights to use this resource by securing a permit from the Texas Water Commission. This right is to use a specified amount of water for a specified purpose at a specified place. Special provisions may be placed on the right, but generally rights for municipal and industrial uses do not expire. The rights could be canceled if the water is not put to beneficial use within 10 years. (Texas Water Code Chapter 11)

B. Ground Water Rights

Cast members who provide service using ground water are not using a State-owned resource. They obtain rights generally by owning the land surface as the right to capture ground water resides with the land owner. Some 35 areas of the state have created underground water conservation districts who can regulate ground-water use. The most common type of regulation is well spacing although the Houston area is covered by the Harris Galveston Coastal Subsidence District which issues well-specific pumpage permits and is requiring cities to switch to surface water supplies. (Texas Water Code Chapter 52)

C. State Water Plan

The Ringmaster of the circus is the Texas Water Development Board who is directed to maintain a current and comprehensive state water plan. This plan is to encourage the orderly development and management of water resources of Texas in order that sufficient

water is available at a reasonable cost to further the economic development of the entire state. The plan must protect a basin's projected needs for the next 50 years before water is proposed to be exported to another basin. A public hearing is required on each amendment of the plan. (Texas Water Code Chapter 16)

D. State Financing of Facilities

The Texas Water Development Board provides loans to water service providers for needed water facilities. These facilities include new reservoirs, well fields, pipelines, treatment plants, and distribution systems. The funds are obtained by selling State of Texas General Obligation Bonds on the open market. Thus State of Texas credit is used to provide funds at a rate that is lower than the individual supplier can obtain. The Board may purchase up to one-half of a project to encourage its completion to optimum size and to serve as a regional facility.

III. Water Supply Characteristics

A. Water Use

The water supply cast has provided adequate supplies to Texans who use about 12.4 million acre-feet of water. Twenty-two percent is used for municipal supply, 13 percent for manufacturing and power generation, and 62 for irrigation. Mining and livestock account for the remaining 3 percent.

B. Ground Water

Most of the water (6.4 million acre-feet) is supplied by ground water with 70 percent of ground water used going for irrigation. About 45 percent of the water used for municipal

purposes is supplied from ground water. About 80 percent of the state is underlain by a major or minor aquifer and these receive over 5.3 million acre-feet of dependable recharge annually.

C. Surface Water

Texas' 23 river basins have 3,700 streams and 80,000 linear miles of streambed. Many streams flow to major bays and estuaries of the Gulf of Mexico. Average annual runoff is 49 million acre-feet which is controlled by 188 major reservoirs. These facilities have a firm annual yield of 11 million acre-feet which is twice the current amount of diversions, 6 million acre-feet. However, 83 percent of the unused capacity is dedicated to specific customers. Forty-four percent of surface water use is for irrigation with 28 percent used by municipalities and 24 percent used for manufacturing and power generation.

IV. Water Demands

A. Texas Economy Changes

In 1988, the Water Development Board, the ringmaster, decided to revise the most recent plan which was adopted in 1984. This new plan would involve the development of a revised projection of what Texas would look like 50 years from now. Since the adoption of the 1984 Plan, Texas' economy had changed. The rapid expansion of the early 1980's ended with a downturn. The oil industry, largely due to international events, had a decline which was followed by a decline in the other sectors including agriculture. Between 1980 and 1982, the population of Texas grew by 761,000 persons while the two-year period beginning in 1984 saw

a growth of only 229,000 persons. By 1987, the economy of Texas began to recover and these economic changes resulted in the need to revise the 1984 Plan.

B. Demand Projections

i. Summary

A key component in water planning is projecting future population. Our projection was that Texas' population would increase to 35.6 million, a doubling of current population by 2040. These additional people would use more water at home and at work. Using historical per capita use rates, municipal water use would equal over 7.6 million acre-feet by 2040. If water conservation practices were implemented that would reduce per capita use by 15 percent, the 2040 use would be reduced to 6.4 million acre-feet. Manufacturing and power use was projected to increase to 4.5 million acre-feet. Irrigation is projected to decrease to 6.7 million acre-feet, primarily due to improved efficiencies.

ii. Initial Coordination

As the first step in the process, the ringmaster (Water Development Board) involved local regional council of government to distribute the projections for comments by the acts (local water service providers). This was the first step in the coordination. The councils distributed the information and Board staff attended 24 meetings around the state to hear from locals on problems with the projections and ideas for change. Based on the comments received, the projections were modified as needed.

V. Water Supplies

A. Allocation of Supplies to Needs

The basic step in the allocation is to match projected demands by utility to supplies committed to the utility. In some cases, the supply is sufficient to meet the 50-year needs. In others, the supply is insufficient to meet the demands. If committed supplies are not sufficient, locally available ground water and projected municipal and industrial reuse and return flows were evaluated. If none of these supplied the needed water, additional supplies from other entities and new reservoirs were identified. The allocation showed that new sources of supply were needed.

B. Reuse and Return Flows

Direct use of water from wastewater treatment plants, reuse, should increase. The amount are projected to increase 300 percent to over 500,000 acre-feet per year. Use of wastewater effluent after it has been discharged to a stream, return flows, is projected to increase over 30 percent.

C. New Supplies

i. Summary

Use of water from new sources, primarily reservoirs, would increase within the 50-year period. Over 1.3 million acre-feet of water in 2040, 7 percent of total use, would come from the construction of 14 new reservoirs and 9 other projects; chloride control projects and reallocation of storage in existing reservoirs. Some projects are needed now and others will not be needed for another 50 years.

ii. Coordination of Competing Views

In July, the Board released a draft report that included the listing of new projects. Over 1,300 copies of this draft were distributed as were 1,300 copies of a revised draft released in November. Many competing views began to emerge. The conditions would be similar to a multi-ring circus in that more than one act is attempting to attract the crowd's attention. In one ring, the view was that the plan should not list specific projects as the local entities may chose to follow another project and its absence from "The Plan" would be held against the project during permit proceedings. In another ring, the view was that the projections were too high and no new projects would be needed if water was used more efficiently. In yet another ring, the view expressed was that building new lakes just to meet needs, as we had proposed, did not allow for uncertainties and did not encourage additional economic development because of questionable water supplies. In a fourth ring, view was that imposing water conservation techniques was harmfully since it forced a change in lifestyles without sufficient reason. The view was expressed as if it was possible to provide all the water people were willing to pay for, it was the job of the utility to satisfy that need.

In juggling these competing views, the Board determined that the show would have two rings operating. One involves the implementing water conservation techniques (reducing per capita water use 15 percent by 2020) and identifying only those new projects necessary to meet the demand. The second ring includes

those projects which would be necessary if our projections are too low or if water conservation practices are not successful in reducing water use.

VI. Facility Needs

A. Utility Information

Major utilities around the state were contacted to obtain their capital improvement plans. For 200 other cities, staff visited city officials as part of an ongoing technical assistance program to determine status of their facilities and assist them in planning for future improvements. For others, estimates were made by comparing demands and facilities using data in state data banks.

B. Water Supply

Facilities needed for water supply include facilities for new reservoirs, wells, water treatment, storage, pumping, and transmission. With reductions in water use resulting from water conserving practices, cost of new reservoirs and cross-country conveyance lines would be \$4.8 billion and \$12.8 billion for other water supply facilities. The values for the condition without water conservation improvements total \$6.4 for new reservoirs and conveyances and \$13.2 for other facilities. Water conservation would reduce long-term costs for water supply facilities by almost \$2 billion over the 50-year period.

C. Wastewater

Facilities needed for wastewater service includes treatment, pumping, and collecting wastewater. If water conservation savings are achieved, the cost of new wastewater

facilities is \$37.1 billion. Without conservation, the total is \$40.6 billion, thus water conservation could reduce wastewater infrastructure cost by \$3.4 billion by the year 2040.

D. Flood Protection

The US Army Corps of Engineers estimated the cost of all flood protection projects that had been studied by the Federal government which had a benefit cost ratio of greater than one or by State-sponsored studies. The total cost of these projects was \$1.9 billion. This cost does not represent the totality of the need as only studied projects were included. A large amount of other needs have yet to be determined.

E. Other Needs

Many new programs will increase the cost of facilities for utilities. These include new requirements under the Safe Drinking Water Act, urban stormwater runoff and other non-point source pollution, solid waste, stricter wastewater treatment standards, and rehabilitation of existing facilities.

F. Summary

The total water and wastewater facility needs for the State for the next 50 years is estimated to be between \$37 and \$40.5 billion. Of this amount, over 50 percent of the total is for wastewater facilities. New reservoirs account for only 12 percent of the total.

VII. Policy Issues

A. Conservation

Water conservation is a major issue for Texas. The

Legislature has determined that the Water Development Board and Water Commission will stress water conservation. For this set of acts, three rings appear to be competing for the crowds attention. One act is striving to implement water conserving practices to obtain reasonable results (El Paso and Corpus Christi are two such cities) due to acute problems. Another ring contends that numerical goals must be established and that a doubling to 30 percent reduction is needed. The third ring believes that as long as customers desire a level of service, it is the job of the utility to provide that service. As the ringmaster, the Board determined that the best policy was to encourage implementation of water conservation techniques that would not reduce "standard of living", yet would result in increased water efficiency.

B. New Water Sources

For this set, three rings appeared. One view was that new reservoirs should be constructed as soon as possible to ensure a long-term water supply. In the future, it will be more difficult and expensive to construct the facilities and building them now will reduce the cost to future customers. The second ring would use all available sources and provide additional water supply as needed, using the least costly alternative at that time. The third ring would use all existing sources, drastic conservation, reuse, and desalting to meet demand and perhaps allow demands to not be met. Again as ringmaster, the Board chose the second idea, realizing that new reservoirs often need many years to implement.

C. Cancellation of Water Rights

Water rights are subject to cancellation if they are not used for ten consecutive years. For this set, two rings were apparent. One was to remove the cancellation threat for municipal systems. Their view was that cities must develop reservoirs in advance of need and telling a city that it could lose its investment, not to mention its "water", would cause great damage to the future development of cities. The other view was that it would be better to allow this state resource, surface water, to be used as inexpensively by the people. Forcing a city to build a new project when a nearby one is not being used causes greater expense on the city that must develop the new resource. As ringmaster, the Board supported the cancellation procedure, but suggested that the investment of a city must be protected and the prospects of a building a new reservoir should be improved before a city is forced to sell water to another entity.

D. Ground Water

There is an ongoing debate in Texas on the need for additional control over ground-water pumpage. This set of the circus has two rings: one with more controls and another supporting current controls. In ring one are supporters of increased state oversight of local districts and state solution to critical problems where locals have not adequately addressed the problem. The second ring includes the current ground-water conservation districts and those who oppose land-owners rights being reduced by more regulation. The Board chose a middle ground with state control in areas where locals will not address the problems and

additional state assistance to local districts for data and planning.

E. Environment

The has always been completion between "dam builders" and the "environmentalists" and often these two could not even be in rings side-by-side. On this topic, the Board recommended increased information gathering on the environment and included expected releases for environmental reasons from new projects when the water supply allocation analyses were made and considered mitigation expenses when determining the cost of new projects.

VIII. Conclusion

The 1990 Texas Water Plan was a result of coordinated work with many individuals and units of government. Most utilities were contacted many times for data and for comments on the contents of the plan. Almost 30 public meeting were held around Texas to obtain public comments with almost 575 persons attending with over 360 comments received. The result is a document that identifies how water resources could be developed for the future and provides decision makers information on the management issues important to Texas.