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Districts Make a Difference

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Even though there are no major rivers and less than 18 inches of annual rainfall on the High Plains of Texas, it is one of the most important agricultural areas in the world.

An underground reservoir called the Ogallala Aquifer supplies all the water necessary to irrigate thousands of square miles of corn, grain sorghum, and wheat.

This reservoir beneath the High Plains holds 45 percent of all ground water in Texas--280 million acre-feet of recoverable, good quality water. That is twice the capacity of all existing and proposed surface reservoirs in Texas.

Water from the underground reservoir, however, is not as abundant nor as available as it once was. A nagging problem for the High Plains has been that there is less water each year than the year before. The water level near Plainview, for instance, dropped from 70 feet below the surface in 1956 to 110 feet below the surface in 1974.

Less water means deeper wells and higher pumping costs. Less water also means once prolific wells declining in production, and many drying up completely.

Water in the underground reservoir has accumulated from millions of years of High Plains rain and snow seeping very slowly down to the Ogallala's "red bed"--a layer of impermeable rock. This water has remained trapped in porous sand and rock simply because it has nowhere else to go. The Canadian River valley dissects the formation on the north; the Pecos River seals it in the west and south; and the Cap Rock escarpment exposes it on the East. These same geological features also prevent ground water from flowing into the isolated Ogallala.

The only method of recharging the aquifer, then is the slow percolation of water through the soil. Since most of the soils in the High Plains are not very porous, this recharge

averages less than an inch a year, yet the water is pumped out at an average of two-and-one half feet a year.

It became obvious to many living in the High Plains as early as 1940 that the water table of the ground water formation was being lowered by irrigation pumpage, that waste was occurring, that competition between closely-spaced wells was reducing their efficiency, and that the water was being mined because withdrawals greatly exceeded the recharge.

The water level decline is not uniform throughout the area. In some places where the red bed is close to the surface and the Ogallala therefore thin, adequate water for irrigation has been exhausted. Other regions where the formation is thicker will have water available to irrigators for another ten, twenty, perhaps in certain especially fortunate areas, even fifty, years at the present rate of depletion.

Private Ownership

Texas law gives each land owner freedom to withdraw and use ground water from beneath his land without restriction. The private ownership of water, in fact, is guaranteed in the state constitution and has been upheld in court since 1904. At that time the Texas Supreme Court declared that "A person who owns the surface may dig therein and apply all that is found to his own purpose " This applies to oil and gas as well as water.

Other decisions have confirmed that under Texas law a landowner has the right to drill wells and appropriate all of the underground waters without regard to the effect on other landowners.

The state legislature reaffirmed this private ownership right in 1949 and again in 1971 even as it created local option underground water conservation districts and granted them the authority "to promulgate and enforce rules... to provide for conserving, preserving, protecting, recharging, and preventing waste of the underground water..."

Conservation Districts

Ground water conservation districts can be created anywhere in the state where there is a definable underground reservoir and approval of voters. Six districts have been created in the High Plains, but only three are operational: the High Plains Underground Water Conservation District No. 1 in Lubbock, created in 1951; the North Plains Ground Water Conservation District No. 2 in Dumas, created in 1954; and the Panhandle Ground Water Conservation District No. 3 in White Deer, created in 1955.

Two other districts dealing with ground water are in operation in Texas: the Edwards Underground Water District in San Antonio and the Harris-Galveston Subsidence District in Houston. Both of these districts were created by special legislative acts rather than by local elections.

Even though other districts have many of the same responsibilities and powers as the districts on the High Plains, there are major differences. All underground water districts tread a narrow path between the private ownership rights of underground water and the districts' responsibility to protect the natural resource, but nowhere in the state is this more pronounced than on the dry, rugged High Plains.

District Authority

High Plains districts have the authority to limit annual production of wells, but they have never used it. They have attempted recently to limit production of wells in gallons per minute capability. Most districts have directed their efforts toward prevention of waste, recharge work, education on the need for conservation, and collection of data on the declining water table levels.

Underground water conservation districts are specifically prohibited from buying, selling, or transporting water.

No appellate court decision has dealt specifically with the constitutionality of High Plains underground water conservation districts; but district courts in several counties have upheld the districts' well spacing authority.

The Texas Supreme Court did rule in favor of the Harris-Galveston Coastal Subsidence District in March of this year. The authority of river authorities and other types of water districts also has been upheld in numerous court decisions.

District Weaknesses

Almost thirty years after the ground water district law was passed, a comprehensive program of water conservation has yet to emerge on the Texas High Plains. One reason for this is because district boundaries are determined by local option elections rather than on geological formations. Many important areas of the aquifer are not included in conservation districts. One of the most heavily irrigated counties, for instance, is Swisher County which voted not to be a part of the High Plains Underground Water Conservation District.

The effectiveness of ground water conservation districts has been further hindered by the emphasis upon voluntary compliance rather than upon enforcement of regulations. Districts have been hesitant to use the powers of enforcement given them by the state legislature.

During the 1960's, the drastic decline of ground water levels for many areas forced ground water districts into serious water conservation measures. The districts began stiffer enforcement of rules and regulations governing well spacing and water wastage as well as continuing the earlier emphasis on education.

A bulletin distributed by one of the water conservation districts on the High Plains states: "Ground water conservation is everybody's job; it is everybody's future."

Few would argue that the future of the Texas High Plains depends upon current extractions from the underground supply of water. As to "everybody's job"--well, that is why conservation districts were established. If they fulfill their responsibility to educate "everybody" on the hows and whys of water conservation it could mean many added years to the usefulness to the Ogallala.

A Closer Look

The High Plains Underground Water Conservation District No. 1 is the largest and most active underground water conservation district in the state. It consists of all or parts of 15 counties totaling more than 8,149 square miles.

Operations are financed by a tax rate of $.05 on $100.00 state and county valuations which means irrigated land pays about $10.00 per section and a $25,000 home pays about $5.00. These taxes are assessed and collected by the county tax assessor.

Eighty elected officials are involved in establishing policies and practices of the District. They include five directors on the District Board and five committee members in each county. County offices are maintained in ten counties to receive applications for well permits, well permit deposits, well logs, and well completion reports.

The District headquarters in Lubbock houses 15 employees including a general manager, several engineers, and specialists in such fields as agriculture, geology, and economics.

Major programs currently underway at the District include observation well data collection, well drilling permits and records, reuse and recharge studies, water quality monitoring, economic studies, and geohydrologic evaluations.

District personnel annually measure the water level depth in about 800 wells located throughout the District. Information gained from the observation well program is used to analyze changes in the volume of water stored in the aquifer. This data is added to a system of continuous records begun by the U.S. Geological Survey in the early 1930's.

The district also maintains records on every well in the area capable of pumping more than 100,000 gallons per day and requires a permit to drill a new well capable of pumping over that amount. Permits are granted only when the well is spaced an appropriate distance from existing wells.

Depletion Allowance

Water level records obtained through the observation well program constitute the foundation for the District's cost-in-water depletion allowance program.

A 15 percent depletion allowance is granted by the Internal Revenue Service to landowners whose ground water level is declining. The depletion allowance is based on information supplied by the District concerning (1) thickness of the Ogallala aquifer under the land at the time of purchase; (2) average annual decline in the water table; and (3) the part of the original price for the land which represented the investment in ground water resources.

About 7,500 landowners in the District now claim this tax allowance for an annual savings to this group of between three to five million dollars.

Water Reuse Systems

Another important role of the High Plains District has been that of experimenting with water reuse systems. In the past much water was wasted by allowing tailwater to flow out the ends of field rows and into drainage ditches. Officials of the District installed water meters in public ditches of several counties in 1962 which gathered information indicating that an average irrigation system wasted about one hundred gallons per minute in runoff.

A program to combat this loss was begun by the District and farmers in Parmer County. They experimented with tailwater return systems which collected runoff and pumped it back into irrigation ditches. These systems which also collect some rain water, have proven effective and can conserve as much as 22 percent of the total amount of water from an irrigator's wells, according to District personnel. Similar tailwater systems are now in use throughout the Great Plains and in many western states.

The District has also sought more efficient ways to use runoff collected in playa lakes. Playa lakes are shallow depressions found in the Texas High Plains which collect rain or irrigation runoff, but lose most of it through evaporation.

Wayne Wyatt, manager of the District, believes that the effectiveness of the District's programs and activities should be credited to the people of the area and their willingness to make rapid changes to improve the efficiency of their operations. Wyatt feels that the 80 elected officials who govern the District's activities have been very instrumental in keeping District management current and up-to-date on the ever-changing conditions in the area.

"In the early days," according to Wyatt, "people believed that the ground water in the Ogallala was replenished on an annual basis from snow melt in the Rocky Mountains, and High Plains irrigators saw no need to conserve and utilize their ground water efficiently. This mistaken concept has been corrected by the District's geohydrologic mapping work which has been made available to the people in the District. We believe that the majority of the people served by the District now have a reasonably good understanding of the aquifer and its characteristics and that most understand they are mining their ground water and must use it to maximum benefit."