

Research Report

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Solving the Texas Water Puzzle: Market-Based Allocation of Water

by
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EXECUTIVE SUMMARY

Texas has reached a crossroads in the management of water resources. While the state's population continues to grow and the municipal water demand is increasing, Texas' surface and groundwater supplies are limited or allocated to other uses. The era of cheap and abundant water is over and new ways to provide this critical resource to Texans must be found.

Water marketing and transfers are a viable and cost-effective way to supply water to growing Texas cities and industries. Transfers also promote efficient water use and can supply water for environmental and recreation uses. Marketing is particularly suited for satisfying these new demands because it encourages voluntary transfers while protecting, promoting and enhancing private property rights.

Water marketing and transfers are occurring under the current legal framework. Although major reforms are not suggested, the following improvements are needed to further foster water marketing and transfers, protect private property rights, improve groundwater management related to markets, and to encourage private investments in water development:

- Amend the Texas Water Code to indicate that voluntary transfers of surface and groundwater through marketing are the state's preferred method for reallocating water.
- Exempt small-scale transfers of less than 3,000 acre-feet per year from the no injury and contested case hearing rule if the Texas Commission on Environmental Quality (TCEQ) finds that they have a *de minimus* impact on downstream users.
- Explicitly authorize a transfer of the entire amount, or any portion, of a water right without a contested case hearing if the TCEQ finds that the transfer does not cause an unreasonable adverse impact on other water rights holders, or on the environment.
- Modify the "no injury rule" or "adverse impact rule" to a "no unreasonable or adverse injury."
- Establish legislative guidance for the TCEQ in determining "unreasonable adverse injury."
- Remove the junior rights rule on interbasin transfers from Texas surface water law.
- Remove the restrictions that groundwater conservation districts can impose on the free market transfer of water and establish "unreasonable, permanent harm to an aquifer" as the only basis for restricting groundwater transfer.
- Eliminate export fees on water transported outside the district. However, if export fees are justified on the basis they can mitigate negative community impacts from the exportation of water, the amount of the fee must be small enough not to discourage transfers and it must be universally applied. Further, collected fees should be dedicated for use in a water infrastructure fund and not be used to offset the groundwater district's operational costs.
- Undertake a legislative analysis of groundwater district law to determine if and how districts impact local and regional economies.
- Require groundwater conservation districts to analyze the economic impact of

pumping regulations on private property rights and the local/regional economy, if the Texas legislature intended that economics be a factor in groundwater conservation district regulations.

- Improve the rule of capture by (a) extending protection only to pre-existing domestic wells producing less than 25,000 gallons per day from high-capacity wells capable of producing more than 25,000 gallons per day; and (b) adopting specific criteria that the parties and courts could use to determine if there was unreasonable harm caused by non-domestic, high-capacity wells.
- Remove barriers to developing public-private partnerships in which the private sector makes substantial investments in a project, and allow state financial assistance to be made available to public-private partnerships involved in water conveyance and distribution projects.
- Initiate a legislative study of the feasibility of adopting the “common carrier” concept in authorizing the construction of new water pipelines and conveyance systems, and the feasibility of using common carrier concepts for existing transportation and conveyances.

ABOUT THE AUTHOR

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Kaiser’s research focuses on water rights, water marketing, environmental flows and groundwater management. A number of his recommendations on water marketing have been incorporated into Texas surface water law. He has published a number of journal articles on water marketing that can be obtained in a PDF format at <http://texaswater.tamu.edu>

Disclaimer:

The views expressed in this paper are solely those of the author and not of Texas A&M University.

INTRODUCTION

Texas has reached a crossroads in the management of its water resources. While the state's population continues to grow and the municipal water demand is increasing, Texas' surface and groundwater supplies are limited or allocated to other uses. The era of cheap and abundant water is over and new ways to provide this critical resource to Texans must be found.¹

The traditional approach of building more reservoirs to satisfy demand is limited by economic, environmental, fiscal, political and physical constraints. Water experts and citizens alike suggest that Texas needs to use a variety of means to provide water for this new demand; indeed, the state has been transitioning from a practice of building more reservoirs to demand management through water transfers, conservation, reuse and improved management of existing surface and groundwater resources, as a way to increase water availability.²

Emphasis on water supply management through reallocation is being implemented through changes in law and practice that focus on:

- water marketing and transfers;
- groundwater management; and
- increasing the private sector's role in supplying water.

Conflicts associated with this new water reality are to be expected as the state transitions to an urban and service-oriented economy. The importance and political urgency of these conflicts varies from region to region and among different water groups within a region. For example, groundwater "mining" is an issue in the Texas Panhandle but it is not a concern in East Texas. The plan to build the Marvin Nichols Reservoirs to provide water for Dallas is illustrative of an intra-regional conflict engendering support and fierce opposition between interest groups in Dallas and East Texas.

Some water marketing and transfers will continue under the current regulatory regime — no major overhaul is necessary — but the reforms suggested in this paper are needed to facilitate a broader redistribution of water through marketing and an increased involvement of the private sector. In order to better understand these reform proposals, this paper provides a brief overview of Texas water resources and Texas water laws and regulatory burdens that affect these transfers.

TEXAS' WATER RESOURCES

Climate controls the water resources of Texas. Except for certain non-recharging aquifers, rainfall dictates the availability of the state's surface and groundwater resources. Rainfall amounts vary widely across the state, ranging from an average of nearly 60 inches annually in the Piney Woods of East Texas to less than 4 inches per year in the Trans-Pecos region in Far West Texas. These variations, in turn, directly affect rivers, reservoirs and rechargeable aquifers.

Groundwater

Nine major aquifers supply about 97 percent of the groundwater used in Texas. The other 3 percent is drawn from 20 minor aquifers.³ Texas aquifers are like droughts; no two are exactly alike. Some aquifers are very rechargeable and can store large volumes of water, while others have little recharge and have limited storage; still others have little recharge but store a large volume of water.

The Ogallala, for example, is a huge aquifer underlying most of the Texas Panhandle; it holds water deposited during the Ice Age. This aquifer supplies two-thirds (66 percent) of all the groundwater and more than one-third (38 percent) of all the water used in Texas (see Figure 3). Due to limited rainfall and the geology overlying the Ogallala, the Texas portion of the aquifer receives very little natural recharge. In contrast, the Edwards Aquifer, located in and around San Antonio, is a highly rechargeable aquifer; it is subject to rapid draw downs but it can be quickly replenished by rainfall. Each aquifer is unique and that any management plans should be structured to provide sustainable yields, or optimal production for the aquifer in question.

Table 1 illustrates the annual pumping and recharge rates for Texas' nine major aquifers. Information in this table illustrates that some aquifers are being "mined", meaning more water is being pumped from the aquifer than will be replaced by the natural recharge process. The mining of aquifers has long-term economic, environmental and social implications for the regions served by the aquifers. These implications must be reflected in aquifer management practices.

**TABLE 1:
Water Extraction and Recharge Rates from Nine Major Aquifers in Texas**

	1996 Estimated Pumping (Million Acre-Feet)	1996 Estimated Recharge (Million Acre-Feet)
Ogallala	6.22	0.30
Edwards (Balcones)	0.47	0.44
Edwards-Trinity	0.25	0.78
Carrizo-Wilcox	0.49	0.64
Trinity	0.19	0.10
Gulf coast	1.15	1.23
<u>Bolsons</u>	<u>0.39</u>	<u>0.43</u>
TOTAL	9.16	3.92

Source: Mary Sanger and Cyrus Reed. 2000. Texas Environmental Almanac 2nd Edition
(Texas Center for Policy Studies, Austin: University of Texas Press and Texas Water Development Board,
1995 Estimated Groundwater Pumpage Summary by Major Aquifers Units (1997).

Groundwater provides about 60 percent of the estimated 16.5 million acre-feet of water used in Texas; rivers and reservoirs providing the rest. About 80 percent of the state’s groundwater is used for agricultural irrigation — mostly in the Texas Panhandle, the Lower Rio Grande Valley and areas around San Antonio. Groundwater is also an important source of water for many cities; about 20 percent of total groundwater use is for cities and industry. Most of the arid western part of the state and a significant part of East Texas rely on groundwater for municipal and manufacturing uses (see Figure 1).

Surface Water

Rainfall directly impacts surface water resources of the state. Water runs off the land through some 191,000 miles of creeks, streams and rivers in the 15 major river basins and eight coastal basins in the state. Because of different rainfall and geological patterns, the amount of surface water produced varies among the basins. East Texas rivers and their watersheds receive the greatest amount of rainfall averaging between 35 inches and 50 inches per year.⁴ Not surprisingly, many of the major reservoirs of Texas are located on these rivers. Central Texas rivers — including the Brazos, Colorado Guadalupe and Lavaca/Navidad — traverse a drier part of the state; rainfall in these watershed averages 15 inches to 35 inches per year. Rivers of the Texas Panhandle, of Deep South and Far West Texas flow through some of the driest parts of the state, with rainfall averaging 4 inches to 25 inches per year.⁵ Reduced rainfall and higher evaporation rates in portions of Texas west of a line from San Antonio to Wichita Falls make reservoir development less certain and less reliable.

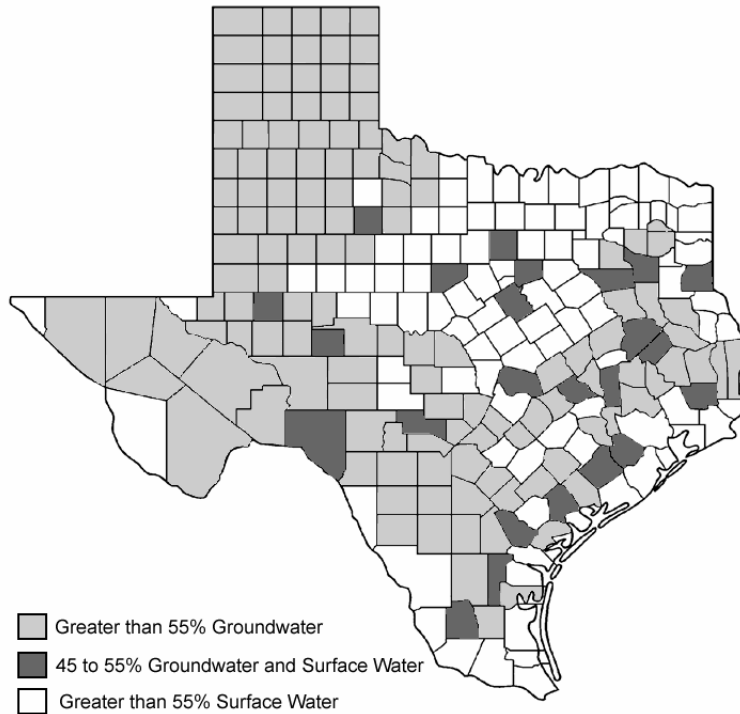
Surface water supplies represent the amount of water that can be currently used from rivers and reservoirs. On average nearly 50 million-acre feet of water runs off Texas lands and flows down our state’s waterways each year. An estimated 6,700 ponds, tanks and reservoirs have been constructed in Texas to capture and hold some of this runoff. However, most of the water is stored in just 211 major reservoirs located in the central or

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eastern portions of the state. These major reservoirs contain approximately 14.9 million acre-feet of firm dependable yield (amount of water stored during a major drought); however, these reservoirs have the capacity to store up to 41.5 million acre-feet of water under wet conditions.⁶ Interestingly, about half (49 percent) of this dependable yield is held in reservoirs in just three rivers — Trinity, Neches and Sabine.⁷ Although the dependable yield of Texas' reservoirs is 14.9 million acre-feet per year, only 6.6 million acre-feet was used in 2000 (see Figure 2).

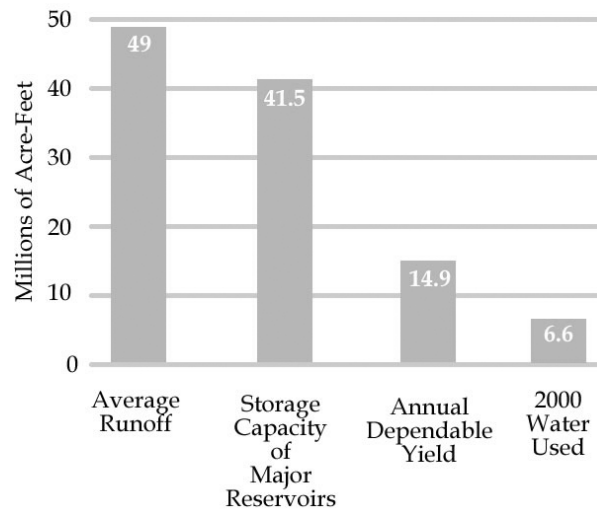
Most of Texas' surface water — about 65 percent — is used by cities and industry (see Figure 3). The remaining 35 percent is used for irrigation, steam-electric power generation, mining, and livestock production. Most of the north central part of Texas, the Gulf Coast areas and the Lower Rio Grande Valley rely primarily on surface water resources (see Figure 1). Except for San Antonio, a number of larger cities are converting to surface water or mixing groundwater with surface water. For example, Houston and many communities in Harris and Fort Bend counties are gradually switching from ground to surface water to minimize subsidence problems.

FIGURE 1: Surface and Groundwater Use by County in 1999



Source: Texas Water Development Board, *Water for Texas—2002*, (TWDB, Austin, Texas) p. 39.

FIGURE 2: Surface Water Storage, Supply and Use in 2000

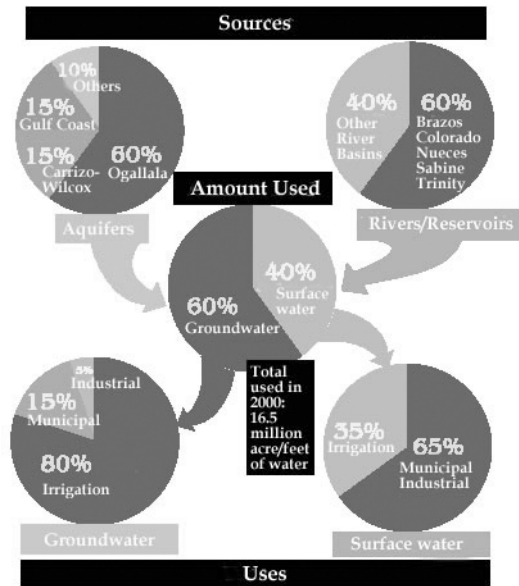


Source: Texas Water Development Board, *Water for Texas—2002*, (TWDB, Austin, Texas).

TEXAS' WATER USES

Although the amount varies from year to year because of rain and drought conditions, Texans use about 16.5 million acre-feet of water annually.⁸ The 2002 State Water Plan lists six major categories of water use: (1) irrigation; (2) municipal; (3) manufacturing; (4) steam-electric power generation; (5) livestock; and (6) mining. Three categories — agricultural irrigation, municipal and manufacturing activities — account for 95 percent of all water used in Texas. Water demands are projected to increase (in all categories except irrigation and mining) during the next 25 to 50 years.

FIGURE 3: Texas Water Sources and Uses



Source: B. Lesikar, R. Kaiser & V. Silvy, *Questions about Groundwater Conservation Districts in Texas*, Texas Cooperative Extension, Publication B-6120, 06-02, available online at <http://texaswater@tamu.edu>

Irrigation Use

Statewide, irrigated agriculture is the largest single consumer of water. Nearly 10 million acre-feet of water, or about 60 percent of all water used in Texas, is used to irrigate nearly 7 million acres of land and at least 12 different types of crops. Five crops comprise about three-quarters of the irrigated acreage in Texas: cotton (32 percent); wheat (15 percent); corn (15 percent); sorghum (9 percent); and rice (5 percent).⁹

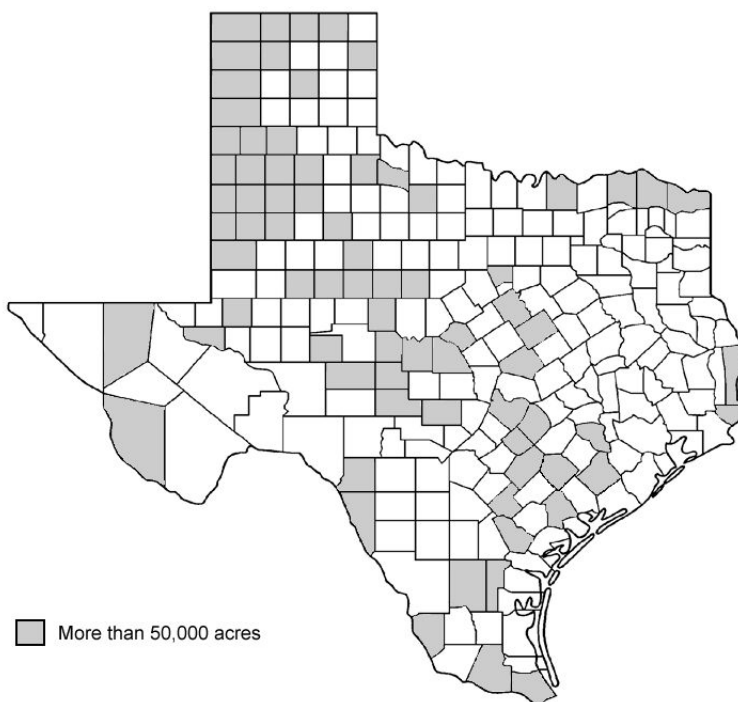
Groundwater is the major source of water for agricultural irrigation in Texas. Irrigation areas in Texas are concentrated in the Panhandle, the Lower Rio Grande Valley, the Winter Gardens, and along the mid-Gulf Coast (see Figure 4). Groundwater is also an important source of water for many cities, as about 20 percent of all groundwater is used for municipal and manufacturing purposes (see Figure 3).

Irrigation water use is on the decline in Texas. From an all-time high of 13 million acre-feet of water used in 1974, irrigation water use declined to 9.6 million acre-feet in 2000 — a decline of about 20 percent. Most of the decline in agricultural use can be attributed to the declining aquifer availability from excessive pumping by irrigators, increased pumping costs, improved irrigation efficiencies, shifts in market demand for agricultural commodities, voluntary transfers of water from irrigation to municipal use, and the decline in cheap water for agriculture.

According to the Texas Water Development Board, irrigation water demand will continue

to decline 10 percent to 15 percent during the next 50 years.¹⁰ Others suggest that this is a conservative estimate, that the rate of decline may even be greater.¹¹

FIGURE 4: Counties with than more than 50,000 acres of irrigated acreage in 1996



Source: Sanger, Mary and Reed, Cyrus. 2000. *Texas Environmental Almanac: 2nd*, (Texas Center for Policy Studies, University of Texas Press: Austin, Texas).

Municipal and Manufacturing Uses

After irrigation, municipalities and industries are the next largest users of water, comprising nearly 35 percent of total annual consumption. The municipal category includes residential, commercial and institutional users. Typically this includes water for households, businesses, restaurants, offices, parks, golf courses and fire protection. Industrial and manufacturing uses are excluded from the municipal category by the Texas Water Development Board.

The manufacturing sector includes any users involved in the production of goods for domestic and foreign markets. Five industries account for 90 percent of the water used by the manufacturing sector of the Texas economy: (1) manufacturing chemical products, (2) petroleum refining, (3) pulp and paper production, (4) primary metal manufacturing, and (5) food processing. Two of these industries — chemical products and petroleum refining — account for nearly 60 percent of Texas' annual manufacturing water use.¹² According to the 1997 and 2002 State Water Plans, municipal and manufacturing are the

fastest growing water use categories and this trend is expected to continue for the next 25 years. The 2002 Texas Water Plan predicts that municipal demand will increase to 7.6 million acre-feet annually, a 67 percent increase from current use.¹³ By 2030, municipal water use is expected to exceed agricultural water use. Manufacturing water demand is projected to increase 47 percent — from 1.8 million acre-feet in 2000, to 2.66 million acre-feet in 2050.

Groundwater is a significant source of water for many cities; about 20 percent of total groundwater use is for municipal and industrial purposes. For example, Amarillo, El Paso, Lubbock, Houston, San Antonio and a number of smaller cities rely on groundwater for use in homes, businesses and industry. Most of the arid western part of the state and a significant part of East Texas rely on groundwater for municipal and manufacturing uses (see Figure 1).

Other Water Uses

Other water uses include activities related to steam-electric power generation, mining and livestock production. In total these categories comprise about 5 percent of total annual Texas water use. Except for mining, water demand for power generation and livestock production is expected to increase during the next 25 to 50 years.

OPPORTUNITIES AND BENEFITS OF WATER MARKETING

Providing an adequate supply of clean water is crucial to ensuring a stable and diversified Texas economy. As much of the state's surface water is fully appropriated and will barely be sufficient to meet water demands during recurring drought periods, Texas must seek other means of developing water supplies. A number of cities are seeking to purchase water from other users rather than building more reservoirs. Water marketing also can play an important economic, political and social role in redistributing scarce water to meet changing demands.¹⁴

Water marketing is the transfer of a water supply between a willing buyer and willing seller. While water marketing transactions can take various forms, all involve either:

- 1) the sale of a water right; or
- 2) the sale of water by means of a lease or water supply contract.

The outright purchase of a water right grants a purchaser the totality and permanency of rights granted in the permit, while supply contracts is a right to use the water.

Drivers for Water Marketing: Population Growth and Limited Supplies

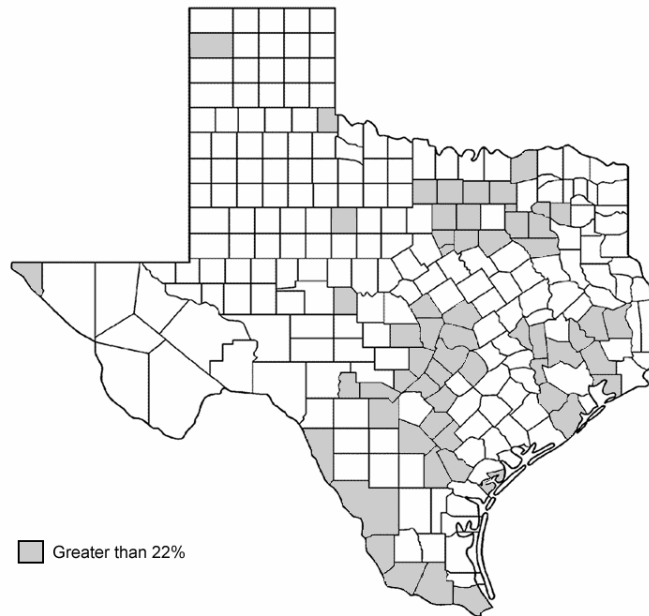
While many rural communities and small cities are growing, most of Texas' new growth is concentrated around big cities and their suburbs. Census data indicates that most of the state's population growth occurs in its major urban centers. The urban areas and growth corridors with the greatest projected water demand are in the greater Austin, Dallas, El Paso, Houston and San Antonio metropolitan areas. Significant increases in municipal water demand will also occur in the Lower Rio Grande Valley (see Figure 5).

Historically, water has been obtained through (1) appropriating surface water rights in rivers where no previous claim to water has been made; (2) constructing reservoirs to capture and store water; (3) groundwater transfers; and (4) surface water transfers. The first two options have limited feasibility today. Most of the rivers in Texas are fully appropriated and there is little water available to fill new reservoirs.¹⁵ The economic, environmental and political difficulty encountered in building reservoirs limits the second option; most favorable reservoir sites have already been developed and those that remain have numerous development constraints. Both the 1997 and 2002 State Water Plans recognized the viability of surface and groundwater transfers and conveyances as a means to meet projected water demands.¹⁶

Cities are looking to rural areas and to agriculture to meet the water needs of this growing population. Some of this water will be supplied by reallocating water from existing agricultural uses to municipal and industrial uses through water marketing.

Water transfer and marketing is not limited to Houston, Dallas or San Antonio; the practice is occurring in the Texas Panhandle, Far West Texas, the Lower Rio Grande Valley and the Hill Country. Amarillo, Lubbock and nine other Panhandle cities have drilled water wells in rural areas and are piping this water to their city customers. There are proposals to pump groundwater from ranches and farms in West Texas to El Paso, and the General Land Office is also considering leasing groundwater under state lands.

FIGURE 5: Counties with Increasing Urban Growth and Water Demand



Source: Map furnished by Steve Murdock, State Demographer.

Benefits of Water Transfers

Throughout the West and in Texas, water marketing and transfers have successfully been used to:

- provide water to growing cities;
- help communities manage drought;
- provide water for environmental and recreational needs;
- promote efficient water use;
- provide an alternative to new reservoir construction;
- provide a new source of revenue for agriculture; and
- encourage bargaining between divergent water interest groups.¹⁷

These transfers indicate that markets do work in reallocating water and are preferred to governmentally-compelled reallocations.

History of Texas Water Transfers

Texas has a long history of transferring and marketing both surface and groundwater and could not have grown and developed without transferring water from areas of surplus to areas of scarcity. Most transfers take place within a watershed; however, a number of transfers occur between river basins (see Figure 6). About 100 such transfers have taken place throughout the years in all areas of the state, with the exception of Far West Texas.

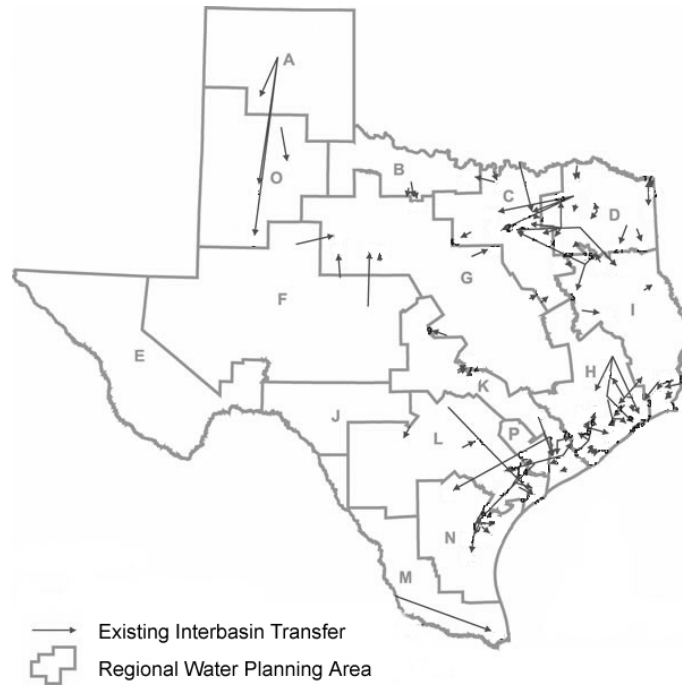
The Texas legislature has established water supply institutions and agencies for the purposes of marketing and transferring water. Texas river authorities are a classic example of marketing and transfers institutions. Although they have other water management tasks, river authorities are major water brokers, wholesalers and retailers. They have as customers, farmers and ranchers, cities, industries and other water supply agencies. For example, the Sabine River Authority holds the surface water rights permit to Lake Tawakoni and it sells a portion of this water to the city of Dallas.

Transfers Proposed by Regional Planning Groups

Regional water planning groups established by Senate Bill No. 1 have embraced water transfers and marketing as part of their plan to meet local water needs.¹⁸ On a statewide basis, water marketing was given high feasibility rankings by regional water planning officials and they have reflected this priority in their plans.¹⁹ Fourteen of the 16 planning regions proposed a total of 53 transfer projects (see Figure 7). Only the Lower Rio Grande Valley (Region M) and Region J (which includes Bandera, Kerr, Real, Edwards, Kinney and Cal Verde Counties) did not propose a transfer project.

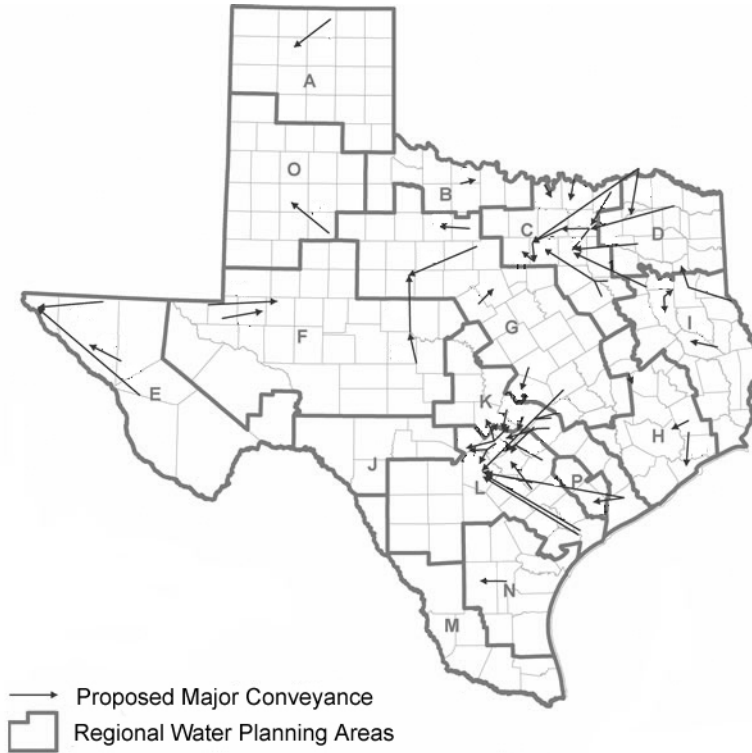
Based on the transfer proposals of the regional planning groups, as much as 2.4 million acre-feet of surface and groundwater will be voluntarily reallocated from primarily irrigation and agricultural water uses to municipal and industrial uses²⁰ — nearly one-third of the current surface water and one-quarter of the current groundwater use. These proposals clearly suggest that water marketing is here to stay and will be a big part of the future of water in Texas.

FIGURE 6: Existing Interbasin Transfers in Texas



Source: Texas Water Development Board, *Water for Texas—2002*, (TWDB, Austin) p. 56.

FIGURE 7: Transfers Proposed by Regional Water Planning Groups



Source: Texas Water Development Board, *Water for Texas—2002*, (TWDB, Austin) p. 77.

Water Marketing and Transfer Requirements

Water markets develop when a combination of economic, legal, institutional and technical factors converge; buyers can obtain a more certain, consistent and reliable water supply relative to other supply options, and sellers realize greater net benefits from transferring the water than by keeping it in an existing use.

The impetus for water marketing, transfers and conveyances in Texas is driven by a number of factors including:

- the increasing demand for municipal and industrial water driven by population growth;
- limited alternative supplies;
- undervalued water uses;
- willing buyers and sellers;
- reasonable transaction costs;
- defined and enforceable rights to water;²¹
- minimal transfer restrictions; and
- a conveyance system.²²

These conditions are present in a number of locations in Texas as indicated by the proposals of the regional planning groups.

Texas Law Relating to Water Transfers

One of the prerequisites of a market-based transfer system is that property rights in water are well-defined, enforceable against third parties, exclusive to the holder of the right and transferable. State water laws establish property rights in water either through legislative enactments or court decisions. In Texas, the legislature has established a property rights system for surface water through the Water Rights Code; the Texas Supreme Court established the property rights system for groundwater. The property rights of each have a major impact on water marketing, transfers and conveyances.

SURFACE WATER LAW AND WATER MARKETING

Surface water belongs to the state of Texas and the right to use this water is granted through a state permit system known as the prior appropriation doctrine. Groundwater is privately owned and landowner rights to this water are determined by the rule of capture, or by rules of groundwater conservation districts.

State Ownership of Surface Water

Surface water is owned, controlled and allocated by the state through a permit system known as prior appropriation. The Texas Commission on Environmental Quality (TCEQ) is the state agency responsible for administering this water law system. State waters subject to appropriation include:

“The ordinary flow, underflow, and tides of every flowing river, natural stream and lake and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater and rainwater of every river, natural stream, canyon, ravine, depression and watershed in the state ...”²³

This statutory definition encompasses waters in navigable rivers, natural streams, including non-perennial streams, and surface water run-off in ravines, canyons, ponds, and lakes.²⁴ Waters imported into the state and put in natural watercourses are also considered property of the state and are subject to appropriation.²⁵

Acquiring a Water Permit by Appropriation or Transfer

In order to divert, use, store or transfer state water, a permit must be obtained from the TCEQ. In addition to the regular permit, the TCEQ may issue more restrictive permits such as seasonal permits, term permits, temporary permits, emergency permits, or bed and banks permits. A water right holder does not have title to the water but only has a state license, or permit, to use and enjoy the water. This permit is a vested property right

that entitles the appropriator to certain protection against termination, loss, or infringement.²⁶

A right to use state water can be acquired by a (1) new appropriation, (2) purchase and transfer of an existing water right within a river basin, (3) purchase or transfer of an existing water right from another basin. All three require a permit from the TCEQ.

Unless one of the exceptions applies, the TCEQ may issue a permit if it finds that: (1) unappropriated water is available at the source; (2) the water will be beneficially used; (3) existing water rights will not be impaired; (4) the proposed use is not detrimental to the public welfare; and (5) reasonable diligence will be used to avoid waste and achieve conservation.²⁷

In addition, the TCEQ must also assess the effects, if any, of the issuance of the permit on: (1) bays and estuaries; (2) existing in-stream uses; (3) fish and wildlife habitat; and (4) water quality.²⁸ While each of these findings represents a potential point of dispute in a hearing, once the positive findings are made, the TCEQ grants the application and issues the permit.

Permit Provisions

Seniority Rule — Seniority is the linchpin of the prior appropriation doctrine. The principle of “first in time, first in right” determines the allocation of water in times of shortage. The priority date is established when the complete application is filed with the TCEQ. When there is an adequate supply of water the seniority rule is seldom used, but when shortages occur seniority determines who gets the water.

Quantified Amount of Water — Under the appropriation system a permit holder is entitled to a measured flow or volume of water. This provision, along with the priority rule, provides an incentive for senior appropriators to invest in diversion by assuring them of a fixed water supply. The quantity is not absolutely guaranteed but is limited to the amount of water beneficially used.²⁹

Transferability — Because it is a vested property right, a water permit is transferable to other users or uses. This feature allows for marketing of water rights. All transfers require approval by the TCEQ; however, transfers resulting in minimal changes may be granted without notice or a contested case hearing.³⁰

Cancellation and Loss of Water Rights — “Use it or lose it” is a guiding requirement of Texas surface water law. Even though a water right is considered a vested property right, the Texas Supreme Court has ruled that this right can be lost if water is not used for a 10-year period.³¹ It is beyond dispute that the TCEQ has the authority to institute an action to cancel a water right. However, the action would be rife with political repercussions and, as a practical matter, the TCEQ has not aggressively sought to cancel water rights.

BARRIERS TO MARKETING SURFACE WATER

In Texas, surface water transfers take one of three basic forms:

- 1) Sale of the permanent water right — This transaction involves the permanent transfer of the water rights permit issued by the state.³² An example of this type of transaction involved the 2002 sale by the Garwood Irrigation Company of its state-issued water rights permit to the Lower Colorado River Authority (LCRA). This water right permit was for 133,000 acre-feet of water per year and it had a 1900 priority date, the most senior water right in the Colorado River Basin. The LCRA purchased the 1900 permit for an estimated \$75 million.
- 2) Lease of the water right permit — This is a short- or long-term transfer of a water right from a seller to a purchaser. The underlying permit is not sold and at the end of the lease period the right to the water reverts back to the lessor/seller. This transaction is most apropos for acquiring water for a time period from 5 to 50 years.
- 3) Wholesale contract for water — In this most common type of transaction, the holder of the water permit contracts to sell water to a purchaser (typically a city) for a fixed term of years. Typically river authorities and water districts, as holders of significant water rights (see Appendix A), are major players in wholesale water contracts.

Factors Impacting Surface Water Marketing

Surface water transfers involving a sale, transfer or lease of a water right must be approved by the TCEQ through a permit amendment process.³³ Generally, wholesale water contracts only require a “rate setting review” by the TCEQ and not an approval of the basic contract. While there are important legal and practical distinctions between the type and form of the transfer, TCEQ approval is required for transfers involving a change in the (1) place and purpose of water use; (2) amount of use; (3) point, method and rate of diversion; and (4) location at which surplus water is returned to the stream.

Texas Commission on Environmental Quality Review and Approval

The type and level of TCEQ administrative review and approval of proposed water transfers can directly impact water marketing because it can increase transfer transaction costs. It is generally accepted that high transactions associated with regulatory reviews can deter voluntary water transfers.

Two patterns of administrative complexity are possible based on the public notice and hearing requirements. Both have an impact on transaction costs.

1) No notice or contested case hearing.

Generally, transfers which involve only a change in ownership, minimal change in water use and no significant harm to other water users are the least complex and may

be granted by the TCEQ without notice or hearing. These transfers will have lower transaction costs and an increased potential for market transfers.

Senate Bill No. 1 added a provision called the “Four Corners Doctrine” that would have facilitated and promoted the marketing of unused water rights.³⁴ This provision basically allowed the TCEQ to approve a transfer amendment for unused water without holding a contested case hearing, if the transfer would not increase the adverse impacts other water rights holders. The Four Corners provision is under challenge by other water rights holders in a case involving a plan by the City of Marshall to sell the unused portion of its water to a power plant. The city used less than one-half of its 16,000 acre-feet permit and was not proposing to increase the amount of water authorized; it only wanted to sell its unused water. The TCEQ approved the request without granting the appellees a contested case hearing. The trial and appeals court reversed this decision and remanded the case to the TCEQ to provide the appellee’s a contested case hearing. This case is currently on appeal before the Texas Supreme Court.³⁵

2) Notice and contested case hearing

Transfers that negatively affect other water rights holders, or that involve a substantial change in the place, purpose and time of use, require greater commission review. This review requires that the TCEQ give public notice of the change and hold a public hearing before approving or denying the transfer request. Public notice and hearing requirements add to water transfer transaction costs and they may have a significant impact on water marketing.

No-Injury Rule

The Water Code provides that a water rights application may not be granted if it would impair existing water rights.³⁶ The TCEQ follows the no-injury rule in reviewing and approving transfer amendments to existing permits. Water transfers involving a change in place, purpose and time of use, or point of diversion, are allowed under the Water Code and TCEQ rules, subject to the condition that the change not impair existing water uses. Transfers may not be granted if they will cause an injury to other existing water rights. The requirement of “no injury” protects the *status quo* and is a major barrier to changing water uses based on changing conditions.

Interbasin Transfers and the Junior Rights Rule

Texas law has long permitted interbasin transfers while at the same time protecting the rights of water holders in the basin of origin. Throughout the years, nearly 100 interbasin transfers have been authorized in areas concentrated in the Panhandle, Northeast Texas and along the Gulf Coast (see Figure 6). These transfers allowed for the marketing of water provided there was no significant injury to water rights holders in the basin of origin. It was clearly the public policy of the state to allow for the marketing and transfer of water from an area of the state with surplus water to an area with a shortage and a need.

In 1997, the Texas Water Code was amended to discourage interbasin transfers with the insertion of the junior rights rule. Codified as §11.085(s) of the Texas Water Code, the junior rights rule requires that any proposed transfer of all or a portion of a water right out of the basin loses its seniority and becomes junior to other rights in the basin. The practical effect of this rule is to reduce the reliability of a surface water right during times of drought which discourages the marketing of water.

While some claim that the rule has protected water in rural areas from the “thirst of growing cities” it may have fostered the opposite effect. In order to provide a reliable source of water to meet residential, commercial and manufacturing needs a number of cities are turning to groundwater as a replacement source.³⁷ Because most of the groundwater resources are in rural areas, the junior rights rule has exacerbated rural and urban tensions over water developments, transfers and markets. Clearly, the junior rights rule has served as a significant obstacle to solving the Texas water supply puzzle.

GROUNDWATER LAW AND WATER MARKETING

Texas treats groundwater differently than surface water. Groundwater is considered the private property of the landowner when it is reduced to possession and control; up until that point, the landowner only has a right to drill a well and a right to try and capture the water. Landowner rights to groundwater are governed by the rule of capture.

The Rule of Capture

From a legal perspective the rule of capture is simple and straightforward. Landowners have the legal right to capture and pump unlimited quantities of water beneath their land, without liability to surrounding landowners. In a practical sense, the surface owner does not own the water but only has a right to pump and capture whatever water is available, regardless of the effect on neighboring wells. Conversely, neighboring landowners have this same right.

Two widely-cited Texas Supreme Court cases — *East* and *Sipriano* — have affirmed and outlined the general parameters of this law. A handful of other appellate court cases have acknowledged and followed the principles of the capture rule.³⁸

Last year (2004) marked the 100th anniversary of the landmark *Houston & T.C. Ry Co. v. East* 81 S.W. 279 (Tex. Sup. Ct. 1904) case, establishing the rule of capture. In adopting this rule, the court found the movement of groundwater:

“... so secret, occult and concealed that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would, therefore, be practically impossible.”³⁹

Following this line of reasoning, the court adopted the English rule of absolute ownership granting landowners the right to withdraw groundwater from beneath their land.

The second and latest case is *Sipriano v. Great Spring Waters of America, Inc.*⁴⁰ (aka Ozarka), decided by the Texas Supreme Court in 1999. The facts of this case, like many other groundwater cases, involved a new user allegedly causing harm to adjoining domestic well owners due to excessive pumping. The plaintiffs, who were domestic well owners, asked the court to impose liability on Ozarka for unreasonable pumping. The court declined, unanimously affirming the capture rule, but chiding the legislature to address well interference and groundwater mining problems.

Three Landowner Rights under the Capture Rule

A landowner has three rights under the capture rule; all three rights are freely alienable and transferable:

- 1) access right of the landowner to capture groundwater;
- 2) ownership right to the water withdrawn and brought to the surface; and
- 3) right sales.⁴¹

Landowners may exercise the right of capture, or sell, lease or assign this right to another. Once assigned, any water captured under the right may be sold and transported off the land, or transferred outside the boundaries of the aquifer.⁴²

Limitations to the Capture Rule

The capture rule is subject to a limited number of judicial and statutory limitations. Each has the potential effect of restricting the amount of groundwater that landowners can capture and use.

Judicial Limitations

At common law, the capture rule is limited by the following restrictions:

- malicious pumping,⁴³
- negligent pumping-subsidence nexus,⁴⁴ and
- waste.

In theory, these three exceptions seem to be major constraints to landowner abuse; yet as applied by Texas courts they are not limitations on exploitation. For example, in *City of Corpus Christi v. Pleasanton*⁴⁵, the Supreme Court adopted the malicious pumping rule but refused to find waste in the transportation of groundwater some 100 miles through a surface watercourse, even though three-fourths of the original supply was lost in transit due to evaporation and seepage.

Correspondingly, in the *Friendswood Development Corp v. Smith-Southwest Industries, Inc.*,⁴⁶ the Supreme Court held that landowners could recover for subsidence losses caused by negligent pumping of groundwater but could not recover if their well went dry.

Essentially sinking land is actionable, but a dry well is not.

Statutory Restrictions

The capture rule is subject to two legislative restrictions. Groundwater may not be subject to the capture rule when it is regulated by:

- 1) groundwater conservation districts,⁴⁷ and
- 2) underflow of a river.⁴⁸

These restrictions illustrate that groundwater is subject to reasonable regulation under the police power of the state to protect the public health, safety and welfare. The Texas Supreme Court, in upholding the constitutionality of the Edwards Aquifer Authority, found that groundwater rights can be regulated but individual landowners could sustain a taking claim under certain circumstances.⁴⁹

Groundwater Conservation Districts — Groundwater, like other forms of real property, is subject to reasonable regulation under the police power to protect public health, safety and welfare. The legislature has established local groundwater conservation districts as the vehicle to regulate groundwater and has indicated its preference for this system. In reality, the legislature has affirmed the rule of capture and the common law exceptions for waste and subsidence in Chapter 36 of the Texas Water Code.⁵⁰

In addition to granting districts the power to control subsidence and prevent waste, Chapter 36 grants several other powers to districts including the authority to:

- preserve, conserve and protect the aquifer;
- regulate well spacing and production;
- minimize the reduction of artesian pressure;
- permit and register wells;
- keep drilling and well records;
- buy, sell, transport and distribute water;
- conduct surveys and research on aquifers and pumping;
- engage in aquifer recharge and recovery;
- require a permit for water transfers; and
- levy taxes and/or pumping fees.⁵¹

Certain wells are exempt from groundwater district regulations and others may be exempted from regulation under grandfathering provisions. While the Texas Supreme Court has sustained the authority of groundwater conservation districts to regulate groundwater they have not precluded challenges to district rules, nor to landowner claims of taking of private property.

Underflow of a River — The Texas Water Code provides that underflow of a river is considered to be state property governed by the surface water laws of the state.⁵² Underflow is not defined by statute but one court has held that it is that portion of the flow of a surface watercourse occurring in the sand and gravel deposits beneath the

surface of the stream bed that is hydrologically connected to the surface flow of the stream.⁵³

Springs and Springflow

It is black-letter law that once groundwater springs to the surface in a watercourse it becomes state-owned surface water subject to allocation under the prior appropriation system. However, if the groundwater is captured before flowing to the surface, then the capture rule applies.

Except for the Edwards Aquifer Authority (which is responsible for protecting spring flows), neither the capture rule nor groundwater conservation districts explicitly protect spring flows. In point of fact, capture rule principles can directly impact spring flows without consequence for the pumper.

In *Pecos County Water Control & Improvement Dist. No. 1 v. Williams*,⁵⁴ the court allowed irrigators to over-pump the aquifer and dry up the springs that contributed to surface water flow at Comanche Springs. The court ruled that the plaintiff's right to use the surface flow from the springs attached only after the water emerged from the ground; prior to that time, the defendant could use any amount of water, regardless of the impact on surface water users. The proximity of a water well and pipe to a spring doesn't matter as long as the well pumps the water before it flows to the surface. In *Denis v. Kickapoo Land Co.*,⁵⁵ the court held that a well sunk into the underground cavern just beneath the spring was capturing groundwater; thus, the well owner was not liable for a reduction in spring flow.

BARRIERS TO MARKETING GROUNDWATER

Under the capture rule, groundwater can be freely purchased and sold by private parties and public agencies; a permit may be necessary only if the pumping is to take place within the boundaries of a groundwater conservation district. A landowner may sell groundwater for off-site use either by selling the water itself or by executing a lease to allow a lessor to install and operate pumps on the landowner's property.

The legal and hydrological barriers to marketing groundwater do not constrain the seller as much as they do the purchaser. The capture rule does not guarantee that a specific measurable amount of water can be sold. It only provides that the amount of water which can be physically captured by the owner can be sold. Thus, the amount of water that can be marketed is highly variable.

A seller of groundwater can only convey to the buyer that amount of water that can be captured. This creates a *caveat emptor* rule since a seller of groundwater cannot provide assurances to the buyer of an exclusive right to a fixed amount of water, nor can a buyer prevent seizure (capture) of the purchased water by an adjacent landowner.

The capture rule has not hindered groundwater transfers as evidenced by the large-scale public and private groundwater transfers proposals that have surfaced around the state. These proposals provide insight in ways to address the lack of a “well-defined and enforceable property right” to a certain and measurable amount of groundwater. While these proposals have engendered interest groups (urban versus rural, agricultural versus urban) and regional and political controversy, they illustrate that the capture rule has not been a major barrier to large-scale groundwater transactions. Given the increases in municipal water demand and changing economic conditions in Texas, it appears that the capture rule is not a barrier to reallocating water to these new needs.

Public Marketing Projects under the Capture Rule

Size matters in overcoming the limitations of the capture rule in groundwater marketing. By consolidating water rights over large tracts of land, public agencies protected themselves from well interference and depletion by other users. The following illustrate some of these creative transactions.⁵⁶

- The City of Amarillo purchased rights to pump from 72,000 acres of land in Roberts County and will build a pipeline to transport the water to the city.
- The City of El Paso purchased rights to pump from 76,000 acres of land in Hudspeth, Valentine and Van Horn Counties and is negotiating for pumping rights on an additional 25,000 acres. These purchases are to provide a future water supply.
- The Canadian River Municipal Water Authority purchased rights to pump from 43,000 acres of land in order to supply water to 11 cities in the Texas Panhandle.
- The City of San Antonio has a contract with Alcoa to pump and transfer 55,000 acre-feet of groundwater from Lee and Milam Counties.

Private Marketing Projects under the Capture Rule

Landowners can also develop various business arrangements for the purposes of marketing groundwater. Among the more common forms are landowner partnership, cooperatives and private corporations. All are predicated on amassing a significant quantity of water so as to satisfy the private property rights component necessary for good markets. These relationships, by private agreement, provide for quantifying the amount of water to be produced, monitoring pumping and transferring the water to the purchaser, thus satisfying the property rights component of marketing. Some examples include:

- Mesa Water, a landowner partnerships originated by T. Boone Pickens, has amassed 150,000 acres of land in Roberts County and is seeking a purchaser for this groundwater.

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- Brazos Valley Water Alliance, a landowner cooperative, has accumulated 133,000 acres of land in Brazos, Robertson, Burleson and Milam Counties and is seeking a purchaser for their water.
- Carrizo-Wilcox Water Alliance (formerly Metropolitan Water Corp.) has acquired rights to pump from about 33,000 acres in Burleson, Lee and Milam Counties and is seeking to build a pipeline to furnish water to a customer.
- Rio Nuevo, Ltd. seeks to lease groundwater pumping rights on about 350,000 acres of state lands in West Texas. These lands are administered by the General Land Office.
- Water Texas, a private firm, is working with landowners in Kinney, Lee and Milam Counties to obtain groundwater pumping rights.

OBSERVATIONS

- 1) Water markets traditionally have required “certainty of private property rights” in order to function. Although the capture rule does not include a property right to a quantified amount of water, it has not been a barrier to groundwater marketing, transfers and conveyances.
- 2) Groundwater marketing and transfers have several benefits for purchasers and sellers. For purchasers, such as cities, it provides a reliable source of water. For landowners and farmers, it is a source of money. For environmentalists and other interest groups it is an alternative to constructing costly reservoirs.
- 3) Because most groundwater transfers involve moving water from rural to urban and suburban areas and from agricultural uses to municipal uses, they generate political controversy regarding the potential economic and social impacts on rural areas. One way to address these impacts is through the establishment of a mitigation fund whereby purchasers would provide payments to the fund and the revenues would be used to mitigate potential impacts.
- 4) When farmers use surface and groundwater for irrigation, they are indirectly transferring and exporting water through their crops. Some landowners would prefer to directly export water rather than growing crops to export water.
- 5) Groundwater marketing has a long and storied history in Texas. It is not a new phenomenon. Cities, farmers, ranchers and industries have been transferring water for years. What is somewhat novel is the participation of the private sector, as a broker, in groundwater marketing.

Groundwater Districts Facilitate and Restrict Water Marketing

Groundwater may be managed by individual landowners, landowner association's private landowner partnerships or by groundwater conservation districts.⁵⁷ These districts may change the capture rule by developing and enforcing rules limiting groundwater pumping based on tract size or by well spacing restrictions. Most districts have developed well spacing rules and a few have developed and enforced pumping restrictions.

Groundwater conservation districts facilitate the marketing of groundwater by enhancing the private property rights of landowners to a quantified amount of water; they also restrict landowner's rights to sell and market their groundwater by limiting the amount of water that can be sold and by imposing fees on the transfer.

Facilitation of Water Transfers

A groundwater conservation district can facilitate water transfers by establishing, through a permit system, a landowner right to a quantified amount of water. When a landowner receives a permit to pump a certain amount of water they have the legal right to this water. In a round-about way, a groundwater conservation district regulation can facilitate a water market by establishing through the permit, a property right to the water.⁵⁸

Restrictions on Water Transfers

It is axiomatic to water marketing that groundwater rights must be fully transferable to all types of uses, users and locations. Placing restrictions on the transferability of these rights will impede the efficiency and effectiveness of water markets.

Groundwater conservation districts impede the groundwater transfers by limiting the amount of water that a landowner can export and by imposing export fees on the water transferred.⁵⁹ Although a district may not absolutely prohibit water exportation they may limit the amount of water that can be marketed and exported. One way districts can impede transfers is by intruding into the affairs of another governmental entity by inquiring as to their need for water.⁶⁰ Groundwater conservation districts can limit private property rights and water transfers by finding that an importing area does not need the water and use this as a basis for limiting exports.

Another district limitation that constrains water transfers is the exportation fee that may be imposed for water transported outside district boundaries. Interestingly, water transferred within the boundaries of a district is not subject to these fees. These export fees can limit transfers by increasing transaction costs to the point that the transfer is no longer economically feasible.

Groundwater Conservation Districts Impact Local and Regional Economies

It is beyond dispute that the Texas economy is diversified, is not uniform throughout the state and is in a state of change in rapidly urbanizing areas. For example, the agricultural

economy in the Texas Panhandle is clearly different than that in the Austin-to-San Antonio I-35 corridor. It is also clear that local and regional economies transcend the boundaries of groundwater conservation districts.

What is becoming clearer, especially in urbanizing areas, is that groundwater conservation districts may negatively impact a local or regional economy. This perhaps is the rule of unintended consequences resulting when the legislature intended groundwater conservation districts to protect the aquifers but the regulations ended up impacting the economy in ways never intended by the regulations.

This begs the question, “Did the Texas legislature intend for groundwater conservation districts to regulate or negatively impact a local or regional economy”? If the answer is “yes”, then groundwater conservation districts were not given legislative guidance in conducting economic impact analysis, nor required to coordinate their regulatory actions with other local units of government responsible for economic development. If the answer to the question is “no”, then perhaps the legislature needs to re-examine the economic implications of this regulatory authority. Either way, further review is needed.

ENHANCING PRIVATE PROPERTY RIGHTS PROTECTION IN GROUNDWATER

Last year (2004) marked the 100th anniversary of the landmark *Houston & T.C. Ry Co. v. East 81 S.W. 279* (Tex. Sup. Ct. 1904) case establishing the rule of capture under which Texas landowners may pump as much groundwater as they want from their land without regard to harming their neighbors. In 1999, the Texas Supreme Court reaffirmed the capture rule in *Sipriano v. Great Spring Waters of America Inc.* (commonly called the Ozarka case) but encouraged the legislature to address the shortcomings of the rule through appropriate legislation.

Suggestions to revisit the capture rule have come from a number of interest groups, citizens and water officials. Without widespread support from diverse water interest groups, the likelihood of legislatively abolishing the capture rule is slight. However, improvements to the capture rule to protect private property rights of landowners who rely on groundwater for domestic uses should be considered.

Protecting Rural Domestic Wells

Most of the domestic well interference problems arise when high-capacity commercial, irrigation, or municipal wells are located near small-capacity domestic wells. These well interference problems usually occur when “Ozarka” becomes your neighbor and the burdens are mostly imposed on rural landowners who have limited access to public water systems. The capture rule affords Texas domestic well owners little private property protection from interference by high-capacity wells and they bear the economic brunt and familial hardship of having their wells go dry. From a legal perspective, protecting pre-

existing domestic wells from unreasonable interference protects private property rights and home ownership values.

PRIVATE SECTOR ROLE IN WATER DEVELOPMENT

While Texas law establishes the allocational rules, water institutions develop and distribute surface and groundwater resources. Public and private water institutions form a complex, multivariable industry that includes federal, state and local public agencies and private corporations that plan, finance and regulate wholesale and retail water. Providing water has traditionally been a public responsibility. In all there are about 1,350 federal, state and local water agencies in Texas involved in managing water.⁶¹ About 810 of these agencies are local municipal utility districts (often called MUDs) that have responsibility for developing and distributing water to residential areas.

Historically private entities have been involved in transporting and selling water to agriculture through private ditch companies and in furnishing water for residential and manufacturing purposes as private water supply corporations. Recently several private companies have taken the lead in buying and selling of surface and groundwater for future municipal use. This is not a new role for the private sector. What is novel is the size of the projects proposed by private firms.

The private sector has an important role in three areas of water development and management:

- 1) developing water sources,
- 2) transporting water, and
- 3) distributing water to customers.

Whether the role for the private sector fits within the rubric of “water marketing” or “water management” is largely irrelevant as private investments have and will continue to be made in each area.

Developing Water Sources

Because of the massive expenditures required for developing and managing reservoirs, federal and state agencies have taken the lead in building and managing surface water developments. However, the private sector has also been involved in developing surface water resources though the ownership of surface water permits (see Appendix A for a listing of private ownership interests in surface water). There are opportunities for greater public-private partnerships in developing groundwater resources and in developing desalination facilities.⁶²

Transporting Water

Seldom is the water source adjacent to the intended use. Consequently, Texas has developed pipelines, canals and used natural waterways to convey water to the end user. For example, the Canadian River Municipal Water Authority (CRMWA) has developed a lengthy pipeline system to deliver both surface and groundwater from Lake Meredith to some 11 cities in the Texas Panhandle. Another example of a pipeline system is that used by the City of Dallas to transport water from Lake Tawakoni to the metroplex.

Most conveyance systems are publicly owned but there are opportunities for public-private partnerships in the development of new conveyance systems, especially in the transportation of groundwater. Recently the Brazos River Authority has explored the feasibility of partnering with Mesa Water (a private partnership developing groundwater resources in Roberts County) in order to transport water to the Dallas Metroplex.

The 2002 State Water Plan identified the need for 53 new conveyance systems to deliver water supplies to areas of need (see Figure 7). Most of these will convey water from rural to larger urban areas of the state.

Distributing Water

Both the public and private sectors have been involved in developing, owning and managing public water supply and water treatment facilities. These facilities may include wells, water treatment plants and distribution pipeline to customers. Most of the private water supply corporations are located in rural areas.

CONCLUSIONS

The reallocation of surface and groundwater through voluntary transfers and water marketing is one way to meet future Texas water demands. Although transfers are allowed in the current Texas regulatory regime, a number of reforms are needed to further encourage and improve voluntary transfers of surface and groundwater in Texas. These reforms primarily address needed changes in regulatory burdens imposed in surface and groundwater law and are intended to further foster water transfers, protect private property rights, improve groundwater management related to markets, and to encourage private investments in water development.

RECOMMENDATIONS

Water Marketing

In order to protect private property rights in water and to encourage greater bargaining among competing water interest groups, the Texas Water Code should be amended to indicate that, as a matter of public policy, voluntary transfers of surface and groundwater through marketing are the state's preferred method for reallocating water.

Marketing of Surface Water

- 1) Texas law should be changed to exempt small-scale transfers of less than 3,000 acre-foot/year from the no-injury and contested case hearing rule if the TCEQ finds that they have a *de minimus* impact on downstream users. (The 3,000 acre-foot per year limitation has been legislatively determined to have a minimal impact on Interbasin transfers and is exempt from the junior rights rule.)
- 2) Chapter 11.122(b) of the Texas Water code should be amended to explicitly authorize a transfer of the entire amount, or any portion, of a water right without a contested case hearing if the TCEQ finds that the transfer does not cause an unreasonable adverse impact on other water rights holders, or on the environment.
- 3) The “no injury rule”, or “adverse impact rule” is a major barrier to water transfers and Texas law should be changed to a “no unreasonable or adverse injury” rule.
- 4) The legislature should provide guidance to the TCEQ regarding criteria that could be used in determining “unreasonable adverse injury.”⁶³

Interbasin Surface Water Transfers

In order to provide for the orderly development of water resources and to encourage water marketing, the junior rights rule on interbasin transfers should be removed from Texas surface water law.

Groundwater Law and Transfers

The capture rule has not hindered substantial water marketing transfers and if it is the policy of the state to protect private property rights and to encourage voluntary transfers then the capture rule need not be changed.

Groundwater Conservation Districts and Water Transfers

- 1) If a public policy purpose is to protect landowner rights to sell their groundwater and by this method to reallocate water to its highest and best use for the benefit of all Texans, then Texas law should be changed to remove the restrictions that groundwater conservation districts can impose on the free market transfer of water. Chapter 36, of the Texas Water Code should be changed to provide that the only basis for restricting the transfer of groundwater outside the district is when the transfer would unreasonably and permanently harm the aquifer.

- 2) In order to remove the chilling effect of export fees, Texas law should be changed to eliminate export fees on water transported outside the district.
- 3) If export fees are justified on the basis that they can mitigate negative community impacts from the exportation of water, then Texas law should be changed so that if a fee is levied, the amount of the fee is small enough not to discourage transfers and it must be universally applied. Further, the fees collected should be dedicated for use in a water infrastructure fund and not be used to offset the operational costs of the groundwater district.

Economic Impact of Groundwater District Regulations

- 1) The Texas legislature should direct that an analysis of groundwater district legislation be undertaken to determine if and how districts impact the local and regional economy.
- 2) If the Texas legislature intended that economics be a factor in groundwater conservation district regulations, then groundwater conservation districts should be required to undertake an economic impact analysis to determine how their pumping regulations impact private property rights and the local and regional economy.

Improving Private Property Rights Protections under the Capture Rule

The capture rule should be legislatively improved to provide protection to the private property rights of pre-existing domestic well owners.⁶⁴ The legislature:

- 1) could extend this protection only to pre-existing domestic wells producing less than 25,000 gallons per day from unreasonable harm caused by high-capacity wells capable of producing more than 25,000 gallons per day;⁶⁵ and
- 2) could adopt specific criteria that the parties and courts could use to determine if there was unreasonable harm caused by non-domestic, high-capacity wells.⁶⁶

Private Sector Role in Water Development

- 1) The private sector can play an important role in providing surface and groundwater resources for municipal and industrial uses. Barriers to developing public-private partnerships should be removed where the private sector makes substantial investments in a project.
- 2) The legislature should study the feasibility of adopting the “common carrier” concept in authorizing the construction of new water pipelines and conveyance systems.
- 3) The feasibility of using “common carrier” concepts for existing transportation and conveyances should also be examined.
- 4) Texas law should be changed to allow state financial assistance to be made available to public-private partnerships involved in water conveyance and distribution projects.

ENDNOTES

- ¹ Compounding problems associated with shifting to supply management are issues related to providing water for the environment, fisheries, wildlife, recreation and tourism needs. With few exceptions these needs were not considered when our surface water was allocated for municipal, industrial and agricultural uses and the challenge is to determine not only how much water is needed but how the law can be improved to provide this water. For one environmental perspective on environmental flow needs, see www.texaswatermatter.org.
- ² This shift began with the 1984 Texas Water Plan prepared by the Texas Department of Water Resources. The Plan identified water conservation as one way to address the future demand for water. See Texas Department of Water Resources, Water for Texas – 1984, Vol 1 (TDWR, Austin, Texas) pp. 57-59. In 1985 the Texas Legislature mandated that political subdivisions receiving state funds be required to set up conservation programs and that new surface water permits would require the preparation of a water conservation plan as part of the permit process. See Texas Water Code § 11.134(4).
- ³ Texas Water Development Board, Water for Texas – 2002 (TWDB, Austin) at 44 (hereinafter Water for Texas – 2002).
- ⁴ East Texas rivers include the lower Red, Sulphur, Sabine, Neches, Trinity and San Jacinto.
- ⁵ Panhandle rivers include the Canadian and upper stretches of the Red; Deep South rivers include the San Antonio and Nueches and Far West Texas include the Rio Grande, Pecos, and Devils rivers.
- ⁶ According to the Texas Water Development Board, only 8.6 million acre-feet of water may be used because of limitations in infrastructure, water permit restrictions and lack of water supply contracts. See, Water for Texas – 2002, at p. 48.
- ⁷ *Ibid.* at p. 52.
- ⁸ An acre-foot is a common measure used to explain water volume and usage. One acre-foot is enough water to cover 1 acre of land to a depth of 1 foot; it is equivalent to 325, 851 gallons of water. A family of five uses about 1 acre-foot of water per year.

More people live in Texas today than 30 years ago but we use less water today than we did then. Between 1930 and 1980, statewide water use increased from 3 million to 18 million acre-feet per year while our population grew from nearly 6 million to about 14 million. Since 1980 we have grown to become the second most populated state in the nation with some 21 million residents, yet our water consumption has dropped to about 16.5 million acre-feet. Most of this decline is related to declining water use for agricultural irrigation.
- ⁹ Sanger, Mary and Reed, Cyrus. 2000. Texas Environmental Almanac: 2nd. (Texas Center for Policy Studies, University of Texas Press: Austin, Texas) at p. 12.
- ¹⁰ Texas Water Development Board, Water for Texas – 1997 (TWDB, Austin, Texas), at p. 2-21 and Water for Texas – 2002, at p. 35.
- ¹¹ See Ball, Laura. 2003. Irrigation Demand in Texas, An Analysis of Methodologies to Predict Irrigation Trends, (Environmental Defense, Austin, Texas,) available at www.texaswatermatters.org.
- ¹² Water for Texas – 2002, at p. 34.
- ¹³ Water for Texas – 2002, at p. 34.
- ¹⁴ For some articles and papers on water marketing in Texas see Ronald Griffin & Fred Boadu, Water Marketing in Texas: Opportunities for Reform, 32 NATURAL RESOURCES J 265 (1992); Ronald Kaiser, Texas Water Marketing in the Next Millennium: A Conceptual and Legal Analysis, 27 TEXAS TECH LAW REV 181 (1996); Mike Willatt, Buying and Selling Water Rights in Texas, 59 TEXAS BAR J 628 (1996); Ronald Griffin & G. Characklis, Issues and Trends in Texas Water Marketing, 121 WATER RESOURCES UPDATE 29 (2002); Texas Water Development Board, A Texan's Guide to Water and Water Rights Marketing, (TWDB, Austin 2003) A recent report by the Texas Chapter of Environmental Defense provides one environmental perspective on marketing. See Environmental Defense, A Powerful Thirst: Water Marketing in Texas. (Austin, Texas) 2004, available online at www.texaswatermatters.org.
- ¹⁵ According to data from the Texas Natural Resource Conservation Commission, there is limited or no water available for new appropriation in the following river basins: Brazos, Canadian, Colorado, Cypress, Guadalupe, Neches, Nueces, Sabine, San Antonio, Trinity, Red and Rio Grande. See Texas Natural Resource Conservation Commission, A Regulatory Guidance Document for Applications to Divert, Store, or Use Water (TNRCC, Austin, 1994) at 19.
- ¹⁶ See Texas Water Development Board, Water for Texas – 1997 at p. 4-1 and Water for Texas – 2002 at p 76.
- ¹⁷ For numerous sources and examples of benefits see Ronald Kaiser, Texas Water Marketing in the Millennium: A Conceptual and Legal Analysis 27 TEXAS TECH LAW REV 181 (1996). Texas Water Plans recognized the potential of water marketing. For example, the 1990 Texas Water Plan suggests that future municipal water demand can be met by reallocating existing water supplies with minimal need for new reservoir development. See Texas Water Development Board, Water for Texas – 1990

(TWDB, Austin) at 4-1.

- ¹⁸ Sixteen Regional Planning Groups were established with approximately 450 representatives from 11 different interest group categories. They work for more than 3 years to develop their 16 regional plans. Nearly 900 public meetings were held by the 16 groups as they developed their plans.
- ¹⁹ See Ronald Kaiser, et al., 2000. Water Management Strategies: Ranking the Options, (Texas A&M University System, College Station) at p. 7.
- ²⁰ Water for Texas – 2002, at p. 73.
- ²¹ Economists argue that defined and enforceable property rights in water are a critical factor in facilitating market-based transfers. A property rights system that embodies water ownership, exclusivity, transferability and enforceability can produce an efficient allocation of water. See for example Clay Landry. 2000. A Free Market Solution to Groundwater Allocation in Texas, (Austin: Texas Public Policy Foundation).
- ²² A means of efficiently and effectively moving water from the seller to the new purchaser must exist. This conveyance is not a problem for surface water transfers if the purchaser is downstream from the seller. The seller merely uses the natural conduit (the river) to convey water. The importance of a conveyance system to an effective water market is illustrated by the states of California and Colorado. Both have elaborate systems for moving water from the source of supply to the user.
- ²³ Texas Water Code § 11.021.
- ²⁴ *In re Adjudication of Water Rights of the Lower Guadalupe Segment*, 730 S.W.2d 64 (Tex. Civ. App.–Corpus Christi 1987) (surface waters collecting in natural depression on privately owned land are state waters).
- ²⁵ Texas Water Code § 11.021(b).
- ²⁶ For loss of rights through cancellation proceedings see Texas Water Code §11.172. Interfering with or impairing a water right without improper authority is unlawful, see Texas Water Code §§11.081-.083.
- ²⁷ Texas Water Code §§11.134, 11.147.
- ²⁸ *Ibid*, §11.150.
- ²⁹ *Ibid*, §11.025.
- ³⁰ *Ibid* §11.122.
- ³¹ *Ibid*, §§11.171-11.186.
- ³² See Ronald Kaiser, Texas Water Marketing in the Millennium: A Conceptual and Legal Analysis 27 TEXAS TECH LAW REV 181 (1996), at 196-203.
- ³³ Texas Water Code § 11.122.
- ³⁴ Texas Water Code §11.122(b).
- ³⁵ *City of Marshall, et al v. City of Uncertain*, 124 SW3d 690 (2003).
- ³⁶ Texas Water Code §11.134(b) (3) (B).
- ³⁷ See Scott Parks, *Water Investors Eye Liquid Assets: Demand Creates a Market for Aquifer Right in Texas*, Dallas Morning News, May 21, 200 at 1A.
- ³⁸ See *Barshop v. Medina Co. Underground Water Conserv'n Dist.*, 925 S.W. 2d 618 (Tex 1996); *Denis v. Kickapoo Land Co.*, 771 S.W.2d 235 (Tex. App.–Austin 1989, writ denied); *City of Sherman v. Public Utility Comm'n of Texas*, 643 S.W.2d 681 (1983); *Beckendorf v. Harris-Galveston Coastal Subsidence Dist.*, 558 S.W.2d 75 (Tex. Civ. App.-Houston[14th Dist] 1977, writ ref'd); *Friendswood Dev. Co. v. Smith-Southwest Indus., Inc.*, 576 S.W.2d 21 (Tex. 1978); *City of Corpus Christi v. Pleasanton*, 276 S.W.2d 798 (Tex. 1955); *Pecos County W.C.I.D. No. 1 v. Williams*, 271 S.W.2d 503 (Tex. Civ. App.- El Paso 1954, writ ref'd n.r.e.); *Lower Nueces Water Supply Dist. v. City of Pleasanton*, 251 S.W.2d 777 (Tex. App.-San Antonio 1952, no writ).
- ³⁹ *Ibid*. at 280 (quoting *Frazier v. Brown*, 12 Ohio State 294, 314 (1861)).

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- ⁴⁰ 1 SW2d 75 (Tex. 1999).
- ⁴¹ See City of Altus, 255 F. Supp. 828 and Evans v. Ropte, 96 S.W.2d 973 (Tex. 1936).
- ⁴² City of Corpus Christi v. Pleasanton, 276 S.W.2d 798 (Tex. 1955).
- ⁴³ *Ibid.*
- ⁴⁴ Friendswood Development Corporation v. Smith-Southwest Industries, Inc, 576 S.W.2d 21 (Tex. 1978).
- ⁴⁵ 276 S.W.2d 798 (Tex. 1955).
- ⁴⁶ 576 S.W.2d 21 (Tex. 1978).
- ⁴⁷ See Texas Water Code, Chapter 36.
- ⁴⁸ Texas Water Code §11.021.
- ⁴⁹ Barshop v. Medina County Underground Water Conser'n Dist, et al. 925 S.W.2d 618 (Tex. 1996).
- ⁵⁰ See Texas Water Code §36.002 recognizing rule of capture and §36.101(a) recognizing waste and subsidence.
- ⁵¹ See generally Texas Water Code §§36.101 - 36.1071.
- ⁵² Texas Water Code §11.021.
- ⁵³ Texas Co. v. Burkett, 296 S.W.2d 273 (Tex. 1927).
- ⁵⁴ 271 S.W.2d 503 (Tex. Civ. App. – El Paso 1954, writ *ref'd n.r.e.*)
- ⁵⁵ 771 S.W.2d 235 (Tex. App-Austin, 1989, writ *denied*).
- ⁵⁶ Sources: Environmental Defense, A Powerful Thirst (Austin Texas) 2004 available online at www.texaswatermatters.org.
- ⁵⁷ For a discussion of the powers, duties and limitations of groundwater conservation districts see B. Lesikar, R. Kaiser & V. Silvy, Questions about Groundwater Conservation Districts in Texas, Texas Cooperative Extension, Publication B-6120, 06-02, available online at <http://texaswater@tamu.edu>
- ⁵⁸ See Clay Landry. 2000. A Free Market Solution to Groundwater Allocation in Texas, (Austin: Texas Public Policy Foundation) suggesting that water permits are an element of a private property rights system.
- ⁵⁹ Texas Water Code §36.122 deals with water exportation and generally provides that while a district cannot prevent a sale and export of water by a landowner it can limit the amount of water that can be exported outside the district by considering the availability of water in the district and in the proposed receiving area, the projected effects of the transfer on aquifer conditions, depletion, subsidence or existing users within the district and if the transfer is congruent with their district management plan and the state regional water plan.
- ⁶⁰ *Ibid*, §36.122(f)(1).
- ⁶¹ Texas Comptroller of Public Accounts, Water Marks, 92:6 Fiscal Notes 1 (TCPA, Austin-June 1992) at p. 4.
- ⁶² See James Smith, Hold the Salt: The Promise of Desalination for Texas, Research Report of Texas Public Policy Foundation, October 2004.
- ⁶³ This criteria could include factors such as the : (1) purpose of each use; (2) economic and social value of each use; (3) the type and amount of measurable harm that may be caused by the transfer; (4) the protection of investments and property rights.
- ⁶⁴ This recommendation would not change the authority of groundwater conservation districts to modify the capture rule with well spacing requirement or to replace it with correlative rights, historic use or reasonable use rules for wells within their jurisdiction. Districts have limited authority to redress well interference conflicts between landowners. This recommendation would empower and protect the private property rights of pre-existing domestic well owners and would not impact the authority of districts.
- ⁶⁵ Only in cases where high-capacity wells unreasonably interfered with the pre-existing domestic well could relief or damages be granted to the domestic well owner. No compensation would be required if the pumping by the high-capacity, non-domestic well was reasonable.

Market-Based Allocation of Water

⁶⁶ Factors to determine unreasonable harm could include: (1) the purpose of each use; (2) economic and social value of each use; (3) the extent and amount of harm caused; (4) the practicality of adjusting the quantity of water used by each well owner; and (5) the protection of existing domestic uses and the investment backed expectations of the parties.

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