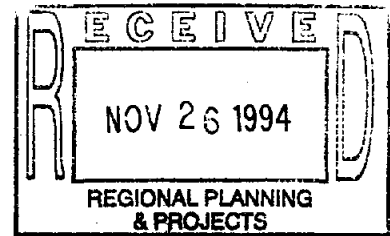


**AN ANALYSIS OF THE LEGAL AND INSTITUTIONAL PARAMETERS
FOR WATER MARKETING IN TEXAS**

Ronald A. Kaiser

Frederick Boadu



A REPORT TO THE TEXAS WATER DEVELOPMENT BOARD

**Texas A&M University
Texas Agricultural Experiment Station**

August 1994

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by

**Ronald A. Kaiser
Associate Professor
Texas A&M University
and
Frederick Boadu
Associate Professor
Texas A&M University**

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EXECUTIVE SUMMARY

Texas has reached a crossroads in the management of its water resources. Water demand in the state continues to grow while the opportunity to develop new supplies continues to shrink. Urban growth, industrial and tourism development, environmental needs and recreation uses are creating new demands for water. To meet these new demands management practices must shift away from building new reservoirs and pumping more groundwater to conservation and reallocation of existing water. Forecasts in the 1990 Water for Texas Plan suggest that increases in water use efficiency and conservation could reduce municipal water use by 21 percent and agricultural water use by nearly 40 percent by the year 2020. Even with these conservation savings new demands for water cannot be met without reallocating some water.

Water can be reallocated by the cancellation of unused water rights or by the voluntary transfer of water rights between willing buyers and sellers. Water marketing is particularly suited for meeting the new water demands because it encourages voluntary transfers rather than forced reallocations and because it moves water from lower valued agricultural uses to higher valued urban uses.

Transferring water through marketing will have implications for agriculture. Given that agriculture consumes about 70 percent of the total water in the state many of the important conservation and transfer issues will involve the movement of water from agriculture to municipal, industrial, environmental and recreational uses.

The 1990 Water Plan points out that Texas does not have a formal or effective mechanism to promote water transfers or reallocation to more efficient uses. It recommends a review of state water law and regulations to identify restrictions on water transfers and to recommend changes to encourage voluntary water transfers.

This report addresses water conservation and marketing issues and was prepared Texas A&M University and the Texas Agricultural Experiment Station under a contract with the Texas Water Development Board. The specific objectives for the report were to:

- (1) review Texas water law, regulations and institutions to identify the potential for water conservation and marketing;
- (2) identify the criteria and values to be achieved by water marketing;
- (3) evaluate policies, laws and institutional structures in other western states that have used water marketing;
- (4) review strategies and justifications used in various allocation methods to reallocate water considering economic, environmental, institutional and legal constraints; and
- (5) recommend changes in state water laws, rules and policies to encourage water conservation and to facilitate water transfers using a marketing approach.

These objectives were address through a detailed literature review, consultation with many water experts at Texas A&M University, other Texas state agencies, water agencies in other states and through a legal analysis of Texas water law. The authors would particularly like to acknowledge the invaluable research assistance provided by Dr. James Mertes of Texas Tech University.

Findings

In assessing the techniques to encourage water conservation and to reallocate water through marketing mechanisms, the authors found that:

- ★ Water markets require the following conditions: legally defined and transferable property rights in water; a critical mass of buyers and sellers; a market information system; an efficient conveyance system to move the water; low valued water used; demand for higher valued water; fully appropriated waters; limited availability of alternative supplies; and urban growth creating a demand for water.
- ★ Water marketing is a viable water management strategy for Texas. Other states that use water marketing find that it: (1) can provide water to growing cities; (2) is a tool for managing drought; (3) promotes the efficient use of water; (4) promotes water conservation; (5) provides water for environmental and recreational needs and uses; (6) offers an alternative to new reservoir construction; and (7) promotes political harmony among stakeholders.
- ★ A viable water market exists in the Lower Rio Grande Valley controlled by a unique set of legal rules, water conditions and population growth patterns. These conditions are not currently replicable in other river basins. Until the conditions necessary for the development of water markets exist in other river basins, the opportunity for water marketing is limited.
- ★ Texas groundwater water law permits the sale of water but it does not encourage marketing of groundwater. The rule of absolute ownership or capture does not promote certainty, consistency and predictability in determining the amount of water that can be marketed. Further, groundwater law does not guarantee to the seller nor the purchaser exclusivity and enforceability of a right to a measured amount of water. The only amount of water that can be guaranteed is that amount which can be captured.
- ★ Texas surface water law permits the reallocation of water through market based transfers and contains few major obstacles to marketing. One major obstacle is the no-injury rule. Water transfers involving a change in place, purpose, time of use, or point of diversion are allowed provided that the change does not impair (no-injury) existing uses. The most viable solution to the no-injury rule is to limit the amount of water transferred to that consumptively used during the previous 5 years.

- ★ The Texas interbasin transfer restriction does not constrain the development of intrabasin water markets but it may be an obstacle to the development of interbasin water markets. Interbasin transfers are allowed if they do not prejudice any person situated within the watershed from which the water is proposed to be taken. When interbasin transfers are proposed, all reasonably determinable economic, environmental and social costs and consequences should be considered in reviewing the proposal.
- ★ Interbasin transfers of water have the potential to cause significant third-party, economic, political, social, cultural and environmental impacts. Texas law does not account for these values in water transfer cases. Public interest criteria are needed to assess the viability of transfers. The criteria should distinguish between large and pervasive effects and smaller ephemeral impacts.
- ★ Texas needs to move away from the punitive approach and restructure conservation strategies to offer incentives to users to conserve water. Water conservation can be enhanced by authorizing the conservor to market that portion of water saved by conservation practices, instead of facing the specter of a water cancellation action for non-use.
- ★ Significant potential exists for recycling municipal effluent as a means of providing additional water supplies. Approximately 2.4 million acre-feet of treated effluent was returned to streams by municipalities in 1993. The biggest legal obstacle to marketing treated effluent is the uncertainty over ownership rights to the water. Texas law should clarify that the legal rights to market treated effluent belong to the producer.
- ★ Water marketing may provide water for instream uses to maintain and protect environmental resources and minimize the potential for the use of the public trust doctrine. Prior to 1985, Texas did not recognize and consider minimum instream flows to maintain the environmental and ecological integrity of riverine and estuarine systems. Other western states, and in particular California, have used water marketing to acquire water rights for instream flows. The Texas Water Bank is in a unique position to acquire instream flow water rights.
- ★ By the amount of water they control and the unique position they hold in water management, river authorities play a significant role in facilitating water marketing. Ten river authorities hold water rights to more than six million acre feet of water supplying about 20 percent of the consumptively used surface water in the state. The Texas Water Development Board and the Texas Water Bank must work closely with river authorities in developing state water marketing strategies.

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CHAPTER I. INTRODUCTION

I. WATER MANAGEMENT IN TRANSITION

Texas has reached a crossroads in seeking to furnish an adequate supply of water to meet the needs of the state. Although the state is blessed with a bountiful supply of water, it is not always in the right place at the right time. This water imbalance is evident in the Texas water use and supply patterns. About 80 percent of the 17 million Texans live east of Interstate Highway 35 (IH-35), and they use about 56 percent of the state's water. This area of the state has an adequate supply of surface water.¹ About 20 percent of Texas' residents live in the semi-arid areas west of IH-35 and they use about 44 percent of all the state's water. The scarcity of rainfall in the western region requires extensive use of groundwater. In this more rural area of the state, about 85 percent of all the water used irrigates crops.²

Until the mid-1970's, a simple formula governed water management in Texas. Drill more wells and pump more groundwater, or find unappropriated surface water and build a reservoir and distribution system. This simple formula no longer works. Most of the surface water is fully appropriated and will barely be sufficient to meet current water demands during prolonged drought periods. In addition, opportunities for the development of new reservoirs are limited by fiscal physical, and environmental constraints.³ Further, groundwater supplies are being mined as pumping rates exceed natural recharge rates. In some areas, groundwater resources cannot satisfy existing agricultural, domestic, urban and environmental needs during mild drought conditions.

¹ Texas Water Development Board, Texas Water Facts, Austin. (1991), p. 9.

² *Id.*

³ Texas Water Development Board, Water for Texas-Today and Tomorrow, Austin. (1990), pp. 1-3.

While past management practices centered around development of new sources, today's policies focus on conservation, reuse and reallocation of existing supplies.⁴ This shift began in 1984 when the Department of Water Resources identified conservation as one way to address the future demand for water.⁵ In 1985, the Texas Legislature mandated that political subdivisions receiving water development funds from the State be required to set up conservation programs.⁶ As part of that legislative emphasis, the Texas Water Commission, now the Texas Natural Resources Conservation Commission (hereinafter the Commission), was given the authority to require preparation of a water conservation plans as part of the water right permit process.⁷ This effort has resulted in significant steps toward resolving the uncertainty over future water needs. Forecasts in the 1990 Water for Texas Plan suggest that increases in water use efficiency and conservation could reduce municipal water use by 21 percent and agricultural water use by nearly 40 percent by the year 2020.⁸ The realized savings from conservation practices raised questions over how this water should be reallocated.

Reallocation questions are not restricted to conserved water. Urban growth, industrial and tourism development, environmental, and recreation concerns are creating pressures for the reallocation of water rights from lower-valued to higher

⁴ *Id.* pp. 2-6 to 2-16 and 4-1. The 1990 State Water Plan, in addition to incorporating conservation and reuse strategies for meeting water needs, continues to recommend new source supplies. The Plan also examines other water supply source alternatives, such as water supply yield enhancement, desalination and conjunctive use.

⁵ See Texas Department of Water Resources, Water for Texas, Vol. 1 (GP-4-1), Austin. (1984), pp. 57-59.

⁶ The Texas Legislature, conditioned on the adoption of constitutional amendments authorizing bonds, made conservation a factor in planning decisions. See House Joint Resolution No. 6, 69th Leg. §§ 1 and 2, Act of May 8, 1985. Both sections were approved in a general election in November, 1985.

⁷ Tex. Water Code § 11.134(4).

⁸ Texas Water Development Board, Water for Texas, 1990, Austin, (1990), pp. 2-6 to 2-10.

valued uses. Transfers of water from agricultural to municipal uses account for the vast majority of water rights transfers in Texas.⁹ Given that agricultural uses account for about 70 percent of total water use in the state and that future growth is toward urban areas, many of the important reallocation issues will involve the movement of water from agriculture to urban uses.

While there is general agreement that reallocation of water rights is ultimately necessary, there is little agreement on the best way to accomplish this goal. Two basic methods are generally advanced. Reallocation can be achieved through (1) a public administrative system; or (2) some form of public or private water marketing. The 1990 Water Plan points out that Texas does not have a formal or effective mechanism to promote water transfers or reallocation to more efficient uses. The Plan recommends that the Texas Water Development Board begin a comprehensive review of State water law and regulations to identify restrictions on water transfers and to recommend any statutory clarification which will encourage voluntary water marketing and transfers.

Finding answers to the problems of increasing demands, limited supplies, and shifts in use may require modifications in Texas water laws and institutions. Most existing law and institutions were created during the era of water development, before reallocation and conservation became issues of importance. These allocation paradigms, emphasizing the regulatory approach, will not be adequate to deal with reallocation issues. Regulatory paradigms will have to be combined with water marketing mechanisms in order to achieve the efficiency and

⁹ See Schoolmaster, A., Water Marketing and Water Rights Transfers in the Lower Rio Grande Valley, Texas, 43 *Professional Geographer*, 292 (1991); Chang, C., & Griffin, R., Water Marketing as a Reallocative Institution in Texas, 28 *Water Resources Research* 879 (1992).

equity goals of the public trust doctrine.¹⁰ An economist's idealized vision of reallocating water based on a "free market," unfettered by government, must be tempered with public trust considerations. Water reallocation cannot be based only on mathematical economic models; it must also consider existing legal rules and institutions.

In this report, the laws necessary to reallocate water under a market based regulatory paradigm will be examined. Specific objectives for the report include:

- (1) a review of Texas water law, regulations and institutions to identify the potential for and constraints on water reallocations through marketing systems;
- (2) an identification of the criteria and values to be achieved by a water transfer system;
- (3) an evaluation of policy statements, institutional structures and legal authorities found in other western states that have carried out water reallocation and marketing systems;
- (4) a review of strategies and justifications used in various allocation methods to reallocate water considering economic, environmental, institutional and legal constraints; and
- (5) recommendations to facilitate water transfers using a marketing approach.

¹⁰ Public trust law originated from concepts in Roman and English common law which the courts have used to protect the public's interest in property owned by the state in trust for the people. The doctrine has been applied to public rights in rivers, the sea, and the seashore and is used to protect public rights in navigation, commerce and fisheries. In more recent court decisions, the public trust concept has been expanded to protect other public property and other uses of waters such as hunting, fishing, swimming, recreational boating, environmental and ecological quality and water allocation. See Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 *Michigan Law Review* 473 (1970); Osborne, *Judicial Protection of Water Resources: Private Action, The Public Trust Doctrine, and Administrative Review*, 48 *Texas Law Review* 1169 (1970); Weaver, *The Public Trust Doctrine and Texas Water Rights Administration: Common Law Protection for Texas Bays and Estuaries*, 15(2) *State Bar of Texas Environmental Law Journal* 1 (1985); Kaiser, R. & Kelly, S. *Water Rights for Texas Estuaries*, 18 *Texas Tech Law Review* 1121 (1987).

Water use in Texas, as in other western states, is regulated under prior appropriation statutes designed to achieve broad public benefits while encouraging private development. The following discussion briefly outlines the role of law in the Texas water allocation process .

II. AN OVERVIEW OF TEXAS WATER LAW
1. CLASSES OF TEXAS WATERS

In Texas, the container for the water determines the rule of law to apply. Rather than treating water as hydrologically interconnected, Texas law recognizes four distinct classes of water:

- (1) natural surface water;
- (2) diffused surface water;
- (3) percolating groundwater; and
- (4) underground streams.¹¹

These classes are important because different allocation rules, dispute resolution paradigms and agencies have evolved for each class of water. While this report will deal with natural surface waters it is important to briefly recognize the other classes.

A. Natural Surface Waters

Generally, all natural surface waters in Texas are owned by the state and are held in trust for the people.¹² These waters include the ordinary flow, underflow and tides of every flowing natural watercourse in the state (a watercourse has a definite bed and banks). Stormwater and floodwater found within natural lakes, rivers and streams are also state waters¹³ as are springs that form headwaters of natural streams.¹⁴

¹¹ Kaiser, R., Handbook of Texas Water Law. College Station: Texas Water Resources Institute, (1987) p. 6.

¹² Tex. Water Code, § 11.021.

¹³ *Id.*

¹⁴ *Fleming v. Davis*, 37 Tex. 173 (1872).

B. Diffused Surface Waters

Water that does not flow in any defined watercourse, but flows across the surface of land in a variant and unpatterned way is termed diffused surface water. Generally, this is rain or snow runoff, although water left in upland areas after a flood recedes may also qualify as diffused surface water. Diffused surface waters are the property of the landowner,¹⁵ until they enter a natural water course.¹⁶ When these waters flow into a natural water course they become state water subject to state allocation and control.

C. Percolating Groundwater

This is water beneath the land surface which fills the pore spaces of rock and soil material and which supplies wells and springs. Artesian wells are considered groundwater.¹⁷ From a legal principle, Texas groundwater law is relatively simple and straightforward. Groundwater is the property of the owner of the surface estate. In a practical sense, the surface owner does not own the water but only has a right to pump it and capture whatever water is available, regardless of the effect of pumpage on neighboring wells. New Hampshire is the only other state which abides solely by the rule of absolute ownership for groundwater. This rule is generally regarded as regressive, being based on an outdated understanding of groundwater hydrology. This rule of capture is absolute, unless one of a number of exceptions apply. The regulatory exceptions incorporated in the Edwards Aquifer Legislation¹⁸ and in

¹⁵ For purposes of pollution control "all water in the state" is subject to police power regulation. See Tex. Water Code §§ 26.001 & 26.121.

¹⁶ See *Hoefs v. Short*, 273 S.W.2d 785 (1925); *Turner v. Big Lake Oil Co.*, 96 S.W.2d 221 (1936); *In re Water Rights of Lower Guadalupe River Segment, Guadalupe Basin and a Portion of the Lavaca-Guadalupe Coastal Basin (Green Lake)*, 730 S.W.2d 64 (Tex. App.--Corpus Christi 1987, writ ref'd n.r.e.)

¹⁷ See *Denis v. Kickapoo Land Company*, 771 S.W.2d 235 (Ct. App.- Austin, 1989, no writ history)

¹⁸ SB 1477, May 30, 1993.

underground water conservation districts¹⁹ represent the most important constraint on the capture rule. Other limitations include the underground river exception²⁰, the underflow of a surface watercourse rule,²¹ malicious pumping²² and the subsidence exception.²³

D. Underground Streams

Courts have suggested in dicta that subterranean streams may be property of the state of Texas and may be governed by surface water rules.²⁴ To meet the definition of an underground river, the aquifer containing the water would have to include confining bed and banks. Not only are these conditions very rare, they are difficult to establish. However the rule has appeal for two reasons. First, it could for certain bodies of groundwater in the State, consolidate surface and groundwater into a single regulatory framework thus offering the appeal of some simplicity. The second reason for the appeal of underground stream classification stems from the need to enact some kind of regulatory management scheme for groundwater, even an imperfect one. In a state such as Texas, where property rights extend to groundwater and where groundwater is so firmly embedded in agricultural roots, moves to enact needed groundwater management legislation have been notoriously unsuccessful.

¹⁹ See Tex. Water Code, Chapter 52, subch B & C.

²⁰ See Texas Co. v. Burkett, 296 S.W.2d 273 (1927); Pecos County SWCID No. 1 v. Williams, 271 S.W.2d 503 (1954); and Denis v. Kickapoo Land Co. 771 S.W.2d 235 (1989).

²¹ Tex. Water Code, § 11.021

²² City of Corpus Christi v. City of Pleasanton, 276 S.W.2d 798 (1955).

²³ Friendswood Development Co. v. Smith-Southwest Industries Inc., 576 S.W.2d 21 (Tex 1978).

²⁴ See Texas Co. v. Burkett, 296 S.W. 273 (1927) and Denis v. Kickapoo land Co., 771 S.W.2d 235 (Ct App--Austin, 1989, no writ history).

2. SURFACE WATER LAW--FOUR DIVERGENT REGIMES

The history of Texas is embodied in its water laws which reflect a confluence of waters, nations, and cultures.²⁵ Texas water law has been influenced by Spanish, Mexican, and English legal systems and is patterned after the laws of other western states. Each of these influences has made a particular contribution to the water rights system that we have today. Water laws and rights created by Spanish and Mexican land grants are recognized and protected by Texas even though they diverged from English common law and from the prior appropriation water rights system.²⁶ For a chronological history of Texas water law see Table 1-1.

While these legal systems have added richness to the Texas heritage, they have also created complications in determining the rights created under these different legal regimes. As a general principle, the property rights granted from former sovereigns (Spain & Mexico) vested at the time of the original grant and are recognized and protected under Texas law. This simple statement belies a deeper problem--just what was the law of that sovereign at the time the right was granted. To answer that question, Texas courts must interpret the law of Spain and Mexico that existed at the time of the grant. The following discussion summarizes some of these rules and their possible outcomes.

A. Civil Law of Spain & Mexico

Land titles granted by Spain or Mexico may carry with them certain water rights dating from the time of the original grant. The water rights of property owners originally granted under civil law are determined by reference to the laws of Mexico or Spanish colonial law. These rights are recognized in statutes and protected by Texas courts. If vested, these rights carry priority dates that predate the appropriation system and are therefore the most senior of all water rights.

²⁵ For a history of Texas water law see Hutchins, W., The Law of Texas Water Rights, Department of Water Resources: Austin, (1961); Baade, The Historical Background of Texas Water Law--A Tribute to Jack Pope, 18 *St. Mary's Law Journal* 1 (1986).

²⁶ See *State v. Valmont Plantations*, 355 S.W.2d 502 (1962).

1. *Appurtenant Riparian Rights.* These are rights that accrue to the landowner based on a river flowing through or adjacent to the property. If the original Spanish or Mexican land grant made during the colonization of Texas does not mention water rights they cannot be implied from the laws of these two sovereigns.²⁷ Only those water rights expressly included in the grant will be recognized and enforced.²⁸

Landowner water rights on non-perennial streams (streams that do not have a year around natural flow) follow the same rule. The Texas Supreme Court has ruled that a water right cannot be implied under Spanish law by simply having a stream flow through the property. A landowner may only have a water right on the non-perennial stream if the original land grant expressly recognizes a water right.

2. *Titles to River Beds.* Title to the beds of navigable streams becomes an important issue in resolving the ownership of minerals found in or under the bed. As a general rule, the minerals belong to the owner of the riverbed. Texas, Spanish and Mexican water law all concur that the river beds of navigable streams belongs to the sovereign. However, under Spanish and Mexican law the title to abandoned riverbeds and to the beds of non-perennial streams may be held by the appurtenant landowner and not the state.²⁹

²⁷ State v. Valmont Plantations, 355 S.W.2d 502 (1962).

²⁸ If water rights under a Spanish or Mexican land grant are expressly stated in the grant then the landowner has a right to the natural flow from the stream. In San Antonio River Authority v. Lewis, 363 S.W.2D 44 (Tex. 1964) the court held that Lewis had a vested right to water that included the right to the flow in a natural channel. The court held that the Authority must compensate the landowner for damages caused by their moving the river channel some 200 feet away from its natural course.

²⁹ See Manry v. Robinson, 56 S.W.2d 438 (Tex. 1932) and McCurdy v. Morgan., 265 S.W.2d 269 (Tex. Civ. App--San Antonio 1954, writ ref'd).

TABLE 1-1. EVOLUTION OF TEXAS SURFACE WATER RIGHTS REGIMES

Sovereign	Date	Water Rights Regime
Spain	1600-1821	Spanish Civil Law
Mexico	1821-1835	Mexican Civil Law
Republic of Texas	1836-1840	Presumably Riparian
	1840-1845	Riparian Law
State of Texas	1845-1888	Riparian Law
	1889-1912	Limited Prior Appropriation and Riparian Law
	1913-1966	Mixed Prior Appropriation and Riparian
	1967-Present	Unified to Prior Appropriation

B. Riparian Water Law (English Common Law)

Further complicating the question of what water law to apply to any given dispute is the dual system of riparian and appropriative water rights adopted by the republic and the state of Texas. The English system for determining a person's right to use the surface waters in a natural stream is described as the "riparian water law doctrine."³⁰ Under riparian law, water rights on natural streams are determined according to land ownership with rights accruing only to the owner of land adjacent to the stream. The water right is inherent in the property and continues in full force even if the water is not used.

Under this doctrine, permission from the state to use water is unnecessary and neither the amount nor purpose of use is limited so long as it is reasonable. The rights held by riparian landowners include at least the following:

³⁰ The term "riparian" is derived from the Latin word *ripa* meaning the bank of a stream.

- (1) the right to enjoy the natural amenity advantages of land adjacent to water;
- (2) the right of access to the water, including right to build a pier, dock or wharf out to navigable water;
- (3) the right to accretions or alluvium from the water; and
- (4) the right to make reasonable use of the water as it flows past the land including the right of consumption.³¹

Use of water under the riparian doctrine is measured by "reasonableness of the use" compared to all other uses.³² A riparian landowner is subject to liability for making an unreasonable use of water that causes harm to another riparian owner. Factors used to determine reasonableness of use include: (1) the purpose of use; (2) the suitability of the use to the characteristics of the river, stream or lake; (3) the economic value of the use; (4) the social value of the use; (5) the extent and amount of harm the use causes; (5) the practicality of avoiding the harm by adjusting the quantity of water used; (6) the protection of existing values of water uses, land, investments and enterprises; and (7) the equity of requiring the user causing the harm to bear the entire cost of the harm.³³

Riparian water rights attach to all lands patented by the state of Texas between 1840 and 1895.³⁴ Since the 1840 statute adopted the common law of England as the governing law in Texas, the English riparian water law became the governing rule in Texas after that date. In Texas, riparian water rights only attach to land adjacent to a natural or navigable watercourse. Waters that are subject to riparian use

³¹ Sax, J & R. Abrams, Legal Control of Water Resources (2nd ed), West Publishing Co., St. Paul, (1991), pp. 43-63.

³² Rhodes v. Whitehead, 27 Tex 304 (1863).

³³ RESTATEMENT (SECOND) OF TORTS § 850 (1977).

³⁴ The common law was adopted by the Republic of Texas in 1840 (See Tex Rev. Civ. Stat. art 1--Rep. Tex Laws 3 [1840]). The 1895 date was established by the 1913 Irrigation Act as the last upon which the state granted water rights with its land patents.

include only the ordinary flow and underflow of a watercourse, and not runoff or stormwaters.³⁵

C. Prior Appropriation (Statutory Water Rights)

A drought cycle in the late 1880's and early 1890's halted expansion in west Texas and imperiled the agricultural economy.³⁶ The riparian water doctrine was in effect but was ineffective in resolving allocation questions. Borrowing from the laws of Colorado and Utah, the Texas Legislature, in a series of statutes enacted in 1889, 1895 and 1913, adopted the prior appropriation doctrine. Thus, the development of the doctrine in Texas is based on legislation.³⁷

1. *1889 Irrigation Act*.³⁸ The primary purpose of this Act was to develop agricultural irrigation systems in the arid regions of west Texas. To accomplish this purpose all unappropriated waters of rivers and natural streams were declared to be property of the state and were available for appropriation on a "first in time, first in right" priority rule. An appropriation could be made by filing a sworn statement with the county clerk describing the diversion facilities and contemplated use of the water. The Act preserved riparian rights and started the state down the path of a dual water rights system that would not be resolved for more than 75 years.

2. *1895 Irrigation Act*.³⁹ This Act followed the basic pattern established 6 years earlier and was intended to extend and refine the initial appropriation process. State waters subject to appropriation were extended to include the ordinary

³⁵ *Motl v. Boyd*, 116 Tex. 578, 286 S.W. 458 (1926).

³⁶ Kaiser, Handbook of Texas Water Law, (1987), p. 19.

³⁷ For a succinct discussion of the statutory history see Skillern, F., Texas Water Law-- Vol 1, San Antonio: Sterling Press, (1993), pp. 36-41.

³⁸ Ch 88, 1889 Tex. Gen. Laws 100, 9 H. GAMMEL, LAWS OF TEXAS 1128 (1898).

³⁹ Ch 21, 1895 Tex. Gen. Laws 21, 10 H. GAMMEL, LAWS OF TEXAS 751 (1898).

flow, underflow, and storm water flow of natural rivers and the scope of coverage was expanded from "arid portions of the state" to portions of the state in which due to insufficient rainfall, irrigation is beneficial for agricultural purposes. The Legislature indicated that after 1895 any new water rights in these areas of the state could only be acquired by appropriation. However they did not abolish preexisting riparian water rights.⁴⁰

3. *1913 Irrigation Act: The Burges-Glasscock Act.*⁴¹ This Act made many changes in the existing system and was the precursor for many of the provisions found in the current Texas Water Code. Specifically, the major changes brought by the 1913 Act were:

- (a) Prior appropriation applied statewide--all unappropriated waters in the state, not simply those in arid west Texas, were the property of the state. Preexisting riparian rights were preserved but no riparian rights applied to lands acquired from the state after 1895.
- (b) State water agency--a Board of Water Engineers was established to plan for water development and administer a state-wide water permitting system.
- (c) Statewide water permits--a new permit process was established replacing the county clerk statement process. New appropriators were required to make a "certified filing" to obtain a water rights permit. This process allowed the state to keep track of water rights permits.

The Act prohibited unpermitted water diversions and interbasin transfers. It also provided for the loss of water rights if not beneficially used or if wilfully abandoned.

⁴⁰ See Skillern, Texas Water Law, Vol 1, (1993), p. 37.

⁴¹ Ch 171, 1913 Tex. Gen. Laws 211.

3. RECONCILING THESE CONFLICTING WATER LAW REGIMES

The prior appropriation doctrine, prevalent in the western United States, is the antithesis of riparianism in that appropriative water rights are not tied to adjoining land but are based on time, purpose, place, use and quantity restrictions. Unlike the riparian system with its unpredictable "reasonableness" criteria the appropriative system provides for "certainty, consistency and predictability" by specifying the amount of water that can be taken by each competing user on a time based seniority system.

Texas's dual system of riparian and prior appropriation rights presented few problems when sufficient water was available. However, during times of shortage it became difficult to determine and reconcile competing claims. Under the riparian regime, state permission to use water is not required and neither the amount nor purpose of use is limited so long as it is "reasonable." Not only are the allocation criteria of these regimes incompatible for determining "who and how much" is allocated during times of drought, but the process they use to answer these questions is different. The appropriation system is based on an administrative process for determining "who and how much," while the riparian doctrine is based on judicial process.

The incompatibility of these two regimes became manifestly apparent in a lawsuit involving the Rio Grande River.⁴² Because water rights claims based on civil law, riparian law and the prior appropriation system exceeded the amount of water available in the River during the drought of the 1950's, the state filed suit to have a court determine the efficacy of these competing water rights claims. The case took more than 13 years to be decided, involved about 3000 parties and generated an estimated \$10 million in court costs and attorneys fees.⁴³ This case illustrated that 78

⁴² State v. Hidalgo County WCID No 18, 443 S.W.2d 728 (Tex. Civ. App.--Corpus Christi 1969, writ ref'd n.r.e.).

⁴³ Caroom and Elliot, Water Rights Adjudication--Texas Style, November 1981 *Texas Bar Journal* 1183, 1184 (1981).

years of legislative and judicial attempts to reconcile the two systems was futile and that another approach was needed to manage water resources in Texas.

In 1967, the Texas Legislature merged the riparian water law regime into the prior appropriation system with the passage of the Water Rights Adjudication Act.⁴⁴ The Act required all riparians and unrecorded users of water to file their claims with the Texas Water Commission (now the Texas Natural Resources Conservation Commission) by 1969. Those claims had to be based on the actual beneficial use during the years of 1963 to 1967. The Commission has now worked its way down all the rivers and determined the nature and extent of all claimed water rights. Today, anyone seeking a permit to use state surface water must comply with the unified procedures contained in the Water Code.

III. WATER RIGHTS UNDER THE PRESENT SYSTEM

1. WATERS SUBJECT TO APPROPRIATION

In 1982 and again in 1988 the Texas Supreme Court affirmed that the Water Rights Adjudication Act provides the exclusive means by which appropriative water rights may be recognized and reconciled with other competing rights.⁴⁵ Thus water rights are governed by a statutory and administrative rule scheme. This section deals with the salient provisions of appropriative rights under the Texas Water Code.

A. Natural Surface Water

Under the Water Code, 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 . . ."⁴⁶

⁴⁴ Tex. Water Code §§ 11.021 *et. seq.*

⁴⁵ *In re Adjudication of Water Rights of the Upper Guadalupe Segment*, 642 S.W.2d 438 (Tex. 1982) and *In re Adjudication of Water Rights of Brazos III Segment*, 746 S.W.2d 207 (Tex. 1988).

⁴⁶ Tex. Water Code § 11.021.

This statutory definition encompasses waters in navigable rivers⁴⁷ and natural streams⁴⁸ including non-perennial streams⁴⁹ and surface water run off in ravines, canyons, ponds, and lakes.⁵⁰ Waters imported into the state and put in natural watercourses are also considered property of the state and are subject to appropriation.⁵¹

B. Natural Surface Waters Exempt from the Permit Process

Aside from the groundwater and diffused surface water exclusions, the Water Code and the courts have taken a liberal and expansive interpretation of the surface waters subject to the permit and adjudication process. Very few exemptions have been created to the permit requirements. Two noteworthy exemptions are for stock tank and for salt water uses.

1. *Stock-Tank Uses.* One exemption to the permit requirement is given to persons constructing small reservoirs (stock tanks) on non-navigable streams on their own property. A landowner may build a reservoir, holding up to 200 acre-feet of water, for domestic and livestock purposes without obtaining a permit.⁵² However, a permit is required for any reservoir constructed on a navigable watercourse, regardless of the size or quantity or purpose. If the landowner seeks to use the water in either type of stream reservoir for any other

⁴⁷ Navigable rivers are watercourses that average 30 feet in width from cut bank to cut bank. See Tex. Nat. Resources Code § 21.001

⁴⁸ A natural stream must have an identifiable bed and banks. *Hoefs v. Short* 273 S.W. 785 (1925).

⁴⁹ Streams which do not have a regular or predictable flow.

⁵⁰ See *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).

⁵¹ See Tex. Water Code § 11.021(b).

⁵² Tex. Water Code § 11.142.

purpose than originally contemplated, a permit is required.

2. Salt Water Uses. Two uses of salt water from the Gulf of Mexico and adjacent coastal waters are authorized without obtaining a permit. Persons engaged in oil and gas production are allowed to use up to one acre-foot of water per 24-hour period without obtaining a permit.⁵³ Water usage beyond that amount requires a permit. In 1987 an exemption was established for water used in land-based mariculture operations.⁵⁴ While mariculture appropriators must notify the Commission, they do not have to seek a permit nor do they have numerical limits placed on the amount of water they can use.⁵⁵

2. WATERS EXEMPT FROM STATE APPROPRIATION

A. Diffused Surface Waters

Water that does not flow in any defined watercourse, but flows across the surface of land in a variant and unpatterned way is termed diffused surface water. Generally, this is rain or snow runoff, although water left in upland areas after a flood recedes may also qualify as diffused surface water. Diffused surface waters are the property of the landowner⁵⁶, until they enter a natural water course.⁵⁷ When

⁵³ *Id.* § 11.142(b).

⁵⁴ *Id.* § 11.1421(b). Mariculture is the propagation and rearing of aquatic species in a controlled environment using brackish or marine water. *Id.* § 11.1421(a).

⁵⁵ The Commission may limit the amount of water that can be taken if it finds that mariculture appropriations reduce fresh water inflows so as to interfere with bay and estuary productivity. *Id.* §11.1421(c)-(e).

⁵⁶ For purposes of pollution control "all water in the state" is subject to police power regulation. See Tex. Water Code §§ 26.001 & 26.121.

⁵⁷ See *Hoefs v. Short*, 273 S.W.2d 785 (1925); *Turner v. Big Lake Oil Co.*, 96 S.W.2d 221 (1936); *In re Water Rights of Lower Guadalupe River Segment, Guadalupe Basin and a Portion of the Lavaca-Guadalupe Coastal Basin (Green Lake)*, 730 S.W.2d 64 (Tex. App.--Corpus Christi 1987, *writ ref'd n.r.e.*).

The Texas Natural Resource Conservation Commission defines diffused surface waters as surface water other than in watercourses and flowing vagrantly over broad areas coming to rest in natural depressions, playa lakes, bogs, or marshes whose duration is short lived. See 31 Tex. Admin. Code §§ 297.1, 301.71.

these waters flow into a natural water course they become state water subject to state allocation and control.

B. Percolating Groundwater

Texas follows the absolute ownership rule making groundwater the property of the owner of the surface estate. In a practical sense, the surface owner does not own the water, but only has a right to pump it and capture whatever water is available and, except for the regulatory programs of local underground water conservation districts, surface water laws and administrative rules do not apply to groundwater.⁵⁸ Moreover, the Water Rights Adjudication Act is inapplicable to groundwater.⁵⁹ As far as ownership is concerned, groundwater is the property of the surface owner who has a right to capture whatever water is available, except that the underflow of a watercourse (that portion of the surface flow present in sand and gravel deposits beneath the bed of the stream) and underground streams are subject to state ownership and control.

3. NATURE OF APPROPRIATIVE RIGHTS

Title to surface water in Texas is held in trust by the state. A holder (appropriator) of a water right 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 which entitles the appropriator to certain protection against termination⁶⁰, loss⁶¹ or infringement.⁶² A vested right however is subject to regulation by the state under

⁵⁸ Tex. Water Code § 52.003.

⁵⁹ *Id.* § 11.339.

⁶⁰ A vested water rights requires that compensation be paid if it is condemned in appropriate proceedings. See Tex. Water Code §11.033 (eminent domain).

⁶¹ For loss of rights through cancellation proceedings see generally Texas Water Code § 11.172.

⁶² Interfering with or impairing a water right without improper authority is unlawful. See generally Tex. Water Code §§ 11.081-.083.

its police powers. In granting a vested right the Commission may place restrictions and conditions on that right in order to protect the priority of seniority water rights or environmental values.⁶³

A. Priority Rule

Priority 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. During times of plenty the priority rule has limited utility but when shortages occur, the priority rule becomes very important for resolving disputes.

To implement this rule, all appropriators are ranked according to their date of appropriation. An appropriator with an earlier priority date is known as the senior appropriator when compared to a later appropriator who is junior. When there is not enough water for both senior and junior appropriators, the doctrine of priority allows the senior to exercise all rights before the junior can use any water.

For water permits today, the priority date is established as of the date the complete application is filed with the Commission. Before the permit process came into existence, the priority date depended on when the "first step" to appropriate water was taken. If the first step was combined with an intent to appropriate and with the diligent pursuit of diversion, the priority date related back to the date of the first step. Disputes about the dating of water rights are rare but could arise if the water right antedates the permit system, if permits are transferred following a marketing approach, or if shortages occur.

Two significant exceptions to the priority rule exist in the Water Code. Both may have significance in times of drought but in reality will have little impact on Texas water uses.

1. Municipal Use Exception. In order to assure future water supplies for cities the Texas legislature enacted the Wagstaff Act. This Act gives municipalities a superior priority claim over any other water use with a priority date after 1931 thereby creating an exception for cities from the "first in time, first in

⁶³ See Tex. Water Code §§ 11.147, 11.150, 11.152.

right doctrine." All water appropriations granted after 1931 are subject to the right of any city, town or municipality of this state to make further appropriations of that water without the necessity of condemnation or payment.⁶⁴ Because of the highly political nature involved in the exercise of this right it has been rarely invoked and its constitutionality remains untested. In spite of these issues, it remains a viable tool for municipalities to use during times of drought.

2. *Domestic and Livestock Use Exception.* Under the Water Rights Adjudication Act, users of water for domestic and livestock purposes did not have to file claims for the use of that water. As such, those rights, whether based on civil law, riparian law, or early appropriative rights, are not barred by the provisions of the Act and would predate most appropriation rights.⁶⁵

B. Vested Rights

The Texas Water Code recognizes two types of vested water rights—those based on Certifications of Adjudication issued under the Water Rights Adjudication Act and those based on a permit from the Commission. The former include those rights existing prior to 1967 and the latter are for those rights after 1967. Under the former, any water rights arising from civil law, riparian law or appropriation statutes,⁶⁶ not claimed by 1967, were extinguished. Thus, the water permit process of the Commission is currently the primary source of new water rights.

In order to divert, use, store or transfer state water, a permit must be obtained from the Commission. In addition to the regular permit the Commission may issue a more restrictive permit such as, a seasonal permit, a term permit, a temporary permit, a emergency permit, or a bed and banks permit. Further, the Code directs

⁶⁴ Tex. Water Code § 11.028

⁶⁵ Skilleen, Texas Water Law -Vol 1., (1993), p. 72.

⁶⁶ Prior appropriation statutes refer to the 1889 and 1895 Irrigation Acts and the certified filings under the 1913 Burges-Glasscock Act

that transfers or amendments to water rights be approved by the Commission.⁶⁷ When these statutory transfers affect existing water rights, notice and public hearings are required.⁶⁸

1. *Regular Permit.* This permit,⁶⁹ issued for an indefinite duration, covers appropriations for storing, taking or diverting state water. Since it is the least restrictive permit, greater project detail is required in the application process.

2. *Seasonal Permit.* The right to take, use or divert water is limited to a specified portion or portions of the calendar year. These permits are typically issued for irrigation purposes or to fill off channel reservoirs during the wet season.

3. *Term Permit.* In 1987, the Texas Legislature authorized the Commission to issue term permits.⁷⁰ These permits may be issued for up to 10 years and are subject to renewal at expiration of that term with the retention of the original priority date.⁷¹ The perceived advantages of term permits are the increased flexibility in the allocation of water by allowing for periodic evaluation of water uses and needs, the promotion of conservation and beneficial use, and the ability of the state to retain control of supplies until environmental demands for water can be documented. In practice, the Commission allows term permits where a source of supply does not have adequate water on a permanent basis, but because the existing water supply is currently underutilized, does have adequate water on a limited basis.⁷²

⁶⁷ See Tex. Water Code § 11.122 and 11.132.

⁶⁸ See 31 Tex. Admin. Code § 295.158.

⁶⁹ Tex. Water Code § 11.121

⁷⁰ *Id.* § 11.1381. The purported purpose of the term permit is to allow maximum use of state water until a water right is perfected under § 11.026.

⁷¹ By TNRCC policy the time period is 10 years.

⁷² See 31 Tex. Admin Code § 297.19.

In reality, the term permit is a great idea with a poor sense of timing. Since the permit only applies to new water users (in Texas most of the water is already appropriated), the amount of water subject to reevaluation is insignificant. Another major disadvantage of term permits is the negative impact on a water users ability to finance long-term improvements. Many improvements must be amortized over a 20-30 year time frame and a shorter term permit makes financing generally infeasible.

4. *Temporary Permit.* These permits⁷³ are for a duration of three (3) years or less and are primarily intended for highway construction and oil and gas projects.⁷⁴ Since these permits are for a short time period and for a limited purpose they are often issued without the necessity of a public hearing.

5. *Emergency Permit.* The Commission may grant this type of permit for the diversion and use of water for a period of not more than 30 days.⁷⁵ Prior to issuing an emergency permit, the Commission must find that conditions exist which threaten the public health, safety and welfare to the extent that the necessity to comply with established permit procedures is overridden.

6. *Bed and Banks Permit.* In order to deliver water from a source of supply to a place of use, the Commission may authorize any person to convey water using the bed and bank of any flowing natural stream.⁷⁶ This type of permit may facilitate the development of water markets because it grants permission to use a river as a conveyance system in the transfer of water or water rights.

⁷³ Tex. Water Code § 11.138.

⁷⁴ Tex. Admin. Code § 297.13

⁷⁵ Tex. Water Code § 11.139.

⁷⁶ *Id.* §11.042

C. 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 works and land development by assuring them of a fixed water supply in times of drought. Those quantities are not absolutely guaranteed but are limited to the amount of water beneficially used. For example, if an appropriator by permit is entitled to 100 acre-feet per year of water but only needs 50 acre-feet per year (beneficial use amount) the excess is considered unappropriated and this surplus is theoretically subject to cancellation by the Commission.⁷⁷

D. Transferability

Since it is a vested property right, an appropriative water right is transferable to other users or uses. This feature allows for the transfer of water rights using a market mechanism. All transfers require approval by the Commission, however, transfers resulting in minimal changes may be granted without notice or a hearing.⁷⁸ The transferability concept will be discussed more extensively in a later section of this Report.

E. Recapture & Reuse of Appropriated Waters

Often the amount of water diverted by an appropriator is greater than the water actually consumed. The waters not actually used are usually termed waste water, seepage water, drainage water or return flows,⁷⁹ and result from transit losses

⁷⁷ *Id.* §§ 11.025 & 11.046.

⁷⁸ *Id.* § 11.122 & 11.085 applying the no injury rule to interbasin transfers.

⁷⁹ See Skillern, Texas Water Law, Vol 1. (1993), p. 78. *Waste water* is that water lost in transit through evaporation, percolation, seepage or excess application to the soil. *Seepage water* is that water moving through the soil from irrigated lands, ditches or other structures into natural streams or emerging on the land surface as seeps or springs. *Drainage water* is that water from an artificial or natural source flowing in an artificial drain. *Return water* is that water diverted from a watercourse for beneficial use that would, if not impeded naturally return either to the original source or to another natural stream. It would include waste, drainage, seepage and developed waters.

(leaky ditches, pipes and canals) or from water use practices (flooding land for irrigation purposes). An issue arises when an appropriator seeks to reclaim and reuse these "unconsumed waters." Resolution of an appropriator's right of recapture turns on where the recapture took place and how the waters are to be classified.

Although the general rule is that an appropriator can recapture and reuse "surplus and waste water," so long as it is done on the original land and for the same purpose as the original appropriation,⁸⁰ there is some murkiness about its acceptance by the Commission.⁸¹ As soon as the water leaves the appropriators land, or if the water would naturally flow unimpeded into a natural watercourse, it becomes state water available for reappropriation.⁸²

IV. LOSS OF WATER RIGHTS

A vested appropriative water right is exclusive in terms of a fixed amount of water and time priority for the right. This statement embodies two dominant themes in the appropriation doctrine; (1) the goal of full beneficial use of water, and (2) the need to vest water rights holders with certainty, consistency and predictability as to the entitlement to and value of the water. That is not to say that a vested right is absolute and cannot be lost. A vested right may be limited by time (see term permits in Texas), or it may be lost through non-use or through violation of other statutory conditions. The following section examines the classic ways in which a vested right may be lost and become available for reallocation to other users and uses.

⁸⁰ See *Guelker v. Hidalgo County WCID No. 6*, 269 S.W.2d 551, 555 (Tex. Civ. App.--San Antonio 1954, writ ref'd n.r.e.).

⁸¹ Commission rules require that return flow and surplus water be returned to the source of supply. 31 Tex. Admin. Code § 297.45.

⁸² *South Texas Water Co. v. Bieri*, 247 S.W.2d 268, 272-273 (Tex. Civ. App.--Galveston 1952, writ ref'd n.r.e.).

1. ABANDONMENT

A vested water right may be lost if it is voluntarily relinquished or abandoned. Common law abandonment is a concept that requires proof of intent to relinquish dominion and control over a vested water right coupled with nonuse of water. Mere nonuse is not sufficient to show abandonment. The burden of proving an intent to abandon is placed on the person attempting to establish abandonment. Texas recognizes that a vested water right may be lost through abandonment.⁸³

2. CANCELLATION/FORFEITURE

Cancellation, unlike abandonment, does not require that the appropriator intend to abandon a water right by mere nonuse. All that is required is mere nonuse for a certain period of time. In Texas, cancellation of a water right may be undertaken based on mere nonuse of water or on the failure to use water beneficially.⁸⁴ The Texas Water Code authorizes the Commission, on its own motion, or at the request of others, to initiate action to cancel uses where water has not been applied to a beneficial use for ten (10) consecutive years.⁸⁵

3. RELUCTANCE TO USE

An action to take away an existing water right is rife with political controversy for state water agencies. While the abandonment and cancellation doctrines have legal efficacy they have not been used to reallocate a substantial amount of water. They have been used as a tool to correct abusive water rights practices. In some instances, cancellation of water rights can be used to encourage the voluntary transfers of water rights through water marketing.⁸⁶

⁸³ See *City of Anson v. Arnett*, 250 S.W.2d 450 (Tex. Civ. App. 1952, writ ref'd n.r.e.).

⁸⁴ *Id.* See also *Texas Water Rights Commission v. Wright*, 464 S.W.2d 642 (1971).

⁸⁵ *Id.*

⁸⁶ See Jensen, R., *The Texas Water Market*, 13(2) *Texas Water Resources* 4 (Spring 1987).

CHAPTER ONE SUMMARY

There has generally been sufficient unappropriated surface water, or groundwater to meet the diverse needs of the people of Texas. However, with groundwater supplies being depleted and surface waters almost fully appropriated, Texas water management practices must shift from development of new sources to conservation and reallocation of existing sources. One way to reallocate water is through a market based transfer system. However, the existing laws and institutions of this State may, in some cases, work to inhibit water markets.

Although water use in Texas is now regulated under the prior appropriation doctrine four different water law regimes have contributed to the current laws/regulations. These are Spanish and Mexican civil law, the English common law riparian doctrine and the western states prior appropriation doctrine. Spanish and Mexican laws applied to land grants made in the state while it was owned by those governments. After becoming a republic and then a state Texas adopted the English Common law riparian doctrine. This water law system guided water use until the late nineteenth century when a drought caused the State to shift to the prior appropriation system.

The incompatibility of the riparian and prior appropriations systems became evident in the the 1950's Rio Grande water disputes. With the passage of The Water Rights Adjudication Act in 1967 Texas finally consolidated all water rights into the prior appropriation doctrine. Under this rule, all natural surface waters are owned by the State and require a permit for use. Water permit holders have a right to use quantified amount of water based on a time based seniority system.

CHAPTER II. MEETING WATER NEEDS THROUGH REALLOCATION OF EXISTING SUPPLIES

Western water law has moved from the era of project development to conservation and reallocation as a means of meeting new and increasing urban and environmental demands for water. Reallocation of water rights from existing to new uses is one of the most debated subjects in water law. While the use of reallocation varies from state to state it is generally viewed as a method of promoting public interest values by supplying the water needs for growing urban areas without draining rivers of their remaining water or building new and environmentally damaging water projects.

Reallocation can occur either through voluntary or involuntary means. Involuntary transfers generally occur through abandonment, forfeiture, prescription or eminent domain. Voluntary transfers refer to the conveyance of a water right from one user to another, or to a change in the location, or purpose of use by the holder of an appropriative water right. Many studies and commentators suggest that transferability of a water rights promotes the public interest by allowing established uses to change in accordance with changing societal conditions, needs and values.⁸⁷ They suggest that transfers allow water to be allocated at the lowest transaction cost and in the least politically and economically disruptive manner.

While much has been written over the past decade on voluntary water reallocations this concept is not new. As early as 1859, California recognized that an appropriative right could be transferred.⁸⁸ Colorado and Wyoming have allowed

⁸⁷ Two recent law review symposia were devoted to water transfers: *Water Transfer Symposium*, 31 *Ariz. Law Rev.* 697-904 (1989) and *New Challenges to Western Water Law*, 29 *Natural Resources Journal* 327-592 (1989). Other interesting studies of water transfers include Saliba and Bush, *Water Markets in Theory and Practice*, Boulder: Westview Press, (1987); National Research Council, *Water Transfers in the West*, Washington, D.C.: National Academy Press, (1992). MacDonnel, L. (ed) *The Water Transfer Process as A Management Option for Meeting Changing Water Demands*, U.S. Geological Survey, (1990); Morandi, L., *Reallocating Western Water: Equity, Efficiency, and the Role of Legislation*, National Conference of State Legislatures, (1988).

⁸⁸ *McDonald v. Bear River Co.*, 13 Cal. 220, 232-33 (1859).

water transfers for more than 100 years.⁸⁹ In Texas, the authority for voluntary transfers dates back to at least the 1917 Conservation Amendment to the Constitution.⁹⁰ Given that Texas water transfers have been authorized for more than 75 years, the question can be asked--why the sudden interest in water transfers? The answer(s) to that question lies in the changing conditions in Texas and in the West.

I. PRESSURES FOR CHANGE

The heightened interest in the reallocation of water results from a number of factors not the least of which is the decline in the use of water for agricultural irrigation. Thus, agricultural stakeholders are directly impacted by this trend and favor the reallocation of water through voluntary transfers. Other factors contributing to the pressure to change include demographics, economics, environmental and fiscal issues. Planning documents suggest that the Southwest, and in particular Texas, will not have enough water to meet future long term demands.⁹¹ There is increasing consensus that new demands must be met through the reallocation of existing supplies or through conservation practices.⁹²

⁸⁹ See, e.g. *Strickler v. City of Colorado Springs*, 26 P. 313 (Colo. 1891); *Johnston v. Little Horse Creek Irrigation Co.*, 79 P. 22 (Wyo, 1904).

⁹⁰ See *Clark v. Briscoe Irrigation District*, 200 S.W.2d 674 (Tex Civ. App--1947).

⁹¹ According to population projections in "Water for Texas" (1990) the State will not have enough water to meet long term demands unless its conservation goals are achieved and some additional supplies are developed to supplement current ground and surface water supplies. Even if total water use is reduced to correspond to available supply, some areas of the State will experience water shortages. On a statewide basis, Texas faces a water distribution rather than a shortage problem. Office of the State Auditor, Texas Water Resource Management: A Critical Review, Austin Texas, SAO Report # 3-081 (March 1993).

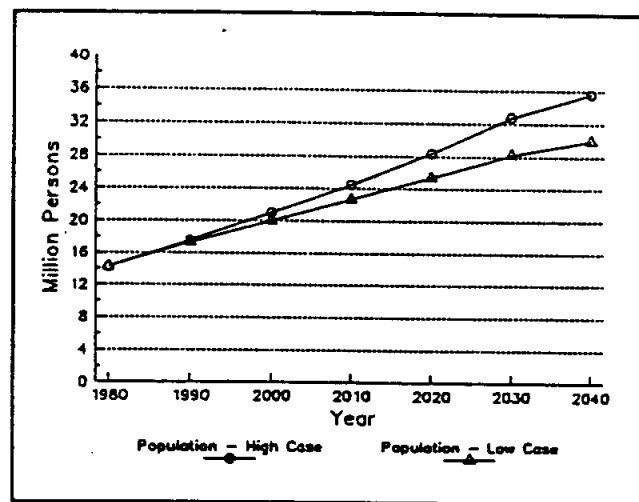
⁹² National Research Council. Water Transfers in the West. (1992), p. 16.

1. DEMOGRAPHIC CHANGES

All of the western States, including Texas, have experienced population growth rates substantially higher than the national figure of 8.5 percent for the 1980-90 time period. The Texas Water Development Board's population projections suggest that this growth pattern will continue for the next two to three decades. As shown in Figure 2-1, the Texas growth rate is expected to double in the next fifty years, from 17.5 million in 1990 to 35 million in 2040.

Population growth is not projected to be uniform throughout the State but will be concentrated in urban areas with the large metropolitan areas expected to have the greatest growth. This urban population growth rate is expected to not only increase the demand for water, but exacerbate the possible shortfalls as well.

FIGURE 2-1. PROJECTED TEXAS POPULATION, 1990-2040



Source: Water for Texas, Vol 1. (1990)

2. CHANGING ECONOMIC CONDITIONS

The percentage of jobs occurring in the agricultural sector of the economy in

the Western States, including Texas, has been declining. It is this shift of jobs away from agriculture to manufacturing and to the service economy, coupled with continued urban population growth, that constitutes the major force creating pressure to reallocate water from "lower economic value" agricultural uses to "higher economic valued" urban manufacturing and municipal uses. Historically, irrigated agriculture was the driving force behind the development of the Texas appropriation system; today, it is the force behind the voluntary transfers movement.

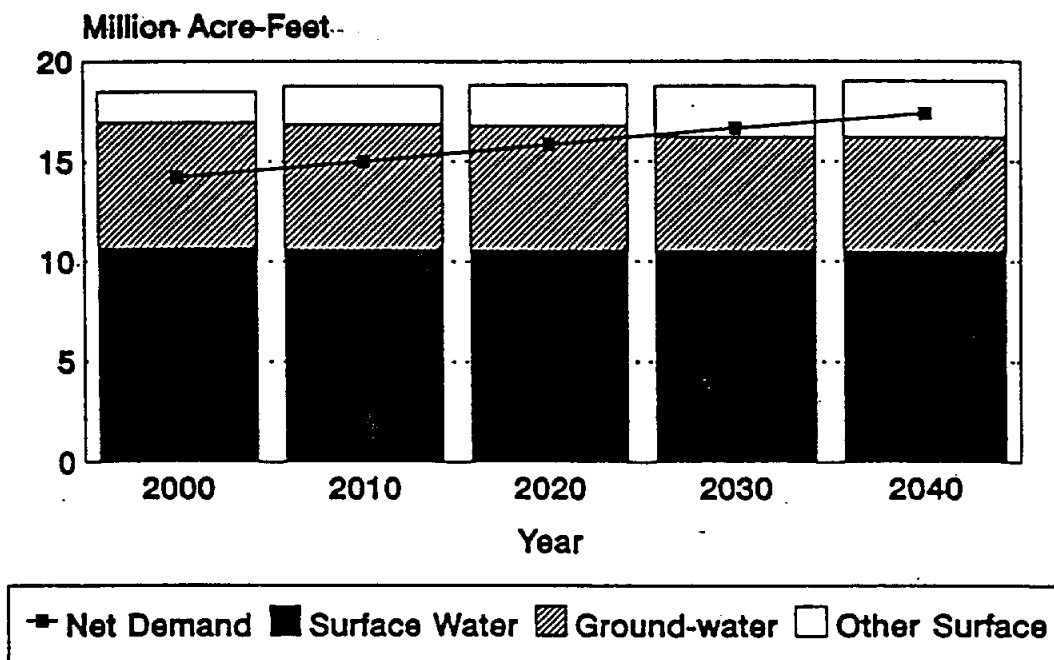
While irrigation water use comprises the largest portion of Texas water use, irrigation consumption peaked in the early 1980's and is projected to decline over time. Much of this decline in irrigation occurred in groundwater areas. If the trend in economic sector shifts continue, urban water uses will become the dominant water use in the State by 2040.

3. INCREASING WATER DEMANDS

The Texas Water Development Board's high demand and supply projections over the next 50 years are displayed in Figure 2-2. State water supplies are generally sufficient to meet projected needs if conservation savings and return flow data are taken into account.⁹³ According to the 1990 Water for Texas Plan, if conservation savings are not realized, further source supplies will be needed. Undoubtedly, these new facilities will require substantial investments and could generate significant opposition from the many environmental stakeholders. Given the difficulty in developing new reservoirs, water reallocation through voluntary transfers becomes an appealing political and economic alternative.

⁹³ The amount of water used by the various sectors of the Texas economy is highly dependent on demographic, economic, and climatological factors. While there is variability in different regions of the state, in aggregate, regional totals provide an overview of the State's total water use. Caution should be used in projecting statewide patterns for each region as it may mask individual regional differences. Nonetheless, trend patterns and needs become apparent.

FIGURE 2-2. PROJECTED STATEWIDE WATER DEMAND AND SUPPLY



Source: Water for Texas, 1990

4. WATER NEEDS FOR ENVIRONMENTAL PROTECTION

The most remarkable new demand is for leaving water in place for non-consumptive environmental and recreational uses. Recreation has become a leading industry in the West, rivaling or surpassing agriculture in many states. Boating, fishing, hunting and other outdoor pursuits require that a certain amount of water remain in streams and lakes to protect these *in-situ* values. Although techniques to assess the economic contributions of *in-situ* water are imprecise, in many instances the economic value added to a community, region or state is considerable. At least four major economic benefits can be generated by maintaining a minimum instream flow. These include: direct recreation benefits;⁹⁴

⁹⁴ Daubert, J & Young, R., Economic Benefits from Instream Flow in a Colorado River Mountain Stream. Colorado Water Resources Research Institute, Report # 91, Colorado State University: Ft. Collins, (1979).

area or regional impact;⁹⁵ generation of non-user values;⁹⁶ and water quality benefits.⁹⁷ Few studies and little literature exists that document the total impact on the Texas economy from inland water recreation.

A 1987 study by the Texas Parks and Wildlife Department indicated that Texans spent over a billion dollars on recreation equipment with boating and water-skiing equipment sales comprising nearly 40 percent of that total. While this study does not directly address the economic values associated with recreation use of inland waters it does indicate that annual water related equipment purchases amount to nearly \$400 million.⁹⁸

Another study published in 1968 by the Texas Department of Water Resources projected the economic benefits attributed to recreational uses of selected reservoirs at \$1.1 billion dollars.⁹⁹ This study sought to estimate the potential recreation benefits provided by reservoirs that were proposed in the preliminary Texas Water Plan. Data for this study were collected from 8 reservoir sites during the summer of 1965. These reservoirs were chosen on the basis of accessibility, facilities, variety of recreation opportunity, and geographic representation. Recreation demand curves for the decades between 1970 and 2020 were created for 54 proposed reservoirs. The estimates pertain to primary recreation benefits, not secondary or tertiary benefits.

⁹⁵ Cordell, H., Bergstrom, G., Ashley, G., & Karish, J., *Economic Effects of River Recreation on Local Economies*. 26 *Water Resources Bulletin* 53-60 (1990).

⁹⁶ Greenley, D., Walsh, R., & Young, R., *Economic Benefits of Improved Water Quality*, Boulder: Westview Press (1989).

⁹⁷ Young, R. & Gray, S., *Economic Value of Water: Concepts and Empirical Estimates*. Springfield, Va: National Technical Information Service, Accession # PB-210356.

⁹⁸ Texas Parks and Wildlife Department, *1990 TORP--Assessment and Policy Plan*, Austin, (1990), pp. 63-66.

⁹⁹ Grubb, H & Goodwin, J. *Economic Evaluation of Water-Oriented Recreation in the Preliminary Texas Water Plan*, Texas Water Development Board. Report #84. (September 1968).

The calculated benefits were to be used to justify certain water projects.¹⁰⁰

Closely related to the instream flow issue is freshwater inflows to estuaries. The literature documents the importance of freshwater inflows to maintaining estuary integrity and economic productivity. Consider for example the economic value of Texas estuaries. The total impact on the Texas economy from sport and commercial fishing provided by estuaries exceeded an estimated \$1.3 billion in 1985.¹⁰¹

Apart from the substantial economic values associated with recreational use of water there is a growing public recognition and demand for maintenance of environmental integrity that comes from leaving a certain amount of water in place. Changing water use from consumptive off-stream uses to maintaining a certain instream and estuary freshwater inflow has become a major priority.¹⁰²

II. WATER MARKETING AS A VOLUNTARY TRANSFER TECHNIQUE

Reallocation of water can be accomplished either by adverse action against a water user or by voluntary transfers¹⁰³ between buyers and sellers of water rights. Voluntary transfers are principally undertaken through water marketing. A water market is an institutional setting within which the right to water is bought, sold, leased, rented, traded or transferred among consenting parties.

¹⁰⁰ *Id.* The study was limited in that it did not include a time shift variable, and therefore could not forecast recreation in the future. The necessary data for a time series analysis was not available at the time. The authors note that if the participation rate in water-oriented recreational activities increases, these forecasts will be an underestimate of benefits.

¹⁰¹ Kaiser, R. & Kelly, S. Water Rights for Texas Estuaries, 18 *Texas Tech Law Review*, 1121, 1123 (1987).

¹⁰² *Id.* Among the options available to maintaining freshwater inflows is the purchase of water rights through negotiated transfers, the use of eminent domain, permit constraints, public trust and reservation of water for inflows.

¹⁰³ A water transfer refers to a change in a water user or to a change in the purpose of use, place of use, point of diversion, period of use of water.

Market transactions are reviewed and approved by a state water agency or through court proceedings. The literature clearly recognizes that markets for water rights are not, nor should they be, totally free and unconstrained but can best be described as *directed markets—directed and controlled by state water agencies*.¹⁰⁴ Prior appropriation law in all the Western states, including Texas, requires that certain transfers¹⁰⁵ have oversight and approval by a state water agency—hence the term a directed market.

Water markets do not resemble more conventional markets for a variety of reasons, including the long tradition of subsidized water, the concentration of large amounts of public water in private entities, and the equally long tradition that water must support a wide variety of public values. The directed market approach recognizes that water is unlike other market commodities and that substantial third party and public interest considerations must be considered in water reallocations.

1. CONDITIONS FOR THE DEVELOPMENT OF WATER MARKETS

It borders on tautology to posit that a water marketing program only requires scarcity and defined property rights in water. Other factors are important to developing a successful market-based approach to reallocating water. Many of the articles on water marketing document examples of water transactions but few identify the necessary conditions for the development of market processes.¹⁰⁶ One study examined water transactions to determine degrees of fit with a market-based

104 See National Research Council, Water Transfers in the West, (1992), p. 3.

105 Some transfers do not go through the state approval process. Internal transfers (those occurring within the service area of irrigation districts, or river authorities) may not require state agency approval, especially if the water will be put to a use already authorized for district water.

106 Two articles have sought to outline the elements of water marketing. See Saliba, B & Bush, D., Water Markets in Theory and Practice; (1987) and Brajer, V. et al., The Strengths and Weaknesses of Water Markets as They Affect Water Scarcity and Sovereignty Interests in the West, 29 *Natural Resources Journal*, 489 (1989).

paradigm.¹⁰⁷ Others have reviewed policy parameters, environmental and third-party impacts of water marketing.¹⁰⁸ From a review of this literature, and considering western water marketing practices, it is apparent that the following eight elements are necessary for the development and operation of a directed market.¹⁰⁹ The elements are:

- (1) defined property rights in water;
- (2) a critical mass of buyers and sellers;
- (3) a registry for market information;
- (4) a conveyance system to move water;
- (5) fully appropriated water supplies (scarcity);
- (6) physical, fiscal or political limitations on developing new supplies;
- (7) existing water in low valued agricultural uses; and
- (8) increasing municipal and industrial demands for water.

A. Defined Property Rights in Water

Property rights embody a bundle of entitlements defining ownership, privileges and limitations for the use of water.¹¹⁰ A property rights system that can produce an efficient allocation of water generally has these four characteristics:

¹⁰⁷ See MacDonnell, L., The Management Transfer Process As a Management Option for Meeting Changing Water Demands. (1990).

¹⁰⁸ See National Research Council, Water Transfers in the West. (1992).

¹⁰⁹ This discussion draws from Brajer, V., et al. The Strengths and Weakness of Water Markets as They Affect Water Scarcity and Sovereignty Interests in the West, 29 *Natural Resources Journal* 489, 495-506 (1989). It should be noted that an economist's theoretical "perfect market" does not exist in western water law. In theory this type of market would not be regulated or controlled by institutions except to protect the unfettered freedom of the market.

¹¹⁰ For a concise discussion of the importance of property rights to a capitalist market system see Tietenberg, T., Environmental and Natural Resource Economics, (3rd), Harper Collins, 1992, Ch 3. This short discussion draws from that source.

- a. *Water Ownership*--a legal concept that assigns the right to use the water to an individual or corporate owner;
- b. *Exclusivity*--a right granting to the owner the ability to exclude others from using the water without the owners consent;
- c. *Transferability*--a right of the water owner to convey part or all of the bundle of rights to another party; and
- d. *Enforceability*--a right of the owner to protect ownership, exclusivity and transferability from encroachment or seizure by others.

B. A Critical Mass of Buyers and Sellers

For the market to function efficiently, no one buyer or seller, or group of buyers or sellers can have the power to fix the price of water. In economic terms, a "critical mass" is not numerically defined but simply means that no one party acting alone can affect the price of water. Applying this concept to water transfers would mean that more than one city (purchaser) and more than supplier (farmer, rancher or water district) should be involved in the market process.

C. A Registry for Market Information

Data on prices, potential sellers and buyers, delivery conditions and other market transactions must be available to the parties in order to have a well-functioning market. Buyers and sellers must have easy and inexpensive access to this type of information for a market to work successfully.

Few water institutions exist to provide this type of data or to act as a clearing house for information concerning suppliers and traders of water.¹¹¹ Individuals seeking to buy or sell water rights must incur substantial "search costs" if they wish to engage in water transactions.

¹¹¹ The proposed rules for the Texas Water Bank include provisions for a "registry of buyers and sellers." See 31 Tex. Admin. Code § 359.1-.14.

D. A Conveyance System to Move Water

A means of efficiently and effectively moving water from the seller to the new purchaser must exist. This conveyance is not a problem if the purchaser is downstream from the seller. The seller merely uses the natural conduit (the river) to convey water. Markets will not work efficiently where physical, economic, and legal barriers exist to prevent the transportation of water from the source of supply to the place of use.

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. In the case of California, this system moves water from the northern to the southern portion of the state--a distance of more than 500 miles. Similarly, Colorado has developed a system for moving water across the continental divide to serve the growing population centers on the front range of the Rockies.

E. Fully Appropriated Water Supply

For a market system to be successful the sum of the cost to acquire water must be less than alternative ways to obtain water. One of the least expensive ways to acquire water is to obtain a permit through a state agency, however, if water is not available for appropriation other means must be pursued.

Nationally, and in Texas, very little water remains for appropriation. A 1975 assessment of water supplies in the U.S. determined that 86 percent of the nation's average annual streamflows were used and in many western states water use exceeds the average annual renewal supply.¹¹² This pattern of oversubscribed supplies is present in all water marketing systems described in the literature.

In Texas, oversubscription of some surface water (see Figure 2-3 on adjoining page outlining the rivers in Texas where water is not available for further

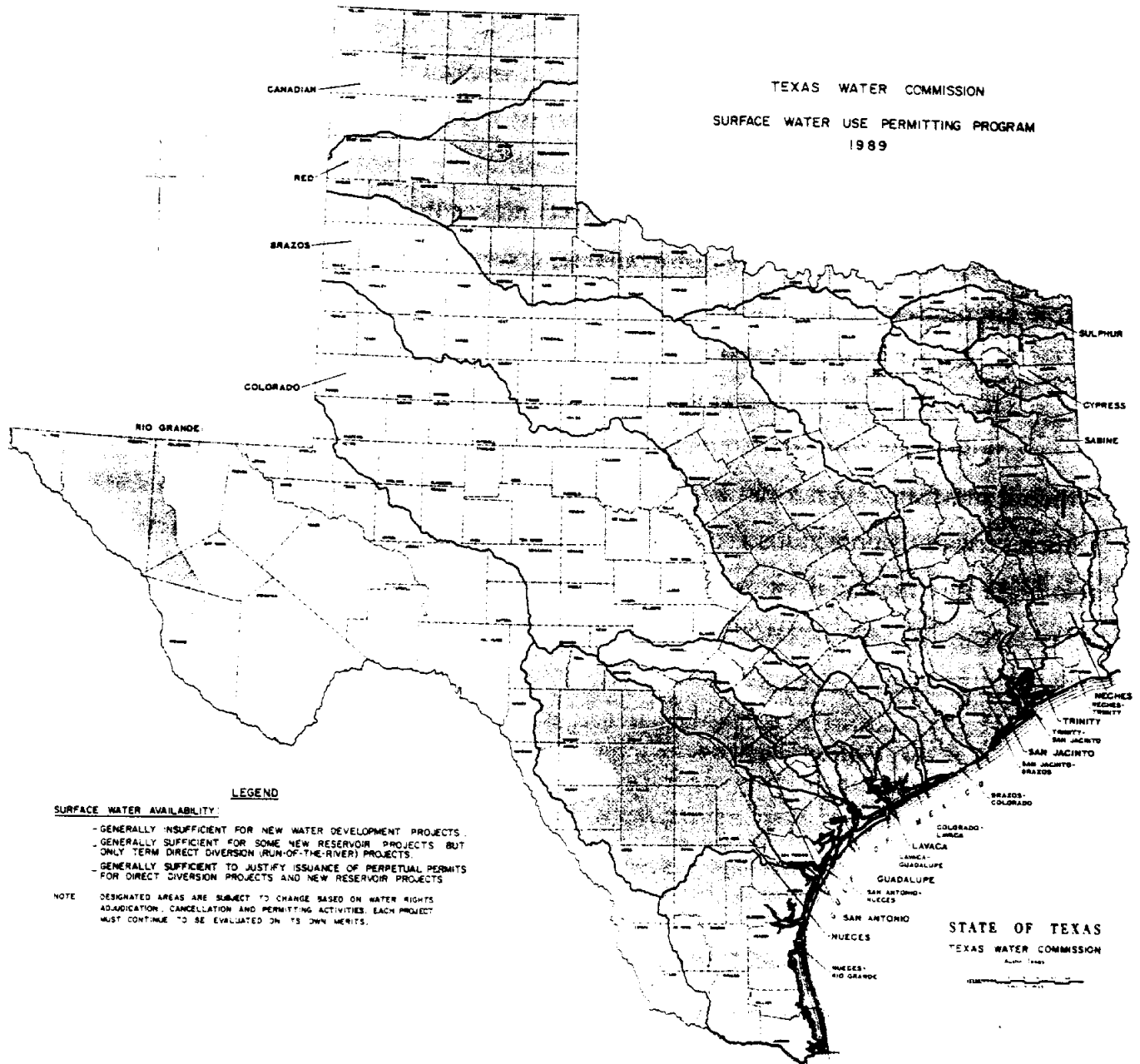
¹¹² See U.S. Water Resources Council, Second National Water Assessment, (1978).

appropriation) and mining of groundwater supplies is a problem.¹¹³ The lower Rio Grande Valley is the best documented example of a fully appropriated river where a water market has developed as a means to transfer water from lower valued to higher valued uses.¹¹⁴ Other rivers that approach the fully appropriated status are the Brazos and Colorado (see Figure 2-3).

¹¹³ See Texas Water Development Board, Water For Texas, 1990, p. 1-7. Mining of groundwater can cause water quality problems and reduce springflows. This pattern is most acute in the Edwards Aquifer.

¹¹⁴ Schoolmaster, A., Water Marketing and Water Rights Transfers in the Lower Rio Grande Valley, Texas, 43 *Professional Geographer*, 292 (1991); Chang, C., & Griffin, R., Water Marketing as a Reallocation Institution in Texas, 28 *Water Resources Research* 879 (1992).

FIGURE 2-3. STATUS OF SURFACE WATER PERMITS: 1989



F. Limited Availability of Other Supplies

Historically, water has been obtained in at least four ways: (1) through appropriating surface water rights in the basin to which no previous claim has been made,¹¹⁵ (2) through constructing surface water development projects to capture, store, and transport water for areas in the basin where local supplies are perceived as inadequate,¹¹⁶ (3) through interbasin transfer of water¹¹⁷ and (4) through pumping groundwater¹¹⁸. The economic and political difficulty encountered in seeking to justify large scale water development projects makes the future of this option very dim. Where these options are not available, conservation and water marketing are viable alternatives to new supplies.

G. Under Valued Water Use

The reallocation of water through a market system is driven by the prospect of economic gains from transferring water to a location, season or purpose of use in which it generates higher net benefits than under existing use pattern.¹¹⁹ In spite of claims of water's enormous economic importance, water actually exhibits a relatively low marginal value. The estimated direct marginal value productivity of

¹¹⁵ As described in the previous section, the surface waters of most western and Texas streams are nearly fully appropriated.

¹¹⁶ In Texas, and other western states, there are still some sites available for reservoir development but major economic and environmental considerations prevent development. See Banks, Williams, & Harris, *Developing New Water Supplies, In Water Scarcity: Impacts on Western Agriculture* (Englebert & Scheuring, eds., 1984).

¹¹⁷ Both California and Colorado have a long history of interbasin transfers of water not matched by other states. The Central Arizona Project, which transports water from the Colorado River to Phoenix and Tucson, represents the last successful large scale effort to transport water out of a basin.

¹¹⁸ Groundwater overdrafting is a problem of widespread concern. Texas has a history of problems with overdrafting and long-term reliability of groundwater as a water supply.

¹¹⁹ Saliba, B. and Bush, D., *Water Markets in Theory and Practice*, Boulder: Westview Press (1987).

irrigation water falls in the range of \$25-\$75 per acre-foot.¹²⁰ In portions of Texas, irrigators are paying an average of \$18-\$26 per acre foot.¹²¹ This is significant considering irrigated agriculture accounts for more than 80 percent of western water use and for more than 70 percent of water use in Texas.¹²²

In areas where water markets are in operation water has primarily moved from lower valued agricultural uses to higher valued municipal and industrial uses.¹²³ In one of the largest water marketing programs to date, the allocations from the California Drought Water Bank went primarily to urban uses. The major water purchaser in the 1991 Drought Water Bank was the Metropolitan Water District of Southern California which accounted for 55 percent of the water purchased from the Bank.¹²⁴

H. Increasing Urban Population Growth & Water Demand

Tangential to the "critical mass" and "undervalued" elements, but of equal importance, is the requirement that purchasers for higher valued water exist. This means that higher valued purchasers, such as cities, must be in the market to purchase lower valued water from water rights holders. While not an absolute predicate for water markets, the bulk of the transactions have arisen in states and regions where urban populations are growing and rural populations are declining. This factor, when combined with nearly total appropriation of surface water supplies, generates the pressures to reallocate water to a higher valued use. In

¹²⁰ Young, R., Why are There So Few Transactions Among Water Users?, 68 *American Journal of Agricultural Economics*, 1143-1151 (1986).

¹²¹ See Jensen, R., The Texas Water Market, 13(2) *Texas Water Resources* 3, (1987).

¹²² See TWDB, Water for Texas, 1990.

¹²³ Jensen, R., The Texas Water Market. p. 4. Between 1980 and 1986 in the middle and lower Rio Grande Valley more than 28,000 acre feet of agricultural water rights were sold to municipalities.

¹²⁴ Wahl, R., Water Marketing in California: Past Experience, Future Prospects, Los Angeles: Reason Foundation, Policy Study No. 162 (July 1993).

Texas, these conditions exist in the lower Rio Grande Valley where the vast majority of transfers are from agriculture to urban uses.¹²⁵

2. BENEFITS AND VALUES OF WATER MARKETING

Much of the literature on the value of water marketing has been hypothetical, anecdotal, or advocacy in nature. While the rationale for reallocating water through directed water markets differs among the states some justifications are common to all. The following seven reasons are given to justify market-based water reallocations: (1) provides water to growing cities; (2) a tool to manage drought; (3) promotes efficient water use; (4) promotes water conservation; (5) provides water for environmental needs and recreation use; (6) offers an alternative to reservoir construction; and (7) promotes political harmony.

A. Provides Water to Growing Cities

The sale of water, or a water right, is identified in the literature, in state planning documents and in practice as a way to provide cities with a low cost dependable water supply.¹²⁶ The trend is to move water from agricultural uses to growing cities which can no longer secure additional supplies through surface water augmentation or groundwater pumping. This was illustrated during the drought years of the 1980's when cities began aggressively seeking additional supplies to protect their populations from future shortages.¹²⁷

B. A Tool for Managing Drought

The California Drought Water Bank demonstrated the use of water

¹²⁵ See Chang, C., & Griffin, R., Water Marketing as a Reallocative Institution in Texas, 28 Water Resources Research Bulletin, 879, 886, (1992).

¹²⁶ See National Research Council, Water Transfers in the West, p. 16; Wahl, R., Markets for Federal Water: Subsidies, Property Rights and the Bureau of Reclamation, Washington D.C.: Resources for the Future, (1989); and Willey, Z., Economic Development and Environmental Quality in California's Water System, Berkeley: Instit. of Govt. Studies, Univ. of Calif, (1985).

¹²⁷ See Chang & Griffin, R., Water Marketing as a Reallocative Institution in Texas, (1992) and Wahl, R., Water Marketing in California, (1993).

marketing to meet urban water needs during drought conditions.¹²⁸ The Drought Water Bank was established in response to four years of drought conditions in California. At the end of 1990, reservoir storage was at 32 percent of capacity and the State Water project would make no water deliveries to its agricultural contractors and only 10 percent of normal deliveries to its municipal and industrial contractors. During the same time period, the federal Central Valley Project announced that its contractors would receive only 25 percent of their contracted amounts.

As a result of this situation, California's Governor signed an Executive Order establishing a drought management team. The team was to coordinate state efforts to manage the drought, to help local governments prepare and implement drought emergency plans, to develop a clearing house for facilitating water marketing transfers and to provide the Governor with periodic reports and recommendations. The first report, submitted some 15 days after the team was established, recommended the creation of an emergency drought water bank to supply four critical needs: municipal and industrial uses, agricultural uses, the protection of fish and wildlife and carryover storage for 1992.

The Department of Water Resources was responsible for operating the Bank and it offered membership to any corporation, water company, or public agency that had a responsibility to supply water for agricultural, municipal, fish and wildlife or other uses. Buy and sell agreements were developed by staff of the Department and the Bank began to purchase water.

The water movement in the Bank was generally from sellers in the northern part of the state to purchasers south of the Delta. The major purchaser in 1991 was the Metropolitan Water District of Southern California which accounted for 55

¹²⁸ A number of studies and reports have chronicled the development and operation of the California Drought Water Bank. *See for example*, California Department of Water Resources, The 1991 Drought Water Bank, Sacramento: Department of Water Resources, (1992); Mitchell, D., Water Marketing in California, San Francisco: The Bay Area Economic Forum, (1992); Howitt, R., Moore, N., & Smith, R., A Retrospective on California's 1991 Emergency Drought Water Bank, Sacramento: Department of Water Resources, (1992); and Wahl, R., Water Marketing in California: Past Experience. Future Prospects, Los Angeles; Reason Foundation, Policy Study No. 162 (1993). The discussion on drought water banks is taken from these reports.

percent of the urban water uses purchased from the Bank.

As indicated in Table 2-1, water purchases in 1991 and 1992 were from three sources: land fallowing, groundwater and stored water. In 1991, 820,655 acre-feet of water was acquired by the Bank and only 193,193 acre-feet was acquired in 1992. More favorable weather conditions, spring rains, a mild summer and urban water conservation measures contributed to a lower amount of water purchased in 1992.

In 1991, the Bank's purchase price for water ranged from \$125 per acre-foot to \$450 per acre foot and the Bank's sale price was set at \$175 per acre-foot. Because of carryover storage in reservoirs the Bank offered to purchase water for only \$50 per acre foot in 1992. This price was set to attract water from groundwater substitutions, reservoir storage and to discourage land-fallowing agreements.¹²⁹ The 1992 sale price of water was set at \$72 per acre-foot.

The operation of the Bank raised some concerns about the effect on local agricultural economies from the land-fallowing contracts and environmental impacts from groundwater pumping.

Although not all parties in California were supportive of the Drought Water Bank, all participants considered it a successful short-term solution to severe drought conditions.¹³⁰ The Bank was organized very quickly and provided over 820,000 acre-feet of water in 1991. The \$125 purchase price for water was adequate to attract enough sellers and the sales price of \$175 was attractive to a number of purchasers. The Bank spent some \$100 million on purchases in 1991 and received \$68 million in revenues from purchasers (the difference being accounted for by the unsold water held in storage in the State Water Project).¹³¹

¹²⁹ Wahl, R. Water Marketing in California. (1993), p. 14.

¹³⁰ See Lund, J., Morris, I., and Kanazawa, R., Recent California Water Transfers: Emerging Options in Water Management. Davis: Center for Environmental and Water Resource Engineering, (1992), p. 57.

¹³¹ Wahl, Water Marketing in California. (1993), p. 14.

TABLE 2-1. SOURCES AND USES OF WATER IN CALIFORNIA DROUGHT WATER BANK*

	<u>1991</u>		<u>1992</u>	
	Acre-feet	Percent	Acre-feet	Percent
<u>Source</u>				
Fallowing	414,743	50%	0	0%
Groundwater	258,590	32%	161,593	84%
Stored Water	147,332	18%	31,600	16%
TOTAL	820,655		193,193	
<u>Allocation</u>				
Urban Uses	307,373	47%	39,000	20%
Agric. Uses	82,597	13%	95,250	49%
State Project	265,588	40%	0	0%
Dept. of Fish and Game	0	0%	24,465	13%
Delta Water	165,137	20%	34,478	18%
TOTAL	820,655		193,193	

* Data from Steve MacCaulay, Manager, State Water Bank, Sacramento, California, January 1993

C. Promotes Efficient Water Use

Economists contend that a market system promotes an efficient allocation of water resources.¹³² An efficient allocation is one in which water is used to support the highest valued use. In a competitive market this is determined by supply and demand which determines price. Thus water prices will be bid up until there is a match between the amount of water purchasers want to buy and the amount of water that sellers wish to convey. This process is described by economists as efficient--efficient in the sense that resources are being used in their highest value use.

The notion of valuing water based on its highest and best economic use is captured in the National Water Commission discussion on the value of water:

The comparison of water values in alternative uses will become increasingly important in the years ahead as growing demands compete for limited natural supplies and values in use increase. The opportunities for net gains by better allocations will be much greater. Not only will efficiency in the design of facilities be important, but also efficiency in allocation of water itself. Economic values provide the best general indication of the basic worth of water if appropriate attention is given to protection of environmental values.¹³³

The Commission basically adopted a market-based paradigm by equating highest use for water with the economists "efficient allocation" model.

In western states that have experienced market-based reallocations of water the most efficient use for water is for municipal or industrial purposes. Water marketing experiences in the lower Rio Grande Valley of Texas corroborate this principle. Studies of water transactions indicate that municipal water rights and uses were the most expensive or highest valued use and that lower valued agricultural

¹³² Welfare economists suggest that water resources are efficiently allocated "when no mutually advantageous exchanges are possible between any pair of claimants, which can only mean that each claimant sets his last or marginal unit of water equally with the others, measured in terms of the quantity of other resources (or dollars) that he is willing to trade for an additional unit of water." Hirshleifer, J., DeHaven, J. and Milliman, J., Water Supply: Economics, Technology and Policy (1960), p. 38.

¹³³ National Water Commission, Water Policies for the Future, (1973), p. 47.

uses for water were converted to higher valued municipal uses.¹³⁴

D. Promotes Water Conservation

In an era of increasing scarcity the demand to "conserve" water takes on greater legal, economic and political urgency. The wave of conservation has touched most state planning documents and reached the prior appropriation water laws of most western states. This new water conservation imperative, expressed as preserving water quality, avoiding waste or achieving efficiency of use is incorporated in most prior appropriation doctrines.

Conservation, however, is not self-defining and has been subjected to several definitions and interpretations.¹³⁵ Four classic themes of conservation can be gleaned from the literature. Conservation has been identified with; (1) augmenting existing water supplies by developing new water resources; (2) technologic efficiency by maximizing the use of water through efficient engineering; (3) reducing the use of water; (4) economic efficiency.¹³⁶ Except for the notion of developing new supplies, efficiency is the litmus test for conservation.

Western water law and policy is moving toward conservation and economic efficiency. Conservation strategies seek both to remove disincentives and to create incentives to conserve water. Three common models can be found in water

¹³⁴ See Chang, C., & Griffin, R., Water Marketing as a Reallocative Institution in Texas, 28 *Water Resources Research*, 879 (1992); Schoolmaster, A., Water Marketing and Water Rights Transfers in the Lower Rio Grande Valley, Texas, 43 *Professional Geographer*, 292 (1991).

¹³⁵ See Tarlock, D., The Changing Meaning of Water Conservation in the West, 66 *Nebraska Law Review* 145 (1987). For a discussion of progressive conservation from a political perspective see Hays, Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, Cambridge: Harvard Univ. Press, 1959.

¹³⁶ The Texas Water Code seeks to incorporate all of these options. Section 11.002 (8) of the Code defines conservation as

- (A) the development of water resources; and
- (B) those practices, techniques, and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternatives uses.

conservation strategies:

1. **Technology Forcing Model.** Using this approach, conservation is achieved by mandating that all water users adopt "best management practices" or "best available technology" in their use of water. Residential building codes mandating the use of water reduction devices in plumbing is one example. The technology forcing approach has been adopted in Arizona in response to groundwater mining.¹³⁷

2. **Government Subsidies.** Under this approach, water users are provided with some type of financial incentive to use technology or management practices to reduce their use of water. The Texas Agricultural Water Conservation Program providing low-interest loans to farmers to purchase and install efficient irrigation equipment is a classic example of this model.¹³⁸

3. **Market-Based Sales.** This approach is incentive based in that it rewards the conservor with the right to sell the fruits of their labor--namely that amount of water saved through conservation practices. While some legal and institutional impediments¹³⁹ have prevented the use of this model, a number of states have passed legislation that clarifies the rights of conservors and gives them

¹³⁷ See Ariz. Rev. Stat. Ann. aa 45-562A. Industrial users in Phoenix, Prescott and Tucson must use the latest available technology consistent with reasonable economic returns as a conservation measure. See Rieke, The Arizona Solution to Allocation and Use of Groundwater in Western Water: Expanding Uses/Finite Supplies, (Seventh Annual Summer Program, Natural Resources Law Center, Univ. of Colorado School of Law, June 2-4, 1986).

¹³⁸ Attention must be given to evaluating how successful this program is in achieving water conservation goals. For studies on this program see Schoolmaster, F., and Fries, T., Implementing Agricultural and Urban Water Conservation Programs: A Texas Case Study, 12 Environmental Professional, 229 (1990) and Lacewell, R., and Segarra, E., Farmers, Lenders and Water Districts Response to Texas' Low Interest Loan Program for Water Conservation in Agriculture, Texas Water Resources Institute, Report TR 164, Texas A&M University: College Station, Texas (November 1993).

¹³⁹ Three infamous cases are cited as a legal barrier to the use of this method. See *State ex rel. Cary v. Cochran*, 292 N.W. 239 (Neb. 1940); and *Salt River Valley Water Users Association v. Kovacovich*, 411 P.2d 201 (Ariz. 1966); and *Southwestern Colorado Water Conservancy District v. Sheldon Farms*, 529 P.2d 1321 (Colo. 1974).

the title to conserved water.¹⁴⁰ By administrative rule, Texas provides that water saved through conservation practices will not be subject to cancellation proceedings.¹⁴¹

E. Provides Water for Environmental and Recreational Uses

As previously identified, there is a significant new demand for leaving water in place. The *in situ* environmental values and recreational benefits are difficult to sustain when water is diverted from streams and consumptively used. Existing instream flow and estuary inflow laws are often targeted to withdraw or reserve water from appropriation and offer limited protection to environmental values.¹⁴² By reserving a certain amount of stream flow from appropriation these values are protected. The major disadvantage of this strategy is that reservations may result in withdrawing waters that have already been appropriated thus provoking political dissension.

A more pragmatic approach to providing water for environmental and recreational values is to authorize agencies to appropriate water for these purposes through the use of water transfers. Water in the California Drought Water Bank was purchased by the state Department of Fish and Game and used to protect environmental values and fisheries during the 1992 drought year. As indicated in Table 2-1, over 24,000 acre-feet of water, or 15 percent of the allocation from the Bank was used to protect environmental and recreational values.

¹⁴⁰ See Cal. Water Code §§ 1010; 1011(b); 1012 and Ore. Rev. Stat. § 537.455 et seq. The Oregon statute requires a right holder intending to conserve water for transfer to submit a plan to the Water Resources Commission for approval. Once the plan is approved, the conserved water is assigned a priority date comparable to the original water right. Conserved water remaining in a stream is not considered abandoned and does not constitute an instream flow right.

¹⁴¹ 31 Texas Admin Code § 297.53

¹⁴² Kaiser, R. & Kelley, S., Water Rights for Texas Estuaries, 18 *Texas Tech Law Review*, 1121, 1155 (1987).

F. Offers an Alternative to New Reservoir Construction

The traditional state response to an increasing water demand and a limited supply was to augment the supply through construction of additional reservoirs. Throughout the West proposals to augment supply face stringent fiscal and political constraints.¹⁴³ Better management is imperative in order to accommodate increasing demands for consumptive and non-consumptive uses. Transfers of water from low value agricultural uses to higher valued municipal uses are becoming the norm rather than the exception. With varying degrees of enthusiasm, water suppliers, consumers, brokers, legislators and increasingly influential segments of the environmental community have accepted the premise that water marketing should be a major component of future western water law policy.¹⁴⁴ The state of Texas recognized the potential of water marketing--the transfer of water rights from existing uses to new uses at market value--by making this reallocation mechanism a significant part of state water policy.¹⁴⁵

G. Promotes Political Harmony

Forced reallocation of existing public resources to a new use, or user, without the consent of, or compensation to, present users violates fundamental notions of due process or equity.¹⁴⁶ Without a doubt this type of action will lead to political foment. In accepting that legal authority exists for government reallocation of water resources from agricultural to urban or environmental uses it does not automatically lead to the conclusion that this is prudent public policy. The question over how to meet increasing urban and environmental water demands while

¹⁴³ See National Research Council, Water Transfers in the West, (1992), p. 2.

¹⁴⁴ *Id.*

¹⁴⁵ The 1990 Texas Water Plan recognizes 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, Austin, (1990), p. 4-1.

¹⁴⁶ The political debates over private property rights, habitat protection and the federal Endangered Species Act illustrate this principle.

balancing the need to protect other legally recognized legitimate uses often leads to a "clash among values." These conflicts represent a clash between older, rural, agricultural constituencies and lifestyles and the newer more urbanized West and between agricultural and environmental interests. The challenge is to find a balancing point that allows broader participation in decision making while seeking to maintain political harmony.

Market-based water transfers empower rural, urban and environmental constituencies around themes of negotiated outcomes in self-selected forums rather than forced political and judicial forums. Water constituencies are free to make reallocations and accommodations at the level closest to the problem. Parties are able to set and control negotiation processes in a more predictable way. They are not constrained by highly unpredictable political processes.

Water transfers, predicated on voluntary agreements between the interested parties, is one way to minimize political acrimony over difficult reallocation questions.¹⁴⁷ Urban, rural and environmental interests in California recognize that tripartite participation in designing mechanisms to accommodate competing interests can best be carried out through a voluntary negotiation process rather than through forced political intervention. Voluntary water transfers through a marketing approach is a major step in this accommodation.

3. TYPES OF MARKETING TRANSACTIONS

The types of water transactions are limited only by the imagination and ingenuity of the parties seeking to meet their water needs. Various legal mechanisms exist to facilitate water transfers. Most of the legal barriers have been eased so that constraints tend to be of a institutional, fiscal or physical nature. The following discussion summarizes some of the types of water transactions possible in water marketing.

¹⁴⁷ Two national studies of water problems in the West have concluded that water transfers through a market-based approach provide an appropriate balance between efficiency and equity while fostering political harmony. See National Water Commission, Water Policies for the Future, (1973); and National Research Council, Water Transfers in the West, (1992), p. 14.

A. Sale of a Water Right

One way to describe the water transactions that take place is based on the totality and permanency of the transfer. Transfers occur along a continuum from an outright sale of a permanent water right to a sale of only a right to use the water (a lease) for a limited period of time.

1. *Permanent Sale of Total Entitlement.* Obviously, the outright purchase of a vested senior water right grants to the purchasers the totality and permanency of rights that the state recognizes. These appropriative water rights are subject only to the legitimate police power and public trust constraints exercised by the state. Although the formalities differ among the states, the prevailing rule is that most state vested water rights may, with state agency or court approval, be sold and transferred to different users, uses and places of use. The permanent sale and transfer of vested water rights occurs widely throughout the West.¹⁴⁸

2. *Sale of a Right to Use Water (Leases).* The right to use water may, again subject to state agency or court approval, be limited by the type of right conveyed and by the term of the right. A water right, representing the totality of the right may be leased for a season, a year or for many years.¹⁴⁹ Correspondingly, the totality of the right may be restricted along with the time of the right. Since a sale of the right to use water is not permanent, the parties may customize the arrangement to accommodate their specific needs. Among the customized arrangements are options for renewal, indexed rental rates and variable payment plans. The trend in the West is to lease water rather than to sell a permanent water right.¹⁵⁰

¹⁴⁸ See MacDonnell, L., The Water Transfer Process as a Management Option for Meeting Changing Water Demands, (1990), Ch 3.

¹⁴⁹ The water acquired by the California Drought Water Bank was not a permanent water right but was water leased to the Bank for the term of one (1) year.

¹⁵⁰ See MacDonnell, L. The Water Transfer Process as a Management Option for Meeting Changing Water Demands, (1990), Vol 1, Ch 3.

B. Option Contract

The option contract can be used by cities to augment existing supplies. Many cities have a reliable supply of water to meet their needs in normal years but may face shortages during times of drought. One way of dealing with this shortfall is for a city to negotiate a dry-year option agreement with a senior water rights holder to acquire a right to use their water only during dry years. In this way a senior rights holder can continue to use the water in normal years and it gives the purchaser a more reliable source during dry years.

Several examples of dry-year option contract negotiations between cities and irrigators can be found in the western states. On a large scale, the Metropolitan Water District (MWD) of southern California sought to develop a dry year option with irrigators for the right to use up to 100,000 acre-feet of water per year during dry years. The time period to be covered by the agreement was to last 35 years. Irrigators would retain their water rights and only give up their right to use water in dry years when the MWD would use the water. The irrigators rejected the proposal due to the uncertainty it would have introduced into their long range farming program.¹⁵¹

Another dry-year option contract was proposed in northern California by the East Bay Municipal Utility District (EBMUD) as a way to augment their water supply. The EBMUD supplies water to Oakland, Berkeley and other cities in the San Francisco Bay area. A local irrigator was offered a dry-year option for water at a price of \$50 acre-feet. The offer was rejected because the price was too low.¹⁵²

A dry-year option contract was successfully executed between a Utah city and a local farmer. The city paid \$25,000 for a 25 year arrangement and agreed to supply the farmer with hay and \$1,000 per year in any year that it exercised the option. Over the 25 year period the city used the water only three times. In these three dry

¹⁵¹ See 2 Water Market Update, (Feb 1988), p. 2.

¹⁵² See 2 Water Market Update, (Sept 1988), p. 13.

years, the farmer received his hay and a cash payment.¹⁵³

C. Subordination Agreements

These types of agreements can be used by junior appropriators to acquire, under certain conditions and for limited times, the priority right of a senior appropriator. Subordination agreements recognize that a major feature of a water right is its priority date, which can be leased separately from the water right itself. Essentially, a purchaser is buying the priority date. This type of transfer requires that the purchaser be a junior water rights holder who is seeking a higher priority.

D. Conservation Transfers

Water can be acquired by municipal or industrial users when they finance the modernization of irrigation systems in exchange for the right to use the water that is conserved. Most of these transfers have been in California which allows for the sale of conserved water.¹⁵⁴ Two of the most famous examples are in southern California. Both involved canal lining to save water that would have otherwise been lost through bank leakage.

In 1988, the Bureau of Reclamation awarded a contract for the lining of 1.5 miles of the Coachella Canal with an expected water savings of up to 100,000 acre-feet of water per year. The MWD plans to pay a large part of the cost for lining the canal in exchange for the salvaged water.¹⁵⁵

The Imperial Irrigation District, located just to the south of Coachella, is planning similar canal linings with the improvement paid for by the MWD. In exchange, the MWD will get the water for 35 years at a cost of about \$128 per acre-foot.¹⁵⁶

¹⁵³ National Research Council, Water Transfers in the West, (1992), p. 32.

¹⁵⁴ See Cal. Water Code §§ 1010; 1011(b). Oregon also allows conserved water to be transferred to other users. See Ore. Rev. Stat., §537.455 et seq.

¹⁵⁵ See 2 Water Market Update, (Oct, 1988), p. 2.

¹⁵⁶ See 1 Water Market Update, (Dec, 1987), p. 2.

Another example of a ditch lining transaction involved the city of Casper, Wyoming and the Casper-Alcova Irrigation District.¹⁵⁷ Under a 1982 agreement, the City agreed to line about 200 miles of ditches and canals operated by the District in exchange for up to 7,000 acre-feet of water per year. A hydrologic study determined the amount of water lost through the unlined ditch and the amount saved through the ditch lining program. Based on that study the City is entitled to receive the amount of water saved by the lining program. This amounts to 7,000 acre-feet per year. Since a Wyoming statute prohibited the transfer of water rights that increased the consumptive use of water, the Wyoming Legislature had to pass special legislation allowing the project to proceed. Under this project the City's cost is projected to be about \$56 per acre-foot per year--much less than the cost to build a new reservoir. It seems clear that the conservation benefits from improvement of existing water systems can be a cost-effective means for developing new supplies of water.¹⁵⁸

E. Water Ranches

States that continue to recognize that water rights are appurtenant to the land have experienced the transfer of water through the purchase of "water ranches"--lands bought only for their associated water rights. This practice is most prevalent in Arizona where Phoenix, Tucson and Scottsdale began buying thousands of acres of ranch land for their water rights.¹⁵⁹ After buying these ranches, the cities began leasing the land back to tenants for dry-land agricultural production.

To a lesser extent, cities in Colorado and New Mexico have also acquired ranches for their appurtenant water rights. Thornton, Colorado, a suburb of Denver, purchased 12,000 acres of irrigated farmland for \$52 million in order to obtain the

¹⁵⁷ Transaction reported in MacDonnell, L., The Water Transfer Process As a Management Option for Meeting Changing Water Demands, Vol II, (1990), pp. 16-18.

¹⁵⁸ *Id.* p 18.

¹⁵⁹ For specific details on these transactions see *Water Market Update*, Vol's 1 (1987) and Vol 2 (1988).

appurtenant right. Roswell, New Mexico purchased a 580 acre ranch for \$1.8 million in order to obtain a water right to 1,740 acre-feet/year. As the city did not immediately need the water it leased the land and water back to a local farmer for 3 years at about \$50,000 year.

F. Purchase of Water District Shares

It is a common practice in the West for water districts to hold water rights and to lease those rights to their members on a long term basis. Instead of buying water from these districts, many cities buy shares of water district stock. This practice has been used in Colorado and Utah.¹⁶⁰

G. Water Banks

A water bank is a reallocation option for transferring surplus water rights. Banks are basically brokerage institutions created for the purpose of buying water (leasing) from voluntary sellers and transferring it by lease or sales agreements to users with critical water needs. Water purchased from these banks has been used for municipal, agricultural, fish and wildlife, recreational and environmental purposes. Under these banking arrangements, the original water rights holders retain their permanent water right and only sell (or lease) to the bank the right to use the water. The bank then transfers the interest they have in the water to a purchaser. Generally, water banks do not purchase permanent water rights.

1. Public vs. Private Banks. In theory, a water bank could be publicly or privately owned and controlled. In reality, the water banks described in the literature and operating in California, Idaho, Texas and Washington are publically created banks. Except for the bank in Texas, which was created in 1993 and has no transaction history, the other water banks were created to handle large-scale water transactions where efficiencies and economies-of-scale were important variables and where individually brokered transactions were unable to produce the amount of

¹⁶⁰ Shupe, Weatherford, Checchio, *Western Water Rights: The Era of Reallocation*, 29 *Natural Resources Journal*, 413, 423-24 (1989).

water needed.¹⁶¹ One view supporting publically controlled banks came from the California Drought Water Bank. In California the need to facilitate large-scale water transactions was so new a concept that only a state bank could undertake the reviews required under state law and produce the number of contracts and quantities of water needed. In addition, the state-operated bank was able to coordinate changes in federal and state project operations necessary to meet the environmental concerns of the San Francisco-Sacramento Delta.¹⁶²

However, there is little question that if a well-functioning water transfer review process is in place and if a state has a history of utilizing market transactions to reallocate water, then privately brokered arrangements could substitute for the public brokerage water bank. Further, where there are no economies-of-scale, or significant environmental quality limitations, private brokerage of water transactions are possible. One study of the California Drought Water Bank recommended that private brokerage arrangements be undertaken in the future where the Bank is operating on less of an emergency status.¹⁶³

2. *Scope of Bank Coverage.* The domain of a water bank may be state-wide as in California, Idaho and Texas, or regional or local as in the Snake River, Boise River and Payette River water banks in Idaho. Where a surplus of water is available to meet regional or local water needs, a regional water bank is the preferred approach. This type of bank can provide a solution at the level closest to the problem. In instances where the needs are state-wide and a state-wide conveyance system is in place, then a state-wide bank is probably the appropriate

¹⁶¹ The California Drought Water Bank acquired over 800,000 acre-feet of water in the midst of the 1991 drought. Most of the water was acquired within a 30 day time period.

¹⁶² Wahl, Water Marketing in California, (1993), p. 15.

¹⁶³ *Id.* p. 16. See also Mitchell, D. Water Marketing in California: Resolving Third-party Impact Issues, San Francisco: A Report of The Bay Area Economic Forum, (1993).

brokerage approach.¹⁶⁴

3. *Brokering of Information.* In addition to providing water, banks are in a pivotal position to provide information on water availability, pricing, sellers, purchasers, and environmental limitations so necessary for a market-based reallocation system to work. An adequate data base is essential to the function of banks and to market-based transactions.

¹⁶⁴ All of these conditions were met in California, where the drought produced state-wide water shortages, where a state-wide water distribution system was in place (Central Valley Project & State Water Project) and where a needed scale of management was state-wide.

CHAPTER TWO SUMMARY

This chapter has reviewed the transfer of water rights through voluntary as opposed to involuntary means. Voluntary transfers refer to a conveyance of a right from one person to another, or to a change in location, purpose or use for water. These types of transfers have been justified as one means to promote the public interest in that they achieve political harmony by allowing rights holders to transfer rights in order to fulfill changing needs and values. The pressures for change that have increased the interest in water transfers are changing demographics, changing economic conditions, increasing water demands, and environmental protection.

Rural to urban population shifts have increased the value of and need for municipal uses of water. Water transfers can be used to achieve an efficient allocation of water by switching from a lower valued use (agriculture) to a higher valued use (municipal/manufacturing). Concurrent with the increasing demands for urban water are the increasing needs for protecting the instream uses of water. The *in situ* values of water can be translated into recreational benefits, regional economic impacts, generation of non-user values, and water quality benefits.

In order to ensure an efficient water market, well-defined property rights must be established. Ownership, exclusivity, transferability, and enforceability constitute a well-defined property right that can produce an efficient allocation of water. A critical mass of buyers and sellers is also necessary to avoid water monopolies. Finally, a flow of market information is critical to ensure the efficient allocation of water rights.

Water transfers provide a viable mechanism to supply water to growing cities, promote efficient water use and conservation, supply water for environmental and recreational uses. In California, water transfers have been used to allocate water during times of drought. In other states, transfers are an alternative to new reservoir construction and can promote political harmony in the reallocation process. These benefits can be achieved through a variety of transactions including; sale of rights, option contracts, subordination agreements, conservation transfers,

water ranches, purchase of water shares, and water banks.

CHAPTER III. PUBLIC INTEREST AND LEGAL ISSUES IN WATER MARKETING

It is important to recognize that water marketing is not a panacea for the growing water problems in the west or in Texas. State water policy needs a multifaceted approach that, in addition to marketing, requires continued urban and rural water conservation, reuse and recycling, water banking, reservoirs and conjunctive surface and groundwater management. Excessive reliance on marketing approaches to remedy the state's water needs would not be propitious public policy in light of the technical, public interest and legal issues in water marketing. Each of these categories will be discussed in this chapter.

I. PUBLIC INTEREST ISSUES--Third-Party Impacts

Since water supports a wide range of private and public uses, water transfers are not simple transactions between buyers and sellers of water rights. Significant public interests and values are impacted by water transfers. Many examinations of water markets looked at the technical aspects of transaction and did not take into account that transfers can impact other parties, or pose negative consequences for environmental resources.¹⁶⁵ Public interest examinations are now being discussed in the water marketing literature. This is evidenced by the National Research Council's report on water transfers which recognized that:

allocational processes should accord third-parties with water rights--and those without them--legally cognizable interests in transfers and that states should develop new ways to consider those interests. Water has never been allocated solely by markets, and market transfers are not an end in and of themselves but a means to the end of a water allocation process that serves both private and public interests.¹⁶⁶

¹⁶⁵ See Colby, B., *Transaction Costs and Efficiency in Western Water Allocation*, 72 *American Journal of Agricultural Economics*, 1184 (1990); Saliba, B. & Bush., D., Water Marketing in Theory and Practice, Boulder: Westview Press, (1987).

¹⁶⁶ National Research Council, Water Transfers in the West, (1993); p. 4.

Third-party impacts of water marketing are undeniably an important policy consideration in water reallocation.¹⁶⁷ To date, most of the debate and literature surrounding this issue has focused on identifying the array of parties and types of impacts from water marketing (see Table 3-1 and Figure 3-1). There is a paucity of objective data on the likely magnitude of third party impacts.¹⁶⁸ Before discussing the legal protections extended to third-parties by some western states, an explanation of protected parties and possible impacts is in order.¹⁶⁹

1. TYPES OF TRANSFERS

The range of parties affected is often determined by the type of water transfer. Transfers that can impact third-parties include changes in (1) ownership of the water right; (2) point of diversion; (3) place of use; (4) purpose of use; (5) period of use; and (6) interbasin transfers. Those changes in place and purpose of use and in basin of origin present a greater likelihood of third party impacts.¹⁷⁰ A change in ownership alone does not usually lead to impacts unless it is coupled with one of the other types of transfers. Point of diversion changes may cause impacts if the change involves moving the diversion point a substantial distance upstream or downstream from the original point.

¹⁶⁷ One report acknowledges that perhaps the major policy challenge facing western states is how to assess and address third-party effects associated with water marketing programs. See, MacDonnell, L., Shifting the Uses of the Waters in the West: An Overview, in Moving the West's Water to New Uses: Winners and Losers. Proceedings of the 1990 Annual Summer Program. University of Colorado @ Boulder, Natural Resources Law Center, (1990).

¹⁶⁸ The economic effects of the California Drought Water Bank on the agricultural communities in the Sacramento area is outlined in Carter, D., et al. Sharing Scarcity: Gainers and Losers in Water Marketing, University of California: Davis, Agricultural Issues Center Report, (1994).

¹⁶⁹ The National Research Council, Water Transfers in the West (1992) book contains the most complete discussion of third-party impact analysis. The following discussion is extensively taken from that book.

¹⁷⁰ The California Water Bank transfers involved these three types of changes.

2. PARTIES AFFECTED

Depending on the type of transfer and immediacy of impact there is a hierarchical arrangement to the parties affected by the water transfer. Not all parties are affected equally by water transfers. In fact some parties are made better off by the transfers.

This hierarchy of parties is based on direct and indirect effects and is best illustrated by the studies of the California Drought Water Bank.¹⁷¹ The large amount of water reallocated from agriculture to urban uses under the California Drought Water Bank focused attention on the issue of third-party impacts. Agricultural interests in California were fearful that the marketing activities of the Bank would result in a significant decline in farming activity and employment as farmers opt to sell their water rather than grow crops. They argued that if farmers stop growing crops, they would also stop purchasing seed, fertilizer, hardware and other materials necessary for crop production. The loss of farm production caused by the water market, they argued, would undermine the agricultural foundations of the region.¹⁷²

¹⁷¹ See Mitchell, D., Water Marketing in California: Resolving Third-Party Impact Issues. The Bay Area Economic Forum, San Francisco, (1992).

¹⁷² *Id.* p. 3.

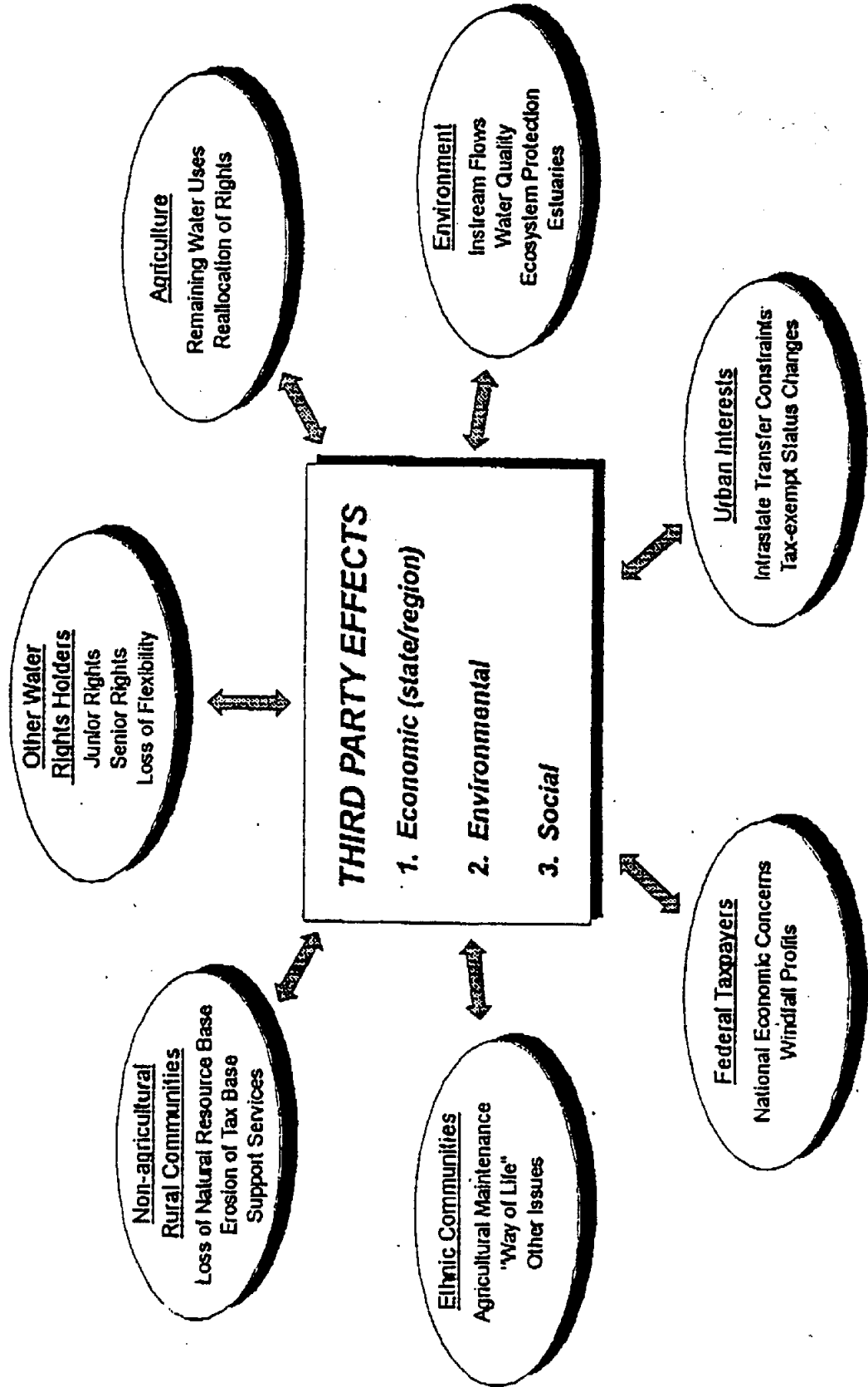
TABLE 3-1. THIRD-PARTY IMPACTS AND WATER TRANSFERS

<u>Type of Transfer</u>	<u>Nature of Effects</u>
Ownership	Economic (state/regional/local)
Point of Diversion	*Lost revenue
Purpose of Use	*Lost opportunities
Place of Use	*New revenue
Period of Use	Environmental
Out-of Basin	*Water quality
	*Instream flows
	*Estuary inflows
	*Wetlands
	*Riparian ecosystems
	*Fish & Wildlife
	Recreational
	*Boating/rafting/canoeing
	*Hunting & Fishing
	Social
	*Rural communities
	*Cities
<u>Types of Parties Affected</u>	
Other Water Rights Holders	
Agricultural Producers	
Agricultural Suppliers	
Rural Communities	
Ethnic Communities	
Municipalities	
Recreational Users	
Environmental Interests	
Taxpayers	

* As modified from National Research Council, Water Transfers in the West, p. 113.

FIGURE 3-1. THIRD-PARTY IMPACTS FRAMEWORK

NATURE OF THIRD PARTY EFFECTS AND AFFECTED PARTIES *



* After Water Transfers in the West: Efficiency, Equity, and the Environment, National Research Council, 1992, pg. 7.

3. TYPES OF EFFECTS

Positive and negative impacts of water transfers are often expressed in economic, environmental, recreational, and social terms. Economic effects, measured at the firm or sector level, include impacts on incomes, jobs and business opportunities which can have positive and negative contributions on local, regional and state economies. These effects can extend to the fiscal conditions of state and local governments.¹⁷³ Environmental effects include all of the physical, biological, and geological impacts associated with increased or decreased water flow that relate to the integrity of the river system. While ecosystem integrity is related to habitat maintenance, recreational impacts refer to the types and extent of effects on users and uses. This may include boating, rafting, fishing, hunting, and non-consumptive recreation activities. Social impacts tend to be non-economic, intangible and difficult to measure. Intangible impacts include changes in; (1) the quality of community life, (2) political empowerment, (3) connectedness to the land and (4) a sense of community.¹⁷⁴ Rural communities, individuals and the courts are taking stands to provide a modicum of legal protection for an agricultural lifestyle threatened by transfer of water rights.¹⁷⁵

¹⁷³ For example in La Paz County Arizona, the purchase of water farms (farms with appurtenant water rights) by one municipality removed 10 percent of the taxable land from its tax base. This potentially could increase county tax rates and place a heavier burden on remaining taxpayers. See Nunn, S., Ingram, H., Information, the Decision Forum and Third-Party Effects in Water Transfers, 24 *Water Resources Research* 473-480 (1988).

¹⁷⁴ The impact of water transfers on rural communities is difficult to characterize and document because no consensus exists about the value of these communities. Unless they are incorporated, they have no legal standing to protect their interests. See National Research Council, Water Transfers in the West, (1992), p. 45.

¹⁷⁵ In a celebrated New Mexico case involving the sale of 75 acre-feet of agricultural water rights to a ski resort, local irrigators challenged the transfers claiming that it was contrary to the public welfare. The trial court judge overturned the state engineers approval of the transfer finding that although the proposed ski resort would bring additional jobs that over the long run, the local inhabitants lose management jobs to outsiders and are relegated to tourism service jobs such as waiter and maids. The judge's ruling held that greater economic benefits are not always more desirable than preservation of cultural identity.

The trial judge was later reversed by the New Mexico court of appeals based on the fact

It has often been assumed that the effects of water transfers are negative, yet this is not always the case. For example, changing a diversion point to a location lower on a river may result in greater stream flows and positive environmental impacts on the river system.

There is a paucity of documentation on the actual effects and the magnitude of these effects resulting from transfers. One study found that third-party impacts, though a valid concern and deserving of attention, were overstated in the public debate.¹⁷⁶ In this study, the types of crops affected, the level of agricultural production disrupted, and the resulting employment loss were small compared to the historical fluctuations within agriculture. An employment loss in agriculture will be offset many times over by the creation of new jobs in urban areas.¹⁷⁷

II. STATE RESPONSES TO PUBLIC INTEREST CLAIMS

Several states require that water transfers may be subject to "public interest" reviews. These reviews serve as a means to consider public values and externalities in water transfers in much the same manner that the no-injury rule serves as a means to consider private externalities in the transfer process.¹⁷⁸ Indeed, this public interest rubric provides the basis for evaluating third-party impacts in water transfers.

that the specific public interest language was not added until after the application to transfer was filed. See *In re Application of Howard Sleeper*, 760 P.2d787 (N.M. 1988).

¹⁷⁶ Mitchell, D., Water Marketing in California, (1993), p. 11.

¹⁷⁷ *Id.*, p. 11.

¹⁷⁸ For a detailed and thoughtful article on the topic see Grant, Public Interest Review of Water Right Allocation and Transfer in the West: Recognition of Public Values, 19 *Arizona State Law Journal* 681 (1987).

Except for Colorado and Oklahoma, all of the western states and Alaska require "public interest" reviews for original applications¹⁷⁹ and most also apply the standard to transfers. These statutes vary considerably in outlining the criteria for public interest review and in granting regulatory agencies the discretion in defining the term. Some statutes simply require a public interest review without defining what is meant by the term. New Mexico, South Dakota, Nevada, and Texas allow a regulatory agency to reject a transfer application where the transfer is *detrimental to the public interest, not in the public interest, or threatens to prove detrimental to the public interest, or detrimental to the public welfare*.¹⁸⁰ These provisions do not suggest how the public interest is to be measured, leaving great discretion to the regulatory agencies.

1. PUBLIC INTEREST CRITERIA

A number of states have set standards in statutes and regulations to guide agencies and to give notice to the public of the scope and nature of public interest restrictions. The Alaska statute requires that the commissioner consider these criteria in evaluating a permit:

- (1) the benefit to the applicant resulting from the proposed appropriation,
- (2) the effect of the economic activity resulting from the proposed appropriation,
- (3) the effect on fish and game resources and on public recreational opportunities,
- (4) the effect on public health,

¹⁷⁹ See Alaska Stat. 46.15.080; Ariz. Rev. Stat. Ann §45-153; Cal. Water Code, §§1255-1258; Idaho Code §42-203(A); Kan. Stat. Ann. §82a-711; Mont. Code Ann. §85-2-311(2); Neb. Rev. Stat. §§46-234, 46-235, 46-2,116; Nev. Rev. Stat. Ann. §533.370; N.M. Stat. Ann. §72-5-6; N.D. Cent. Code §61-04-06; Or. Rev. Stat. §537.170(4), (5); S.D. Codified Laws Ann. §46-2A-9; Tex. Water Code §11.134(3); Utah Code Ann. §73-3-8; Wash. Rev. Code Ann. §90.03.290; Wyo. Stat. §41-4-503.

¹⁸⁰ Respectively N.M. Stat. Ann. §72-5-23; S.D. Codified Laws Ann. §46-2A-12; Nev. Rev. Stat. §533.370 and Tex. Water Code §11.134.

- (5) the effect of loss of alternative uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation.
- (6) harm to other persons resulting from the proposed appropriation,
- (7) the intent and ability of the applicant to complete the appropriation, and
- (8) the effect upon access to navigable public water.¹⁸¹

California combines environmental and economic criteria in its water transfer statute. The Water Resources Control Board may approve a transfer only if it finds, in addition to non-impairment, that the change can be made without unreasonably affecting fish, wildlife, or other instream uses and does not unreasonably affect the overall economy of the area from which the water is being transferred.¹⁸²

A more precise statutory enumeration of public interest criteria serves to guide the water agency and does not hinder it in developing administrative rules to interpret legislative intent. Specific criteria are most helpful in defining what should not be considered in determining public interest.¹⁸³

2. WEIGHING PUBLIC INTEREST CRITERIA

A most difficult issue in public interest reviews is determining how to weigh the factors. Should each factor be proportionally weighed or is there a priority among the factors that requires one to be given greater importance than another? One commentator notes that even those statutes that give considerable guidance regarding specific criteria offer little help on how to weigh them.¹⁸⁴ While case law offers little guidance, preference statutes and area-of-origin statutes provide some insight on weighing of criteria. The Nebraska interbasin transfer statute provides

¹⁸¹ Alaska Stat. §46.15.080.

¹⁸² See Cal. Water Code §386.

¹⁸³ For a discussion of the Texas public interest criteria see Chapter IV, Section II.

¹⁸⁴ Grant, Public Interest Review of Water Right Allocation and Transfer in the West: Recognition of Public Values, 19 *Arizona State Law Journal* 681 (1987).

that transfer applications "shall be deemed in the public interest if the overall benefits to the state and the applicant's basin are greater than or equal to the adverse impacts to the state and the basin of origin."¹⁸⁵

In spite of some criticism over the inadequacy of the administrative agency/judicial forum in water transfers, the issue over weighing is best resolved by using the existing regulatory structure.¹⁸⁶ In this forum, public interests are weighed and resolved by a hearings examiner whose decision is subject to judicial review. The party seeking to have a transfer approved should have the burden of proving that the reallocation will not impair public rights. Of course, the regulatory official bears the ultimate burden of deciding whether the transfer is in the public interest and must support that decision with sufficient evidence. This decision is reviewable in a judicial forum.

III. LEGAL ISSUES

A water right acquired under the appropriation doctrine becomes a vested, perfected property right¹⁸⁷ and is entitled to protection against interference from other water users. As with other property rights, a water right may be conveyed to others. This right is not an absolute right but a qualified right--qualified in that it is subject to redefinition and change by state law. While the general trend in the West is to allow for the transfer of water rights, there are some legal limitations on these transfers. The following section discusses some of these limitations.

1. LEGAL PROHIBITIONS TO TRANSFERS

Transfer prohibitions or restrictions are largely a matter of legislative

¹⁸⁵ Neb. Rev. Stat. §46-289.

¹⁸⁶ Some commentators suggest that a water planning process is more likely to arrive at a fair determination of the nature of public welfare in that it allows the communities affected to participate. See Dumas & Minnis, *New Mexico Water Law: Determining the Public Welfare Values in Water Rights Allocation*, 31 *Arizona Law Review* 817 (1989).

¹⁸⁷ See *Hunter v. United States*, 388 F.2d 148, 153, (9th Cir. 1967).

enactments and can make market-based transfers difficult or expensive to establish. Only the state of Wyoming appears to have a legal prohibition to water rights transfers.¹⁸⁸ The statute, however, is so riddled with exceptions as to be more of a nuisance than a prohibition.¹⁸⁹ Texas law does not prohibit transfers.

2. NO-INJURY RULE

Whenever a water rights holder seeks to transfer water, or to change the place, purpose or time of use, special protection rules for other appropriators apply. While the public interest review provisions are intended to protect third-parties, the "no-injury" rule is intended to protect junior appropriators. The rule seeks to protect junior appropriators from changes in water quality, quantity and in the timing of the delivery of water. It was originally developed in case law but it has been statutorily adopted in all of the prior appropriation states.¹⁹⁰

The most common concern in this rule comes from junior irrigators who are largely interested in insuring return flows, principally for agriculture. They are concerned about injury resulting from an increase in consumptive use of water.¹⁹¹ Although somewhat of an oversimplification, the rule limits the amount of water that can be transferred to the amount of water historically consumed, thereby preserving return flows for downstream appropriators. In this way it is argued that the rule promotes economic efficiency by allowing only those transfers which result

¹⁸⁸ See Wyo. Stat. §41-3-101.

¹⁸⁹ See Trelease & Lee, Priority and Progress--Case Studies of the Transfer of Water Rights, 1 *Land and Water Law Review*, 1 (1966).

¹⁹⁰ See Tex. Water Code §11.134

¹⁹¹ Consumptive use may be defined as "diversions less returns, the difference being the amount of water physically removed from the stream." For different definitions see Jensen, Burman, Allen eds., Evaporation and Irrigation water Requirements. ASCE Manual and Reports on Engineering Practices No 70 5-6. American Society of Civil Engineers (1990).

in economic gain to society.¹⁹² While the rule is not without critics¹⁹³ it will undoubtedly remain unchanged. Elimination of the rule would raise serious political, statutory and constitutional questions.¹⁹⁴

A no injury standard raises four issues that must be addressed in the transfer process. Protecting existing rights in a transfer involving a change in point of diversion, use, return flow, is the first dimension to the constraint problem. The second dimension to the rule deals with the type of injury suffered by other appropriators. Some of the common types of injury to appropriators are:

1. A change in use from nonconsumptive to consumptive so as to deprive junior appropriators of return flows;
2. A change in the point of diversion from below to above a junior so as to deprive the junior of water;
3. A change in the point of diversion from above the junior to below the junior, or a transfer of water into another basin, so as to deprive a junior of return flows;
4. A change from direct flow to reservoir storage where the burden of evaporation, infiltration or phreatophyte loss is placed on the junior; and
5. A change in the point of diversion on a losing stream from above the junior to below the junior so as to place the burden for the water loss on the junior.¹⁹⁵

Of course, there is no injury from a reallocation when downstream appropriators still have sufficient water at their points of diversion to satisfy their rights.

¹⁹² Meyers & Posner, Market Transfers of Water Rights: Toward a Improved Market in Water Resources, National Water Commission, Legal Study No. 18-25, (1971), p. 27.

¹⁹³ See Sax, J. Water Law: Cases and Commentary, 207 (1965); Gould, Water Rights Transfers and Third-Party Effects, 23 *Land & Water Review* 18, 23 (1988).

¹⁹⁴ Specifics on the No-Injury rule in Texas are presented in Chapter IV.

¹⁹⁵ See Trelease, Changes & Transfers of Water Rights, 13 *Rocky Mtn. Min. L. Inst.* 507, 519 (1967).

A third dimension of the no-injury rule relates to measuring the extent of injury and in determining who has the burden of proof. If the rule is interpreted as a zero tolerance standard, a *de minimis* injury, such as mere inconvenience to others, will impede market based transfers. Clearly, the injury must substantially affect the vested rights of juniors to the use of water. Closely related to measuring the extent of the injury is the issue of burden of proof of injury. In most states the no-injury rule places a heavy burden on the applicant to show absence of injury. This burden increases the transaction costs of transfers and makes uncertain the results until the transfer is completed.¹⁹⁶ Perhaps the burden of proof should be shifted to other users on the stream.

3. RESTRICTIONS ON INTERBASIN TRANSFERS

Removing water from one watershed to be used in another is generally permitted under the prior appropriation doctrine. Transbasin transfers most often are sought when economic and population growth occur in basins where supplies are inadequate and there is surplus water available in other basins. Because the effects of substantial exports of water tend to be severe and long lasting in the basin of origin some states have imposed statutory restrictions on interbasin transfers to protect areas of origin. The National Water Commission found no parallel for other resources and concluded that a free market is inadequate to account for the external costs associated with water use. They concluded:

Area-of-origin protection is peculiarly associated with water. Other resources are not similarly treated, probably because they are priced in conventional markets. For coal, oil, copper, timber, and other natural resources, the area of origin receives its "protection" in the form of taxes and revenues from the "export" of the resource. In the absence of a pricing system for the export of water, area-of-origin interests have resorted to the political process to obtain "in kind" protection, that is, enactment of laws reserving water for the area's "ultimate requirements" or providing for recapture in the event of future need. As a consequence of this approach, safeguards for a water exporting area have usually been tied to future or potential water development in the area.¹⁹⁷

¹⁹⁶ See Gould, Water Rights Transfers and Third-Party Effects, 23 *Land & Water L. Rev.* 1, 30 (1988).

¹⁹⁷ National Water Commission, Water Policies for the Future, (1973), p. 323.

While area-of-origin protection rules add transfer costs they are defended because of the severe effects on the economy, ecology, culture, lifestyle and potential for future growth in the originating basin.

A. Background on Restrictions

Water is considered to be a vital natural resource essential to our existence. Accordingly, the philosophies and laws that have evolved regarding the property rights of water have a number of characteristics that are not found in the property rights of other natural resources. One of the most important characteristics, related to surface water, is the perceived need for area-of-origin protection. Numerous adverse impacts have been identified as resulting from water transfers. These include economic effects, social changes, as well as environmental effects. Various laws have been enacted with the purpose of protecting the area-of-origin from the effects of water transfers/diversions that result in a change in the place of use of the water. These laws are diverse and vary from state to state depending in part on how "area-of-origin" is defined and how water law evolved in each state. Unlike other protectionist statutes like the no-injury rule, area-of-origin statutes are intended to safeguard the needs of the entire community, not just other water users.

B. Riparian Law Restrictions

Perhaps the most extensive and pervasive forms of area-of-origin protection arose from the common law riparian doctrine. Under this doctrine, a landowner is vested with water use rights strictly based on the ownership of land adjacent to a river (flowing surface water body). Riparians are generally free to use the water for any beneficial purpose, but are restricted from using it in such a manner as to diminish the quality or quantity of water to lower riparians. An additional restriction required riparians to return any diverted unconsumed water back to its natural watershed.¹⁹⁸ This particular requirement has been weakened over time due to the demands of population increases and increasing emphasis on urban needs. Although these rules were intended to protect only other riparian

¹⁹⁸ *Id.* p. 323.

landowners, they inadvertently protected communities within a given watershed. Since a riparian could not transport the water away from the original basin, local communities were able to enjoy the economic benefits resulting from water use by riparians.

C. Local Public Interest Concerns

The early antecedents of area-of-origin protection in states that adopted the prior appropriation doctrine arose from concerns surrounding the effects of numerous, large water diversion projects. As more water was transported from rural areas to growing urban centers, "local public interest concerns" were raised over perceived negative economic effects.¹⁹⁹ The adverse effects, in areas heavily dependent on agriculture include: unemployment, loss of tax base, business failures, loss of farm income and decreased standard of living.

California was the first state to enact legislation providing area-of-origin protection with the passage of the "county-of-origin" statute in 1931.²⁰⁰ This law was passed in response to northern Californian's concerns regarding plans to redistribute water from the northern to the southern part of the state. As part of the Central Valley Project Act of 1933, California passed a watershed-of-origin statute. In response to similar concerns, many western states have passed some form of area-of-origin protection legislation. Most of these statutes are based on "in kind" protection. This usually provides for either the right of the area-of-origin to "recapture" the water at some time in the future, or to be compensated for its continued loss.²⁰¹

As a result of the possible adverse economic impacts resulting from water transfers, the social fabric of rural communities may undergo a certain amount of

¹⁹⁹ Beck, Water and Water Rights, (1991), p. 301.

²⁰⁰ *Id.*, p. 307.

²⁰¹ National Research Council, Water Transfers in the West, (1992), p. 79.

change.²⁰² When the local/regional economy begins to downsize, fewer and fewer job opportunities will be available for the local population resulting in an exodus of the younger, working age inhabitants. As people migrate away from rural areas toward jobs, the characteristics of small agricultural communities will change.

D. Environmental Impacts

Only over the last two to three decades has much interest been shown in protecting the environment from impacts stemming from water transfer/diversion projects. As knowledge of environmental interrelationships has grown the benefits of some water projects have been questioned. Negative environmental effects from water transfers include diminished instream flows, loss of wildlife and fish resources, and reduced water quality. More recently instream flow uses such as recreation are starting to be accepted as valid water uses and as such requiring protection in their own right. Water quality is also considered in area-of-origin protection. Several states include requirements for the protection of water quality standards, environmental health and public health issues in their area-of-origin protection statutes.²⁰³

E. State Statutory Protection

Area-of-origin provisions of some type can be found in the statutes of most prior appropriation states. The provisions can be divided into four categories: (1) prohibitions; (2) severe to moderate restrictions; (3) transfers with recapture or reservation terms; and (4) transfer of only surplus water.²⁰⁴

²⁰² Many social and economic changes in small towns and rural areas have occurred for quite some time as a result of broader transitions in the regional, state or national economy.

²⁰³ Beck, Water and Water Rights, p. 315..

²⁰⁴ Some writers suggests that area-of-origin restrictions can be divided into three categories: (1) prohibition or restriction, (2) allocation, and (3) compensation. See MacDonnell & Howe, Area-of-Origin Protection in Transbasin Water Diversions: An Evaluation of Alternative Approaches, 57 *Univ. of Colorado L. Rev.* 527, 533 (1986) and MacDonnell, Howe, Corbridge & Ahrens, Guidelines for Developing Area-of-Origin Compensation. A Research Report of the Colorado Water Resources Research Institute, University of Colorado, Boulder, (1985). The following discussion draws extensively from the second article.

1. *Prohibitions.* States that follow this rule seek to keep the water in the watershed to preserve and protect the economic, environmental, cultural, and other *in situ* values within the watershed. Examples can be found in the statutes of Arizona and Montana.

Under Arizona law, agricultural interests are protected from interbasin transfers because water providers in the watershed are given a veto right over all transfers. The statute provides:

No right to the use of water on or from any watershed or drainage area which supplies or contributes water for irrigation of lands within an irrigation district, agricultural improvement district or water users association shall be severed or transferred without the consent of the governing body of such irrigation district, agricultural improvement district or water users association.²⁰⁵

The restriction is nearly absolute as there are no reported cases involving this law.

A Montana statute provides that only the Department of Natural Resources and Conservation is authorized to appropriate water for export out of the state's six major river basins.²⁰⁶ While the statute is often perceived as a state marketing device, it offers near absolute area-of-origin protection since only the state can move the water.

2. *Severe to Moderate Restrictions.* Several states allow interbasin transfers but impose varying restrictions on the process to insure that public and local interests are considered in the transfer decision. Among the states that follow

²⁰⁵ Ariz. Rev. Stat. Ann. §45-172(5).

²⁰⁶ Mont. Code Ann. §85-2-301(2)(1).

this approach are Kansas²⁰⁷, Idaho²⁰⁸, Nebraska²⁰⁹, Nevada,²¹⁰ Oklahoma,²¹¹ Oregon,²¹² Texas, and Wyoming.²¹³

In Kansas small transfers are allowed without much restriction while larger transfers require positive benefits/cost calculation before approval. Diversions of over 1,000 acre-feet of water per year transported a distance of 10 miles or more from the point of diversion require greater scrutiny.²¹⁴ Such diversions are not allowed if *"they would reduce the amount of water required to meet present or reasonably foreseeable future uses of water by present or future users in the area from which the water is to be taken for transfer, unless the benefits to the state for approving the transfer outweigh the benefits for disapproving the transfer, or an emergency exists which affects the public health, safety, or welfare."*²¹⁵

207 Kan. Stat. Ann. §82a-1502 [certain determinations must be made by the agency to insure that the transfer would not reduce the amount of water needed to meet beneficial uses in area-of-origin.]

208 Idaho Code §42-222. [administrator must consider the local public interest and shall not approve a change in the nature of use from agriculture use where such change would significantly affect the agricultural base of the local area. Administrator may attach conditions to permit to mitigate any impacts.]

209 Neb. Rev. Stat. §46-289.

210 Nev. Rev. Stat. Ann. §533.363 [county commissioners in originating basin must be notified of proposed transfer.]

211 Okla. Stat. tit. 82, §1086.1.

212 Or. Rev. Stat. §537.803.

213 Wyo. Stat. §41-3-104. [Board of control must consider the economic loss to the community and state in evaluating transfer from area-of-origin].

214 Kan. Stat. Ann. §§82a-1501 to 1506.

215 *Id.* §82a-1502.

3. *Transfers with Recapture Provisions.* This approach seeks to grant the originating basin a priority right to the water when it becomes necessary for development, but it allows the water to be exported to another basin until the basin of origin "needs" the water. When the originating basin needs the water the transfer contracts and rights are revoked.

This approach adds substantial uncertainty to a state system of water rights. Large water projects require reasonable certainty as to project life to assure adequate financing for the life of the project. Further, when areas become dependent on imported water they are likely to resist giving up this water, which could lead to further legal and political conflict. The system may work if it is unlikely that the areas of origin will ever develop the need for the water or develop the political clout to take it away from the importers.

California follows this approach by providing a "right of recapture" against the users of exported water conditioning all exported water rights by giving users in the county of origin a right to recapture exported water at any time the water becomes necessary for the development of the county.²¹⁶ The system has worked well up to this point because of the slow economic and population growth in the Sierra Nevada mountain range in Northern California.

4. *Transfers of Surplus Water.* This is a variant of the restrictive and recapture transfer approaches in that only "surplus water" is allowed to be exported. Exporting basins retain that amount of water needed to meet their needs for economic development and environmental protection. This approach presents problematic concerns over defining what is meant by "surplus water." If the standard is set at an extreme level, very little water will be available for transfer.²¹⁷

²¹⁶ Cal. Water Code. §10505.

²¹⁷ Texas has set the level at such a point so as to "lock-up" water for a near economic eternity. See Johnson & Knippa, *Transbasin Diversion of Water*, 43 *Texas Law Review*, 1035, 1051 (1969) [termed derisively as the fifty-year lockup].

California, New Mexico, Oklahoma and Texas²¹⁸ follow this approach in dealing with interbasin transfers. The New Mexico²¹⁹ and Oklahoma²²⁰ statutes allow water to be transported out of the basin provided there is a reasonable amount of water available to meet local needs. Oklahoma reviews their needs every five years.

F. Marketing Conserved Water

As discussed in Chapter II, conservation strategies seek to remove disincentives and to create incentives to conserve water through (1) requiring appropriators to use the best practicable technology to reduce water use, (2) subsidies to appropriators to purchase new technology, or (3) allowing the conservor to sell the salvaged water. Market proponents argue that the marketplace will eliminate waste and non-beneficial uses of water if rights to the salvaged water are defined and transferable. Accordingly, economic self-interest, based on the ability to sell salvaged water, will promote the efficient use of water.

Appropriation rights to salvaged water are not easily resolved under case law. If the conserved water by its flow or seepage naturally enters a watercourse, it would be considered state water subject to reappropriation by the state. However, if the salvaged water can be captured before it leaves the appropriators property, and it was not previously derived from state water, it could be sold by the appropriator. Between these two extremes lies a large area of factual and legal uncertainty in which the classification of water is not clear.

²¹⁸ For a more detailed discussion of the Texas approach *see* Chapter IV, Section III, B, 3.

²¹⁹ N.M. Stat. Ann. §72-5-29. [the statute recognizes a residents natural right to a reasonable share of water from the stream].

²²⁰ The Oklahoma Statute provides:

In the granting of water rights for the transportation of water for use outside the stream system wherein the water originates, applicants within such stream systems shall have a right to all of the water required to adequately supply the beneficial needs of water users. therein. The board shall review the needs within such area of origin every five years. (Okla. Stat. tit. 82, §105.12(4).).

The technology exists to bring about substantial savings in the use of water for agriculture. Modern sprinklers, drip irrigation systems, concrete ditch lining, laser leveling of fields and phreatophyte (brush) control can bring about substantial water savings. If the water saved through using these methods could be used or sold by the conservor, this could justify investments in the new technology. Case law suggests that any salvaged water belongs to the state and not to the person who conserved it.²²¹

The rule that salvaged, or conserved water, belongs to the state and not to the appropriator who saved it is a major disincentive to conserve. Conversely, if the conservor could use, or sell, the salvaged water this would encourage water conservation and it would promote water marketing.²²² California and Oregon have recently adopted this approach to allow conservors to have title to the salvaged water.²²³ The Oregon statute recognizes that instream flows could be adversely affected by this program and therefore requires that 25 percent of the conserved water must remain in the stream. The conservor has the right to sell the remaining 75 percent of the conserved water.²²⁴

G. Dormant Public Trust Doctrine

The public trust doctrine may play a significant role in water reallocations and transfers when the transfers do not protect environmental values. The celebrated Mono Lake case in California raises interesting questions about the security of senior water rights holders in that it implies a limitation in every water permit, no matter

²²¹ See *Salt River Valley Water Users Assoc. v. Kovakovich*, 411 P.2d 201 (Ariz. Ct. App. 1966) and *Southwestern Colorado River Water Conservancy District v. Shelton Farms*, 529 P.2d 1321 (Colo. 1974); *R.J.A., Inc. v. Water Users Ass'n of District No. 6*, 690 P.2d 823 (Colo. 1984)

²²² See McCarl, Griffin, & Kaiser, Brushland Management for Water Yield:Prospects for Texas. A Report of the Texas Agricultural Experiment Station, B-1569, College Station, pp. 49-50, (1987).

²²³ Cal. Water Code §§ 1010, 1011(b); Oreg. Rev. Stat. §537.455.

²²⁴ Oregon Rev. Stat. §537.470. Information on the amount of water allocated to instream flow in Oregon was not available.

how long established, to carry out the state's public trust duties.²²⁵ In that case, the California Supreme Court ruled that a 1940 permit allowing the City of Los Angeles to take water from the streams feeding Mono Lake had been granted without considering the effect on public trust factors, including the environmental amenities of Mono Lake. The Supreme Court remanded the case to the lower court for a determination of the extent to which senior right holders diversions of water would have to be curtailed in order to protect the environmental integrity of Mono Lake.

With the advent of the public interest review process and criteria for water transfers, the potential for judicial review of agency decisions is reduced. If a state considers environmental factors in its public interest, the need for public trust review by the courts is obviated.²²⁶

H. Determining the Quantity of Water to be Transferred

It is axiomatic that the quantity of water that can be transferred may not exceed the amount held by the transferor. This means that the upper limit for a transfer is probably set at the quantity stated in the permit with the lower limit set at the amount of historic consumptive, or beneficial use.²²⁷ Uncertainty exists as to which of these two amounts can be transferred. This uncertainty is caused by the past practice of setting paper rights at an excessive level or from not using the amount of permitted water in a beneficial manner.

It appears to be the general rule that the limit on the quantity of water that can be transferred is to be no greater than the historical consumptive, or beneficial

²²⁵ National Audubon Society v. Superior Ct., 658 P.2d 709 (Cal. 1983).

²²⁶ The values that public trust doctrine seeks to protect are best accommodated in comprehensive water planning processes and through public interest review of transfers. See National Research Council, Water Transfers in the West, (1992), p. 102.

²²⁷ This point has not been judicially settled in Texas.

use.²²⁸ Consumptive use may be defined as "diversions less returns, the difference being the amount of water physically removed from the stream system through various uses."²²⁹ In Wyoming the amount of water that can be reallocated is limited to the historic beneficial use.²³⁰

²²⁸ See *Green v. Chaffee Ditch Co.*, 371 P.2d 775 (Colo. 1962); *Basin Electric Power Co-op v. State Bd of Control*, 578 P.2d 557 (Wyo. 1978).

²²⁹ For different scientific definitions of consumptive use see Jensen, Burman & Allen eds., Evapotranspiration and Irrigation Water Requirements. ASCE Manuals and Reports on Engineering Practice No. 70, American Society of Civil Engineers, pp 5-6 (1990).

²³⁰ Wyo. Stat. §41-3-104.

CHAPTER THREE SUMMARY

Certain factors must exist to enable water to be marketed. These factors are: fully appropriated water supplies; physical, fiscal or political limitations on developing new supplies; current water uses in low valued agricultural uses; and increasing municipal and industrial demands for higher valued water.

Consideration of the third-party impacts in water transfers is critical. Ownership of the water right, point of diversion, place of use, purpose of use, period of use, and basins of origin can all potentially impact third-parties. Third-party impacts are felt by other water rights holders, agricultural producers and suppliers, rural communities, ethnic communities, municipalities, recreational users, environmental interests, and taxpayers.

In some states, water transfers may be subject to "public interest" reviews. Standards have been established to address environmental and economic criteria, and these criteria help guide the water agencies. The difficulty lies in how to prioritize the criteria. Whether the reallocation will impair public rights is usually determined by a regulatory official, and the decision may be reviewed in the courts.

Concerns of junior rights holders are protected somewhat by the no-injury rule, which preserves return flows for downstream appropriators. Transbasin transfers are another major issue for junior appropriators. Area-of-origin protection safeguards water resources for a given area by restricting export of that water to another region. Environmental concerns have also been a factor in promoting area-of-origin restrictions.

Elimination of waste and non-beneficial uses can be promoted by marketing salvaged water. State ownership of salvaged water provides no incentives to conserve; ownership by the conservor would promote water conservation and marketing. Other regulatory barriers to marketing exist. The public trust doctrine allows the court to prevent a reallocation to protect environmental values and the "general welfare". Water quantity limits are imposed upon transfers within the permitting process.

CHAPTER IV. ANALYSIS OF TEXAS WATER LAW RELATED TO WATER TRANSFERS AND MARKETING

I. NATURE OF TEXAS APPROPRIATIVE RIGHTS

Title to surface water in Texas is held in trust by the state. A holder (appropriator) of a water right does not have title to the water but only has a state license, or permit, to use and enjoy the water. A water permit is a vested property right which entitles the appropriator to certain protection against termination²³¹, loss²³² or infringement.²³³ A vested right however is subject to regulation by the state under its police powers. In granting a vested right (permit) the Texas Natural Resource Conservation Commission, hereinafter Commission, may place restrictions and conditions on that right in order to protect the priority of seniority water rights or environmental values.²³⁴

II. OBTAINING A WATER RIGHT UNDER THE EXISTING SYSTEM

Historically, in order to have a valid appropriation water must be *diverted* with an *intent* to appropriate it for a *beneficial use*. Texas law incorporates these three requirements and adds new provisions that must be satisfied by the applicant. A person seeking to appropriate water may obtain a permit if, after filing an appropriate application, payment of fees, notice and hearing, the Commission finds that:

²³¹ See Tex. Water Code §11.033 (eminent domain). A vested water right requires that compensation be paid if it is condemned in appropriate proceedings.

²³² *Id.* § 11.172.

²³³ *Id.* §§ 11.081-.083. Interfering with or impairing a water right without improper authority is unlawful.

²³⁴ *Id.* §11.147 (b), (d), (e).

- (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.²³⁵

In addition the Commission must also assess the effects, if any, of the issuance of the permit on:

- (1) bays and estuaries;²³⁶
- (2) existing instream uses;²³⁷
- (3) fish and wildlife habitat;²³⁸ and
- (4) water quality.²³⁹

While each of these findings represents a potential point of dispute in a contested hearing, once the positive findings are made, the Commission must grant the application and issue the permit.

1. AVAILABILITY OF UNAPPROPRIATED WATER

This requirement may be a source of controversy in water permit applications as the Commission must decide if unappropriated water is actually available in the source of supply. Generally, the quantity of water specified in the permit is not guaranteed. An appropriator is limited to the quantity of water applied to a beneficial use. If the appropriator does not ultimately use the quantity claimed in the permit, the excess is not considered appropriated. Thus, the difference between the permitted amount and the amount beneficially used could be

²³⁵ *Id.* § 11.134

²³⁶ *Id.* §11.147(b)

²³⁷ *Id.* §11.147 (d).

²³⁸ *Id.* §11.147(e) and §11.152.

²³⁹ *Id.* §§11.147(d), 11.150.

considered available for appropriation, however, this is not the case. The Texas Supreme Court has ruled that "unappropriated water" means the amount of water remaining after taking into account complete satisfaction of all existing uncanceled permits and filings valued at their recorded (permitted) levels.²⁴⁰ The Court held that by not fully recognizing a permitted right the Commission was terminating a vested property right and that can only be done through cancellation proceedings.

While application of this rule for "unappropriated water" suggests that no water is legally available for appropriation, in actuality, unappropriated water is available. Even though the normal flow of the river may be fully appropriated, water may still be available during times of abundance or flood. No statutory or regulatory mechanism exists to determine how frequently water must be available above normal flow to support a finding of the availability of unappropriated water.

2. BENEFICIAL USE

An important step in perfecting an appropriation is the application of the water to a beneficial use. Once an appropriator puts water to a beneficial use the right is perfected and becomes a vested property right. Certain beneficial uses are specifically defined in the Texas Water Code and others are covered by a catch-all provision. The statutory list of beneficial uses of water include domestic, municipal uses, industrial, irrigation, mining, hydroelectric power, navigation, recreation and pleasure, stock raising, public parks, and game preserves.²⁴¹ The Code includes a catch-all provision that water can be used for any "other beneficial use"²⁴² which

²⁴⁰ Lower Colorado River Authority v. Texas Department of Water Resources (Stacy Dam) 689 S.W.2d 873 (Tex. 1984). A staff study of the river indicated that very little water would be available for appropriation at the proposed reservoir site, given full exercise of all senior rights and that downstream lakes would be adversely affected. The Texas Water Commission rejected the staff conclusion by assuming, based on historical data, that the maximum amount of water claimed under senior rights had never in fact been used. The Supreme Court found that the staff used the appropriate analysis.

²⁴¹ Tex. Water Code § 11.023 (a).

²⁴² *Id.* § 11.023 (b).

has been defined as "use of the amount of water which is economically necessary for a purpose authorized by this chapter, when reasonable intelligence and reasonable diligence are used in applying the water to the purpose."²⁴³

In addition to being used to perfect a water right, the beneficial use doctrine is used to establish the amount of water that can be appropriated. Water taken in excess of the amount authorized under the permit, or in excess of that needed for the authorized beneficial use, is considered unappropriated surplus water that must be returned to the stream.²⁴⁴ Thus, the amount of water that can be taken under a permit is limited to the amount of water that can be beneficially used.

3. NON-IMPAIRMENT OF EXISTING RIGHTS

To the extent that a proposed appropriation would impair water availability for existing downstream rights, restrictions on the diversion point, and the timing of the diversion may be included in the permit. A typical restriction would limit diversions under the new permit when the flow of the stream at the diversion point is less than a specific cubic feet per second.

4. PUBLIC WELFARE CONSIDERATIONS

Factoring this requirement into a permit requires consideration of the environmental, social, and economic impacts of the proposed appropriation.²⁴⁵ The Commission must assess the effects of habitat mitigation, water quality, estuarine impacts and instream uses in considering a permit to store, take or divert state waters.²⁴⁶

²⁴³ *Id.* § 11.002 (4).

²⁴⁴ *Id.* § 11.046.

²⁴⁵ *See* 31 Tex Admin. Code §§ 297.49-52

²⁴⁶ *Id.*

5. CONSERVATION MEASURES

In 1985, the Texas legislature, recognizing that conserving water may be a less expensive alternative to developing new supplies, required that conservation considerations be a factor in granting or denying a permit to appropriate water.²⁴⁷ Conservation considerations include "those practices, techniques, and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses."²⁴⁸

Applicants for a permit must demonstrate reasonable diligence in achieving conservation. This may include the adoption of a conservation plan and the use of best management practices to prevent loss and waste.

III. LEGAL CONSIDERATIONS IN TRANSFERRING WATER RIGHTS

Texas, along with all other prior appropriation states, recognizes that an appropriative water right, being a property right, is alienable and transferable without loss of priority.²⁴⁹ A transfer is any change in ownership, point of diversion, place of use, purpose of use, time of use, or basin of use. While there are important legal and practical distinctions between the type and form of the transfer, the term transfer generally describes any voluntary physical or ownership change in all or part of an appropriative water right.²⁵⁰ This transfer right provides for certainty, consistency and predictability in reallocating and managing a scarce resource. For a listing of transfer provisions in other states see Table 4-1. Texas

²⁴⁷ Tex. Water Code § 11.134(4).

²⁴⁸ *Id.* § 11.002(8).

²⁴⁹ *Id.* §11.122.

²⁵⁰ Many terms have been used in the literature to describe the changes in the physical use or in the ownership of water. Terms such as reallocation, exchange, water marketing, dry year options, temporary reallocations, subordination agreements, leases and full rights sales appear in the literature.

transfer law recognizes and encourages a market-based reallocation of water by defining enforceable property rights in water and by allowing those rights to be sold, leased, or transferred to another person.²⁵¹

²⁵¹ Economists generally recognize four prerequisites for a market-based allocation model: (1) defined and enforceable property rights; (2) exclusivity of rights; (3) comprehensive attributes; and (4) transferability of rights. Colby, B & D. Bush, Water Markets in Theory and Practice: Market Transfers, Water Values and Public Policy, 1987, p. 23.

TABLE 4-1 SUMMARY OF STATE TRANSFER (REALLOCATION) LAWS*

State Code	Change in Place of Use	Change in Diversion Point	Change in Purpose of Use	Change in Storage Place
Alaska Stat	§46.15.160	Case law	§46.15.160	
Ariz. Rev. Stat. Ann	§45-172 §45-172	§45-156	§45-172	
Cal. Wtr Code	§§1701, 1706 1706	§§1700, 1701	Same	
Colo Rev. Stat.	§§37-92-103 37-92-302	Same	Same	§39-92-103
Idaho Code	§§42-108, 42-122	Same	Same	
Kan. Stat.	§82a-708b	Same	Same	
Mont. Code	§§85-2-102 85-2-402	Same	Same	Same, §85-2-404
Neb. Rev. Stat.	§46-290 to 46-294	§46-250		
Nev. Rev. Stat.	§533.325	Same	Same	
N. M. Stat.	§72-5-23	§§72-5-24, 25	§72-5-24	§72-5-25
N.D. Cent. Code	§61-04-15	§61-04-15.1	Same	
Okl. Stat tit. 82	§105.22	§§105.10 105.23	§105.23	§1205.23
Or. Stat.	§540.510	Same	Same	
S.D. Code Laws	§§46-2A-12 46-5-30.4	§46-5-13.1	§46-5-30.4	§46-5-31
Tex. Wtr Code	§11.122	Same	Same	
Utah Code	§ 73-3-3	Same	Same	
Wash Code	§90.03.380	Same	Same	
Wyo Stat.	§41-3-104	§§41-3-114&329	§41-3-104	

*Derived from Beck, R(ed), Waters and Water Rights, The Michie Co, Charlottesville, (1991), pp.267-268.

1. COMMISSION APPROVAL

All transfers of appropriative water rights require approval of the Commission through an application process²⁵² similar to that required for an original permit application. The Commission must apply the beneficial use, protection of existing rights, avoidance of waste, conservation, environmental protection and public welfare criteria of the Code in approving or denying the transfer application.²⁵³ Restrictions may be added to the transfer permit to protect minimum stream flows and to protect environmental water needs.²⁵⁴ While it is undisputed that all transfers require Commission approval, the complexity of the approval process varies depending on the physical characteristics of the transfer.

2. LEVELS OF ADMINISTRATIVE COMPLEXITY

Two patterns of administrative complexity are possible based on the public notice and hearing requirements. This has import to water transfer transaction costs which may have a significant impact on water marketing. Generally, those transfers which involve a change in ownership or no significant change in physical use are the least complex and may be granted by the Commission without notice or hearing. Thus, these transfers will potentially have lower transaction costs and an increased potential for market transfers. However, those transfers involving a physical change such as an increase in consumptive use or a change in the point of diversion, place, purpose, or time of use require public notice and a hearing.²⁵⁵ Transaction costs for these types of transfers may be much greater and could hinder

²⁵² See Tex. Water Code § 11.122 and 31 Tex. Admin. Code § 295.71.

²⁵³ In *Clark v. Briscoe Irrigation Co.*, 200 S.W.2d 674, 682 (Tex. Civ. App.--Austin 1947, writ dismissed n.r.e.) the court held that a change in permitted use was subject to continued scrutiny by the Board to assure that the transfer was in the public interest. One noted water law scholar suggests that the Briscoe standard has been embraced by the Commission. See Skillern, *Texas Water Law, Vol. 1.*, p. 74.

²⁵⁴ See Tex. Water Code §§ 5.102(a), 11.1271 & 11.1351.

²⁵⁵ 31 Tex. Admin. Code § 295.158 (b).

market transfers. These factors must be considered in developing a transfer system based on marketing principles. In addition to the administrative complexity and transaction cost issues associated with transfers, the "no-injury rule" and "interwatershed transfer rule" represent restrictions to water marketing.

3. NO-INJURY RULE

Although no Texas case has expressly adopted the no-injury rule,²⁵⁶ the Water Code provides that an applicant may not be granted a permit if it would impair existing water rights.²⁵⁷ The Commission follows the no-injury rule in approving new permits and transfer amendments to existing permits.²⁵⁸

Before the Commission can approve a transfer amendment, it must find that the change not only does not interfere with existing uses but that sufficient streamflow is maintained to protect existing uses.²⁵⁹ If the rule is invoked, the Commission must also comply with public notice and hearing requirements.

Rather than seeking to circumvent the rule through exceptions, the Commission should experiment with ways to minimize the rule. For example, California allows for "trial transfer" in situations where substantial injuries are unlikely but effects are difficult to predict.²⁶⁰ Another way to mitigate the rule's negative effect is to require that junior appropriators prove and accept monetary damages if injury results. Mitigation measures may be designed to overcome the harsh results of the rule.

Presumptions provide another means of reducing costs and delays from the speculative impacts of the rule. For example, a presumption regarding return flows

256 Skillern, Texas Water Law, (1993), p. 74.

257 Tex. Water Code § 11.134.

258 *Id.* See also 31 Tex. Admin Code 295.158(c).

259 *Id.* §11.1351.

260 Cal. Water Code §1735-1739.

from irrigation eliminates the need to ascertain return flows on a case-by-case basis. If the presumption represents reasonable approximations for particular areas and crops, attempts to rebut the presumptions would be infrequent.

Another way to reduce the application of the rule is to limit the amount of water to that amount that is consumptively or beneficially used.²⁶¹ This practice internalizes most third-party effects, thereby eliminating the need for complex transfer appeals and squabbles over return flows. The downside of this approach is the expense and effort needed to document historical consumptive use patterns.

Finally, it is important to note that it is not necessary to have all water subject to easy transfer to meet new demands. Flexibility can be provided if only a portion of water in a given river is subject to easy reallocation.

4. PUBLIC INTEREST REVIEW

A public interest review is required for new projects²⁶² and by implication a similar review is in order for water transfers.²⁶³ The Commission's rules seem to embrace the "public welfare" review standard for water transfers by requiring that they be prepared in the manner of an original application for a permit.²⁶⁴ "Public welfare" is not defined in the Code, leaving the Commission to rely on other regulatory laws for guidance in the approval of transfers.²⁶⁵

²⁶¹ Several commentators have suggested this approach. See Burness & Quirk, *Water Law, Water Transfers and Economic Efficiency: The Colorado River*, 23 *Law & Economics* 111 (1980); Johnson, Gisser & Werner, *The Definition of a Surface Water Right and Transferability*, 34 *Journal of Law & Economics* 273 (1981).

²⁶² See Tex. Water Code §11.134; 31 Tex. Admin Code §261.21.

²⁶³ See *Clark v. Briscoe Irrigation District*, 200 S.W.2d 674, 682 (Tex. Civ. App-1947), where the court held that water transfers are subject to Board (now Commission) approval to assure that they are in the public welfare.

²⁶⁴ 31 Tex. Admin. Code §295.71

²⁶⁵ While the Commission can draw on the EIS process for assessing social, economic and environmental impacts the law provides little guidance in suggesting how the Commission is to weigh and balance public interest considerations.

It is not clear if the Commission will embrace the environmental, social and economic impact statement requirements in water transfer cases.²⁶⁶ The environmental impact statement requirement is an umbrella process that insures public interests are weighed in proposed projects. As provided by the Commission's rules²⁶⁷, the statement must describe the potential environmental, social and economic changes likely to result from the proposal. The use of this process would insure that third-party effects are measured in transfer cases.

5. INTERBASIN TRANSFER RESTRICTIONS

The common element in all area of origin statutes is that a highly developed and water-poor area seeks a supply from a less developed and more water-abundant area. From a public policy perspective, the area of origin restrictions raise these fundamental questions: Should water remain where it is, to be treated as an asset of a geopolitical area to protect *in situ* natural and cultural values? Or is it an asset of some larger geopolitical community, to go where it is needed the most? How should "need" be characterized in such controversies? Should "need" be determined by an administrative system or a market based economic system? The Texas area-of-origin restrictions beg these questions.

Texas has adopted the restrictive approach (only surplus water may be transferred) when considering the interbasin transfers of water. This is reflected not only in its state planning and funding process but in the evaluation and granting of appropriative water rights permits.

A. Planning and Funding

Under a statutory provision that was repealed in 1991, the Texas Water Development Board was barred from planning any interbasin transfer of water required to supply the reasonably foreseeable needs for the next fifty years within the

²⁶⁶ See Schwartz, New Water Projects in Overappropriated Basins: Transfer of Water Rights in Texas, Austin: Proceedings of Water Law Conference, (Oct., 1985).

²⁶⁷ See 31 Tex. Admin. Code § 261.41 and §295.9.

basin of origin.²⁶⁸ While the planning restriction on interbasin transfers may have been lifted, a constitutional restriction on funding remains. The Water Development Board is constitutionally prohibited from funding any project "*which contemplates or results in the removal from the basin of origin any surface water required to supply the reasonably foreseeable future requirements for the next ensuing fifty-year period within the river basin of origin, except on a temporary or interim basis.*"²⁶⁹ In effect, this constitutional provision reserves water in the originating basin for a fifty year period to protect against a state funded water diversion project.

B. Permitting of Water Rights

Texas has acknowledged that when water is removed from its natural watershed a variety of economic, social, cultural and environmental impacts are possible and has adopted a statutory restriction that is intended to keep water in the basin of origin. The Commission is prohibited from issuing a permit to divert waters from one basin to another "*to the prejudice of any person or property situated within the watershed from which the water is proposed to be taken or diverted.*"²⁷⁰

Two significant questions arise regarding this rule. What types of transfers constitute "prejudice"? What is a watershed?²⁷¹ With respect to the former, the Texas Supreme Court has held that something more than mere inconvenience or minor injury is needed to invoke the "prejudice" rule.²⁷² "Prejudice" requires

²⁶⁸ Act of June 15, 1991, ch 297, § 3.

²⁶⁹ See Tex. Const. Art III, § 49-d.

²⁷⁰ Tex. Water Code § 11.085

²⁷¹ Skillern, Texas Water Law, Vol 1, (1993), p 76-77.

²⁷² See *Halsell v. Texas Water Commission*, 380 S.W.2d 1 (Tex. Civ. App.--Austin 1964, writ ref'd n.r.e.) and *City of San Antonio v. Texas Water Commission*, 407 S.W.2d 752 (Tex. 1966).

injury to existing rights at the time of transfer and may extend to the protection of future development for the area of origin.²⁷³ As to the question of what is a watershed, the Commission rules do not extend this restriction to every watershed but to only major, named river basins.²⁷⁴ Currently, the Texas Water Plan recognizes fifteen river basins. Thus many transfers from small watersheds within one of these fifteen river basins may be allowable without invoking the "no prejudice" rule.²⁷⁵

C. Notice of Interbasin Transfers

Commission rules provide for notice to be given to third-parties and the opportunity given to protest certain types of water permit applications.²⁷⁶ (See Chapter I for a discussion of the different types of permits). The Commission rules however do not explicitly provide for notification of third-parties that may be affected by interbasin transfers. This oversight may make it difficult for parties that may be affected by the transfer to have any meaningful input into the process.

6. RIGHTS TO CONSERVED WATER

Other than requiring applicants for a water permit to prepare a conservation plan, Texas law does little to encourage the voluntary conservation ²⁷⁷ of water. The Commission only requires applicants for new permits and for water transfers to submit a water conservation plan evaluating conservation as an alternative to the proposed appropriation or transfer. If the application is granted the Commission

²⁷³ *Id.*

²⁷⁴ 31 Tex. Admin Code § 297.18.

²⁷⁵ *But see* Halsell v. Texas Water Commission, 380 S.W.2d 1, 5-6 (1964) where the court disagreed with the Commission findings on no interbasin transfer.

²⁷⁶ *See* 30 Tex. Admin. Code §295.

²⁷⁷ Tex. Water Code §11.002 (8) (B). Conservation is defined, in part, to mean "those practices, techniques, and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative purposes."

may impose conditions requiring that the water rights holder implement conservation measures.²⁷⁸

One way to encourage conservation is to allow the conservor to use or sell the water saved. The rights of a Texas appropriator to recapture and market water saved through conservation practices are not easily resolved under statutory or case law. Judicial resolution of this question may turn on the "developed vs. salvaged water" test.²⁷⁹ Developed waters are generally those waters added from another source that increase the supply of a watercourse. Included are waters brought in from another basin or from other sources such as groundwater. Generally, developed waters belong to the importer or developer. Salvaged waters are defined as those lost to other users by a diversion from a watercourse but which become available for use by artificial means.²⁸⁰ Colorado courts have held that these waters do not belong to the appropriator/conservor but to the stream and the state as unappropriated waters.

While no Texas case can be found on this exact issue, Texas appears to follow the approach that developed waters belong to the developer.²⁸¹ Statutory clarification of the ownership rights to conserved water could encourage additional conservation efforts. Commission rules providing that the "amount of water appropriated which is conserved as a result of the implementation of water conservation measures shall not be subject to cancellation or forfeiture" is a

²⁷⁸ See Tex. Admin Code, Chapters 295, 297, & 288.

²⁷⁹ For the major cases on this paradigm see *Southeastern Colorado Water Conservancy District v. Sheldon Farms, Inc.* 529 P.2d 1321 (Colo. 1974) and *Giffen v. Colorado*, 690 P.2d 1244 (Colo. 1984).

²⁸⁰ See Skillern, *Texas Water Law, Vol. 1*, (1993), p. 79.

²⁸¹ See *Harrell v. Vahlsing, Inc.* 248 S.W.2d 762 (Tex. Civ. App.--San Antonio 1952, writ ref'd n.r.e.); *Guelker v. Hidalgo County WCID No. 6*, 269 S.W.2d 551 (Tex. Civ. App.--San Antonio 1954, writ ref'd n.r.e.); and *Scoggins v. Cameron County WID No. 15*, 264 S.W.2d 169 (Tex. Civ. App.--Austin, writ ref'd n.r.e.).

laudable change in policy.²⁸² However, this policy is subject to challenge on the basis that it is not statutorily authorized, or is beyond the scope of Commission jurisdiction.

7. PUBLIC TRUST DOCTRINE AND WATER TRANSFERS

Narrowly defined laws and fragmentation in legislation and administrative action may force those seeking judicial support for water reallocation to protect environmental values to resort to the public trust doctrine. Texas surface waters are public resources²⁸³ which are be subject to the public trust doctrine. While the scope of the doctrine is poorly defined in Texas, there is little doubt that it exists.²⁸⁴ The doctrine has been used to prevent title to submerged lands from being conveyed to private persons without the consent of the legislature²⁸⁵ and to uphold public access to and recreational use of navigable waters.²⁸⁶

The Mono Lake case in California²⁸⁷ closely parallels many aspects of estuary inflows and minimum stream flows in Texas. There are many statutory similarities between the California and Texas water codes that lend credence to adoption of the

²⁸² 31 Tex. Admin. Code §297.56.

²⁸³ Tex. Water Code §11.021. [The Water Code declares that the water in rivers, in streams and lakes, and in bays or arms of the Gulf of Mexico is property of the state].

²⁸⁴ See Kaiser & Kelley, Water Rights for Texas Estuaries, 18, *Texas Tech Law Review* 1121, 1146-1152, (1987); Weaver, The Public Trust Doctrine and Texas Water Rights Administration: Common Law Protection for Texas' Bays and Estuaries? 15 *State Bar of Texas Environmental Law Journal* 1 (1985).

²⁸⁵ See *Butler v. Sadler*, 399 S.W.2d 411 (1966).

²⁸⁶ In *Diversion Lake Club v. Heath*, 86 S.W.2d 441 (1935), the court ruled that the waters of a lake formed by damming a navigable stream were owned by the state in trust for the benefit of all the people, and were subject to use by the public for navigation, fishing and other lawful purposes. This ruling supports the thesis that vested water rights are held in trust for the public and they may be reallocated to protect environmental values.

²⁸⁷ *National Audubon Society v. Superior Court*, 658 P.2d 709 (1983).

doctrine as a tool for reallocating Texas water to protect environmental values.²⁸⁸

8. TEXAS GROUNDWATER LAW AND WATER MARKETING

Up to this point, the analysis of Texas water law and marketing has been limited to surface water²⁸⁹ and has not included groundwater. As described in Chapter 1, Texas follows a different allocational rule for groundwater. Instead of declaring groundwater to be state water subject to appropriation, Texas has unequivocally followed the "English" or "common law" rule that allows the landowner to claim, take for use or sale, all the water that can be captured from beneath the surface of his/her land. Under this rule, there is no landowner incentive to conserve or manage water to sustain long term growth nor is it possible to manage groundwater on an aquifer-wide basis. Since the rule discourages aquifer management to sustain long term growth it presents an allocational paradox, especially when considering the widespread recognition of the interrelationship of surface and groundwater and the need to conjunctively manage surface and groundwater to meet domestic, municipal, agricultural and environmental requirements in certain areas of the state.

A. Groundwater Defined

As a prelude to discussing Texas groundwater law and marketing it is important to understand the term "groundwater," and the legal presumptions ascribed to it. Groundwater, or percolating waters, are those waters below the surface of the ground not flowing through the soil in known and defined channels but are waters oozing or filtering through the earth.²⁹⁰ Percolating waters are legally distinguishable from subterranean rivers or streams flowing in well defined beds

²⁸⁸ See Kaiser & Kelley, *Water Rights for Texas Estuaries*, pp. 1149-1152.

²⁸⁹ Surface water as defined in the Water Code includes the ordinary flow, underflow and tides of every flowing natural watercourse in the state. Tex. Water Code § 11.021.

²⁹⁰ *Houston & T.C.R.R. v. East*, 81 S.W. 279 (1904).

and channels²⁹¹ and from the underflow of rivers and streams.²⁹² While a number of commentators have suggested that surface water rules will apply to these waters, it should be noted that the Texas Supreme Court has not yet squarely declared whether surface water rules will apply to subterranean streams. The Texas Legislature has added to this uncertainty by specifically excluding from the definition of groundwater the water in subterranean streams. It has not indicated whether surface water rules may apply to subterranean streams.²⁹³

In the absence of clear evidence to the contrary, there exists a legal presumption that all groundwater is percolating water as opposed to water in subterranean streams.²⁹⁴ Consequently, the surface owner is presumed to own percolating groundwater, until it is rebutted by a showing that the water being pumped is from a subterranean stream or from stream underflow. This requires that the party, asserting that surface water rules should apply to groundwater pumping, must hydrologically establish that percolating waters are from an underground river or are from the underflow of a surface stream.²⁹⁵ This is a burden of proof that is very difficult to meet.

B. Texas Groundwater Law

From a legal perspective, Texas groundwater law is relatively simple and straightforward. Texas follows the absolute ownership theory with respect to rights

²⁹¹ Three Texas courts have indicated in dicta that surface water rules may apply to water flowing in underground rivers. See *Cantwell v. Zinser*, 208 S.W.2d 577 (Tex. Civ. App.--Austin 1948, no writ); *Texas Co. v. Burkett*, 296 S.W. 273 (1927) and *Houston & T.C.R.R. v. East*, 81 S.W. 279 (1904). In 1992, the Texas Water Commission declared the Edwards Aquifer to be an underground river and sought (unsuccessfully) to regulate these waters as state waters.

²⁹² Tex. Water Code § 11.021.

²⁹³ Tex. Water Code § 52.001.

²⁹⁴ See *Texas Co. v. Burkett*, 296 S.W. 273 (1926) and *Denis v. Kickapoo Land Co.*, 771 S.W.2d 235 (Tex. Civ. App.--Austin, 1989, no writ history).

²⁹⁵ Skillern, F. Texas Water Law--Vol. 1, (1993), pp. 182-183.

to capture and use groundwater. A landowner has a absolute legal right to capture all of the water which he can from beneath his property. The often unappreciated side effect of capture is that current well owners are not protected from excessive pumping by other landowners.²⁹⁶ In essence, groundwater is a common resource that is subject to a "tragedy of the commons" scenario.²⁹⁷

Once groundwater has been captured it can be used or sold by the landowner.²⁹⁸ Because the Texas Water Code confirms private property rights in percolating water,²⁹⁹ the restrictions of Code applicable to state water do not apply to groundwater.³⁰⁰ This means that groundwater use is not limited to use on the overlying land, nor is it limited to use in the overlying aquifer.³⁰¹ Restrictions on the sale of water by underground water conservation districts have been removed

²⁹⁶ While Texas groundwater law is characterized as an absolute right for the landowner, this is somewhat of a misnomer. A landowner does not have an absolute right to the water beneath his/her land but only has an absolute right to capture it. The results of this rule can be illustrated with the following example. Suppose landowner A's property overlies the source of percolating groundwater that would normally flow under landowner B's property. Under the absolute ownership rule landowner A can capture all of the percolating groundwater under his/her property thereby depriving landowner B of any water and B is without any legal remedy. See *Pecos County Water Control and Improvement Dist. No. 1 v. Williams*, 271 S.W.2d 503 (1954); *Denis v. Kickapoo Land Co.*, 771 S.W.2d 235 (1989).

²⁹⁷ For the seminal article on this point see Hardin, G., *The Tragedy of the Commons*, 162 *Science* 1243-48 (1968).

²⁹⁸ *Texas Co. v. Burkett*, 296 S.W.273 (1926).

²⁹⁹ *Tex. Water Code* §§ 52.001 and 52.002.

³⁰⁰ The Texas Water Code is the sole source of statutory regulations of groundwater production. See *City of Sherman v. Public Utility Com'n*, 643 S.W.2d 681 (1983).

³⁰¹ The interwatershed transfer restrictions of the Code apply only to state waters and not to private waters. *Tex. Water Code* §11.085. Groundwater extracted from subterranean streams and from the underflow of natural streams would be state water and therefore subject to Code. For a case involving transferring groundwater outside the aquifer see *City of Pleasanton v. City of Corpus Christi*, 276 S.W.2d 798 (1955).

and districts may now buy and sell water.³⁰²

C. Marketing Groundwater

Groundwater can be freely purchased and sold by private parties and public agencies.³⁰³ The legal and hydrological barriers to marketing groundwater do not constrain the seller as much as they do the purchaser. The absolute ownership 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. As a practical matter, aquifer capacity can be determined and projections made on the amount of water that can be extracted. These projections are contingent on non-interference by adjoining landowners.

In theory, any landowner, with legal impunity, may capture all the water and deprive another landowner of water.³⁰⁴ As such the Texas capture rule does not provide certainty or predictability for the purchaser of water as the amount of water that can be captured and marketed is highly variable over time³⁰⁵. A seller of groundwater can only convey to the buyer that amount of water that can be captured. As such, Texas groundwater law lacks the elements of *exclusivity* and *enforceability*--two elements described in the economic literature as necessary for water marketing.³⁰⁶ 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.

³⁰² Tex. Water Code §52.156.

³⁰³ *Id.*

³⁰⁴ Exceptions to the rule are for malicious pumping and subsidence.

³⁰⁵ This presents a serious projection problem for water purchasers that need to develop capital development amortization schedules based on numerically measurable amounts of water.

³⁰⁶ See discussion in Chapter II, Section 1.

The absolute ownership, or capture rule works very well when water is not scarce and when water users do not affect each other to justify the cost of defining and enforcing property rights in water. When water becomes scarce, the capture rule does not encourage limiting water use to available supply (sustainability of the aquifer and existing uses) nor does it allocate water to the highest value uses.³⁰⁷ In order to efficiently and equitably market groundwater, Texas groundwater law must be changed to allow for the transferability of adjudicated groundwater rights. Water markets can be initiated by adapting the Texas surface water, or the Edwards Aquifer allocational system to the other aquifers in Texas.

9. TEXAS WATER DISTRICTS AND WATER MARKETING

Water districts in Texas will play an important role in marketing. Historically, water districts have played an important part in developing water resources and because of this role and their unique legal authority they will be crucial to developing any marketing strategy.³⁰⁸

Water districts in Texas are highly varied in purpose, authority and structure. They include districts for water supply, sewer systems, drainage, irrigation, navigation, subsidence, flood control, underground water conservation, utility, and river management. The number of districts in Texas has been estimated at between

³⁰⁷ Collinge, R. *et al.* The Edwards Aquifer: An Economic Perspective, Texas Water Resources Institute, Report # TR-159 (March 1993).

³⁰⁸ A number of studies have examined the role of special districts in developing and managing the state's water resources. See Clay, The Lower Colorado River Authority: A Study in Politics and Public Administration, Unpublished Ph.D. dissertation, Austin, University of Texas (1948); Harper and Griffin, Regional Management of Water Resources: River Authorities in Texas, College Station: Texas Agricultural Experiment Station Report #MP-1666 (1988); Thrombley, Special Districts and Authorities in Texas, Austin: University of Texas, Institute of Public Affairs, Public Affairs Series #39 (1959); Water District and River Authority Study Committee, Report to the 70th Legislature--Vol 1, Austin, (1986); and Williams, The Story of the Lower Colorado River Authority: A 50th Anniversary Retrospective, 1984 Annual Report, Austin: Lower Colorado River Authority.

1000 to 4000, but the number of active districts is unknown.³⁰⁹

A. Legal Basis for Districts.

Article XVI, § 59 of the Texas Constitution is the principal authority for the creation of water districts. This provision, commonly titled the Conservation Amendment, declares that the conservation and development of water resources is an important state objective and it authorizes the legislature to create districts to carry out this objective.³¹⁰ Based on this constitutional authority, the Texas legislature has created general law, special law and river basin districts. A number of districts have been created under each approach.

General law districts are created pursuant to Chapter 50 of the Texas Water Code and include standardized procedures for elections, administration, powers and duties, reporting and financial affairs.³¹¹ These types of districts can be created anywhere in the state and are controlled by the basic enabling act. Examples include water control and improvement districts (WCID's), municipal utility districts (MUD's), underground water conservation districts, drainage districts and irrigation districts.

Special law districts are created by a state statute that applies only to that district. These types of districts are governed by the particular enabling or organic act establishing the district and general law provisions that are in conflict with the organic act usually do not apply. It is not always clear whether a district is a special

³⁰⁹ See Harper and Griffin, Regional Management of Water Resources: River Authorities in Texas, College Station: Texas Agricultural Experiment Station Report #MP-1666 (1988) and Kaiser, Handbook of Texas Water Law, College Station: Department of Water Resources (1987).

³¹⁰ The Conservation Amendment removed an earlier debt limitation (Article III, § 52 of 1904) imposed on districts. Thus special districts are not subject to the tax and debt limitations imposed on the state, counties or cities.

³¹¹ Skillern, Texas Water Law--Vol II, Sterling Press: San Antonio, (1991), pp. 196-198.

law or general law district and a district's name is not always controlling.³¹²

B. River Authorities.

River authorities are like snowflakes--no two are alike. They are exclusive creations of the Texas legislature and are classic examples of special law districts. As political subdivisions of the state, river authorities operate as governmental agencies and are subject to some state laws.³¹³ However, their authority and structure is governed by their own enabling act.

River authorities represent a regional approach to management and control of water resources that had its roots in the regionalism concepts of the 1930's. The Tennessee Valley Authority (TVA) is the classic example of the regional watershed approach for the management of natural resources and while the creation of the Brazos River Authority (1929) predates the TVA (1933), this model guided the Texas legislature in the creation of other river authorities. As such, Texas river authority boundaries generally conform to watersheds and often ignore geopolitical lines.

1. *Defining River Authorities.* As originally envisioned, river authorities were created for the purpose of managing the waters of major river basins. The term "river authority" implies a political entity that has jurisdiction over an entire river with broad powers and duties to manage the water resources of the river. The Texas legislature has deviated from the basin-wide concept in the

³¹² *Id.* p. 202. Some water control and improvement districts and municipal utility districts may be subject to specific legislation if they were created by a special act of the legislature. This becomes a complicating factor in determining the authority for WCID's and MUD's.

³¹³ For example, river authorities are subject to the liability provisions of the Texas Tort Claims Act [Tex Civil Practice and Remedies Code §§ 101.001 to 101.009] and under the Development Corporation Act of 1979 [Tex. Rev. Civ. Stat. Ann. art. 8280-101] may issue industrial development bonds.

creation of river authorities³¹⁴ and has even combined rivers into a single authority. In fact, not everyone agrees on the number of river authorities.³¹⁵ Some authors have suggested that "river authority" attached to an organization's name does not qualify it as a river authority nor does the lack of that designation preclude an organization from functioning like an authority.³¹⁶ Harper and Griffin suggest that river authorities should be determined by boundaries that are regional in character and by broad based powers and duties embodying total watershed management.³¹⁷ They identified 13 river authorities in Texas that met these criteria. This analysis incorporates their designation (See Table 4-2).

2. Purpose, Powers & Duties. Each river authority is created by a special enabling act and has a unique set of powers and duties as determined and outlined by the legislature. Although not all river authorities share the same set of powers, most have the authority for storage and conservation of water, flood control, soil conservation, reforestation and river restoration, water supply, hydroelectric power, navigation, pollution control, recreational development and for the acquisition and sale of water and water rights.³¹⁸ This last power is the most relevant for water marketing in Texas.

³¹⁴ For example, only the Brazos River Authority, Sabine River Authority and Red River Authority have jurisdiction over the entire basin. See Harper & Griffin, Regional Management of Water Resources, (1988).

³¹⁵ Skillern, Texas Water Law--Vol II, (1991), p. 242 lists 17 river authorities and Harper and Griffin, Regional Management of Water Resources, (1988), p. 6 lists 13 river authorities.

³¹⁶ See Harper & Griffin, Regional Management of Water Resources, pp. 4-6 citing a number of sources in defining river authorities.

³¹⁷ *Id.*

³¹⁸ For a specific enumeration of the powers for each river authority reference must be made to the enabling act(s) for the authority. Both Skillern, Texas Water Law--Vol II, (1991) and Harper and Griffin, Regional Management of Water Resources (1988) contain more detailed discussions of the powers of each authority.

3. *Water Rights Held by River Authorities.* River authorities are major water brokers and suppliers of water.³¹⁹ Like any other water rights holder, river authorities must get a permit before making any diversions or impounding water and they are entitled to water according to their priority date. Authorities may also acquire and sell water rights. In fact, 30 percent of the acre-feet of water permits held by river authorities was acquired by negotiated purchase.³²⁰ All of the river authorities hold water rights permits except the Nueces River Authority, the San Antonio River Authority and the Sulphur River Basin Authority.³²¹

Harper and Griffin suggest that since 1970, river authorities have supplied between 30 and 50 percent of total surface water use and 25 percent of the consumptive surface water use in the state.³²² Data furnished by the Texas Water Development Board (Table 4-2) suggest that this amount is closer to 20 percent. River authorities are not direct users of this water, but sell it to customers. It must be noted that only the right to use the water is sold and not the underlying water rights permit.³²³

³¹⁹ Water rights figures compiled by the Texas Water Development Board, Water Supplies Section using data from the Texas Natural Resource Conservation Commission indicate that there are 11,120 owners of active water rights in Texas. Of these 11,120 owners of water rights permits, 170 holders control 95 percent of the authorized non-hydroelectric diversions of state water. About 1 percent of the water rights holders control 95 percent of the state's surface water rights.

The nine river authorities examined in this study (see Table 4-2) hold water rights to more than 6 million acre feet of water supplying about 20 percent of the consumptively used surface water in the state.

³²⁰ Harper and Griffin, Regional Management of Water Resources, (1988), p. 29.

³²¹ *Id.*

³²² *Id.* p. 15.

³²³ The Brazos River Authority has over 100,000 acre feet of water available for sale to potential purchasers. Interview with Mike Field, General Counsel for the Brazos River Authority.

TABLE 4-2. WATER SUPPLY MANAGEMENT BY TEXAS RIVER AUTHORITIES

River Authority	Acre-Feet of Conservation Storage in Basin	Acre-Feet Diversion/yr (Non-hydro)	Percent of State Total (Non-hydro)	Cumulative Percent of State Total
Angelina-Neches River Authority	1	85,507	.26%	.26%
Brazos River Authority	2,753,000	737,568	2.23%	2.49%
Guadalupe-Blanco River Authority	443,610	227,701	.70%	3.19%
Lower Colorado River Authority	2,382,690	1,963,495	5.95%	9.14%
Lower Neches Valley Authority	2,970,500	1,201,876	3.64%	12.78%
Nueces River Authority	690,400	3		
Red River Authority	2,829,000	14,080	.01%	12.79%
Sabine River Authority	6,044,300	1,323,860	4.01%	16.80%
San Antonio River Authority	2	3	---	
San Jacinto River Authority	570,400	155,000	.47%	17.27%
Sulphur River Basin Authority	1	3	---	
Trinity River Authority	2,099,380	449,200	1.36%	18.63%
Upper Colorado River Authority	119,200	80,650	.25%	18.88%

1 The Angelina-Neches and Sulphur River Basin Authority do not have developed reservoirs

2 Only has power plant cooling reservoirs

3 Holds no water rights permits

CHAPTER FOUR SUMMARY

Surface water in the state of Texas is owned by the people and held in trust by the state. An appropriator holds a permit to use and enjoy the water, but not a title to the water. A permit extends certain rights and restrictions regarding the use of the water to the appropriator. In order to obtain a permit, the individual must show that there is a source of unappropriated water available, that the water will be put to a beneficial use, and that the use of this water will not impair existing water rights. Additionally, the Commission must assess public welfare considerations such as the effects on wildlife, water quality and instream uses. Applicants must also demonstrate that reasonable conservation practices will be utilized.

Water rights, since they are a vested property right, may also be acquired by means of a transfer through a change in ownership, point of diversion, place of use, time of use, or basin of use. These transfers require approval by the Commission through an application process similar to the one used for an original permit. Several considerations exist that might serve to impair the ease of water rights transfers. These are the no-injury rule, the public interest review requirement, area of origin basin restrictions, and public trust issues. A final consideration is whether or not an individual who conserves water has the right to that water. If the conservor did retain the water rights, not only would a water source be available for other uses, but the incentive to conserve would also be created.

V. CONCLUSIONS & RECOMMENDATIONS

Water has played a crucial historical role in the economic development of Texas; in the future water will continue to be the major determining influence. Economic and population growth in urban areas has increased the demand for water. While new demands are placed on Texas' water resources, the amount of water used in irrigated agriculture is declining. Concomitant with these demands are new calls for water to protect the ecological integrity of estuaries, to provide for minimum instream flows to protect environmental amenities of rivers, to protect endangered resources and to provide for recreational opportunities.

Physical, fiscal and environmental constraints on the development of new surface water reservoirs make this water management option less economically desirable than reallocating water to new uses, reusing and recycling existing water and water conservation. Transferring water from lower to higher valued uses is a form of conservation in that conservation is expanded from a definition of reducing the amount of water used to one which includes concepts of economic efficiency.

Market-based transfers of water are the single most significant tool available for responding to changing water needs. A market-based approach encourages reallocation through transfers between willing buyers and sellers with the Texas Natural Resource Conservation Commission overseeing the process to protect the public interest. It may avoid the necessity of canceling unused water rights. The 1992 Texas Water Plan recognizes that in an era of increasing water scarcity and more stringent environmental regulations, water reallocation, reuse and recycling and conservation are water management options to meet future water needs. If successful, these approaches may make it possible for the State to avoid constructing more expensive and environmentally destructive reservoirs.

To meet the challenges in the new era of reallocation and conservation, eleven conclusions and recommendations are offered to remove the barriers to transfers. They are also intended to improve efficiency while balancing the demands for equity between regions of the state and insuring protection of the public interest.

CONCLUSION 1: TEXAS HAS A HISTORY OF VOLUNTARY WATER TRANSFERS IN SELECTED AREAS OF THE STATE.

While the legal authority to transfer water rights extends back as far as the 1913 Irrigation Act and the 1917 Conservation Amendment, the conditions have not been right for water markets to develop. With passage of the Water Rights Adjudication Act and urban growth in south Texas, conditions were right for the development of the Lower Rio Grande Water Market.³²⁴ Two studies of water rights transfers confirm the existence of a limited market and conclude that water marketing is a viable means to reallocate water from lower to higher valued uses.³²⁵ The studies concluded that water markets were possible because:

- (1) The Rio Grande was fully appropriated and water rights were fully adjudicated.
- (2) No alternative groundwater supplies were available.
- (3) There was no seniority among users.
- (4) There were enough buyers and sellers to avoid a monopoly.
- (5) Water diversion and uses are closely monitored.
- (6) Return flow problems were nonexistent.
- (7) Substantial urban growth generated the demand for higher valued uses for water.

Readers should be cautioned against inferring from these results that water markets are feasible in every region of the state.³²⁶ The Lower Rio Grande Valley is

³²⁴ By rule the Lower Rio Grande Valley is defined as that area downstream of Falcon Dam. See 31 Tex. Admin Code § 303.

³²⁵ Schoolmaster, A., Water Marketing and Water Rights Transfers in the Lower Rio Grande Valley, Texas, 43 *Professional Geographer*, 292 (1991); Chang, C., & Griffin, R., Water Marketing as a Reallocative Institution in Texas, 28 *Water Resources Research* 879 (1992).

³²⁶ Over the last 5 years only 6 transfers of a water right have occurred in Texas outside the lower Rio Grande Valley. This figure only includes those transfers of a state water right permit involving a change in purpose or place of diversion. It does not include those transfers associated with the sale of land. Miller, E., Water Marketing in Texas: Myth or Reality, College Station: Texas A&M University, Department of Recreation, Park and Tourism Sciences, unpublished Master's paper, 1994.

controlled by a unique set of legal rules,³²⁷ water conditions and population growth patterns that may not be replicable in other parts of the state. To identify realistic opportunities for using marketing approaches in more general settings it is essential to understand third-party impacts and other legal nuances.³²⁸

CONCLUSION 2: WATER TRANSFERS CAN PROMOTE THE EFFICIENT ALLOCATION OF WATER IF THERE IS A NEXUS BETWEEN LEGAL, INSTITUTIONAL, ECONOMIC, CONVEYANCE, POPULATION GROWTH AND DROUGHT FACTORS.

While it is indisputable that a market-based transfer program requires scarcity and increasing demand for water, a successful program also requires the presence of other conditions. The marketing literature and experiences in other states suggest that a number of conditions are necessary for the development of market-based water transfers. While not existing simultaneously, these elements are necessary for a successful water market:

- (1) Legally defined and transferrable private property rights in water.
- (2) A critical mass of buyers and sellers so that no one person or party can dominate and control the market.
- (3) A market information system and data base to enable buyers and sellers to ascertain water availability, price, transaction costs and transfer procedures.
- (4) An efficient conveyance system to move the water from the sellers to the buyers at a low cost.
- (5) A demand for higher valued water (usually the result of urban growth or new environmental needs for water).
- (6) Water currently allocated to lower valued uses (usually irrigated agriculture).
- (7) Scarcity (usually expressed as fully appropriated surface waters).
- (8) Limited availability of other supply sources (usually groundwater).

³²⁷ Commission rules outline conversion formulas for measuring the transfer of irrigation rights to municipal rights, limitations on buyers and sellers for contractual sales of water, and prohibitions on resale of water. *See* 31 Tex. Admin. Code §§303.41-303.55.

³²⁸ *See* Chang & Griffin, *Water Marketing as a Reallocative Institution in Texas*, (1992), p. 889.

All, or some, of these factors are present in successful water transfers in Texas and in other western states.

RECOMMENDATION:

- The Texas Water Development Board should investigate the presence of these factors within the 15 river basins in the state to determine the feasibility of intrabasin water markets.

CONCLUSION 3: TEXAS SURFACE WATER LAW PERMITS THE REALLOCATION OF WATER THROUGH MARKET-BASED 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 are transferrable.³²⁹ When water rights have these characteristics, users have the certainty, consistency and predictability provided by law to make long term investment decisions for the use of that water. If all values associated with the water are included in that bundle of rights, and market prices reflect all of the social costs associated with that use, a water transfer process will efficiently allocate that water to its highest and best social use.

Texas law recognizes that water rights are private property and are freely transferable to other public and private parties. Strictly speaking, the water belongs to the state but the right to use and enjoy it may held in private ownership. The Commission is required to protect the public and private interests that accrue from this water by reviewing all proposed transfers.

The level of administrative complexity in the approval process depends on the nature of the transfer. If the transfer will not result in a greater consumptive use nor pose harm to other water right holders, no public hearing is required and the transfer may be approved with minimal cost. On the other hand, those transfers

³²⁹ See generally, Colby & Bush, Water Markets in Theory and Practice, Boulder: Westview Press (1987) and Tietenberg, T., Environmental and Natural Resource Economics (3rd), New York: Harper & Collins (1992).

that may negatively affect other water right holders, or that involve a substantial change in the place of use, purpose of use, and time of use require greater Commission review. This review requires that the Commission give public notice of the change and hold a public hearing before approving or denying the transfer request.

CONCLUSION 4: PUBLIC INTEREST CRITERIA ARE NEEDED TO PROTECT AGAINST NEGATIVE THIRD-PARTY, SOCIAL, CULTURAL AND ENVIRONMENTAL EFFECTS IN INTRABASIN AND INTERBASIN TRANSFERS

Regulatory process and public interest considerations should encompass third-party issues, existing water rights holders, environmental and recreational water needs, and social and cultural values in water transfers. Most water marketing studies recognize the various impacts of water transfers and acknowledge that the negative impacts can be avoided or mitigated through the planning or regulatory process. The nature of the impacts and the parties affected are extremely variable. In developing transfer laws, balances must be sought between the public and private gains from transfers and the need to protect the public interest.

As a general rule, transfer processes and requirements that protect against all third party impacts, regardless of their nature and magnitude, result in higher transaction costs and discourage desirable transfers. Processes and criteria should distinguish between large and pervasive effects and smaller ephemeral impacts.

Texas law does not account for all these values in water transfer cases. The Commission is only required to assess the environmental impacts of water transfers on existing instream uses, water quality, aquatic, riparian and wildlife habitat, and fresh water inflow needs for bays and estuaries.³³⁰ Any transfer that has the potential to adversely impact these environmental values is evaluated and limitations and conditions may be imposed on a transfer permit. An

³³⁰ See Tex. Water Code §§ 11.147, 11.150, 11.153.

Environmental Impact Statement (EIS) is only prepared and reviewed as part of the transfer process if the parties are required under federal law to file such a statement. In other cases, an EIS requirement or condition is left to the Commission's discretion.

The Water Code requires that "public welfare" considerations must be part of a new permit process and the Commission has extended the rule to the transfer approval process. The Code (§11.085) requires consideration of third-party effects from transfers but it does not provide a definition of what constitutes "public welfare."

RECOMMENDATIONS:

- The Legislature should:
 - (1) insure that broad based public interest values are considered in intrabasin and interbasin transfers by statutorily specifying the applicable criteria to be used in this review,
 - (2) direct the Commission to develop a planning and regulatory process capable of weighing these criteria in evaluating transfers and
 - (3) require that the Commission determine ways of mitigating significant adverse impacts.³³¹

³³¹ Alaska and Idaho have developed specific criteria for determining public interests. Alaska's appropriation law requires the commissioner to consider: (1) the benefit to the applicant resulting from the proposed appropriation, (2) the effect of the economic activity resulting from the proposed appropriation, (3) the effect on fish and game resources and on public recreational opportunities, (4) the effect on public health, (5) the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation, (6) harm to other persons resulting from the proposed appropriation, (7) the intent and ability of the applicant to complete the appropriation, and (8) the effect upon access to navigable or public water. [Alaska Stat. §46.15.080].

Idaho's experience in defining public interest for water transfers is based on both statutory and case law. The Director of the state water agency is required to approve a transfer provided the change in use is in the "local public interest." Local interest is defined as "the affairs of the people in the area directly affected by the proposed transfer." [Idaho code §42-203A(5)]. The Code prevents the Director from approving a change in the nature of use from agriculture use where such a change would significantly affect the agricultural base of the local area. [Idaho code §42-222].

In *Shokal v. Dunn*, 707 P.2d 441 (1985), the Idaho Supreme Court required the Director to determine if the following interests had been adequately considered in a transfer project: "fish and wildlife habitat, protection of aquatic life, recreation, aesthetic beauty, navigation, water quality, access to public waters, minimum stream flows, waste prevention and the promotion of

- The Legislature should authorize the Commission to encourage negotiated resolutions to third-party, environmental, recreational, social and cultural conflicts through a planning and regulatory process.
- Costs associated with mitigating public interest effects should be internalized as part of the transfer.³³²
- Transaction costs and third party impacts associated with transfers can be minimized by limiting the transferable quantity of water to the amount consumptively used during the last 5 years. The Commission should develop consumptive use tables for various categories of water uses that are flexible enough to account for variations in local conditions.

CONCLUSION 5: THE NO-INJURY RULE PROTECTS THE STATUS QUO AND IS AN OBSTACLE TO WATER TRANSFERS.

Water transfers involving a change in place, purpose or time of use or point of diversion are allowed under the Water Code and Commission rules, subject to the

conservation.” The Court went further in suggesting the differential manner in which the factors should be weighed: “The relative elements and their relative weights will vary with local needs, circumstances and interests. for example, in an area heavily dependent on recreation and tourism or specifically devoted to preservation in its natural state, the Department of Water Resources may give great consideration to the aesthetic and environmental ramifications of granting a permit which calls for substantive modification of the landscape or the stream.” [707 p.2d @450].

³³² The importance of the effects on persons who are not direct parties to the market transactions is related to the economic concept of externalities. In the literature of economics, an externality occurs when the action of an individual or a group of individuals has economic consequences which are not priced by the market. In terms of social and economic welfare, the existence of externalities reduces the optimizing tendencies of the market for allocating resources because there is no feedback of incentives, rewards or penalties to control the producer of the effect. Natural resource and environmental protection programs such as the federal Clean Air Act, Clean Water Act, Surface Mine Reclamation Act and a plethora of other regulatory programs seek to internalize the external effects of pollution into the price of the product. For an economic discourse on externalities see Krupp, S., *Analytic Economics and the Logic of External Effects*, *American Economic Review*, May 1963; and Mishan, E. *Welfare Economics*, Random House, 1964.

condition that the change not impair existing water uses.³³³ Transfers may not be granted if they will cause an injury. The Texas no injury rule raises three issues that must be addressed by the applicant and the Commission in the transfer process. These issues are; (1) establishing the type of injury suffered by other appropriators, (2) measuring the extent of injury and (3) determining who has the burden of proof. If the rule is interpreted as a zero tolerance standard, a *de minimis* injury will impede market based transfers. Clearly, the injury must substantially affect the vested rights of juniors to the use of water. Closely related to measuring the extent of the injury is the issue of burden of proof of injury. In Texas, the no injury rule places a heavy burden on the applicant to show absence of injury. This burden increases the transaction costs of transfers and makes uncertain the results until the transfer is completed.³³⁴

RECOMMENDATIONS:

The no injury rule as it is presently constituted represents a substantial obstacle to water transfers in Texas. Several options are available to the Commission and the Legislature to limit the harsh results of the rule. If the Commission is without legal authority to pursue any of these options, the Legislature should amend the Code to allow for these provisions.

- When it appears that the effect on junior appropriators from a transfer will be difficult to determine in advance of making the transfer, the Commission should authorize a conditional order allowing the transfer, subject to further proceedings to modify the approval so as to prevent such harm as might be proven in later proceedings. If it appears in later proceedings that the harm sustained by the protesting junior appropriator is slight compared to the value in use after the transfer, the Commission may deny specific relief.

³³³ Tex. Water Code § 11.134(b)(3)(B).

³³⁴ See Gould, Water Rights Transfers and Third-Party Effects, 23 *Land & Water L. Rev.* 1, 30 (1988).

- As an alternative to revoking the transfer, the Commission could deny relief and transfer the case to a court of appropriate jurisdiction for recovery of damages, including costs and reasonable attorney fees suffered by the junior appropriators.
- The least complex solution to the problem would be for the Commission to limit the amount of water transferred to that consumptively used during the previous 5 years. [This would eliminate the return flow problem but it might reduce the amount of water available for transfer].

CONCLUSION 6: THE TEXAS INTERBASIN TRANSFER RESTRICTION DOES NOT CONSTRAIN THE DEVELOPMENT OF INTRABASIN WATER MARKETS BUT IT IS ONE OBSTACLE IN THE DEVELOPMENT OF STATEWIDE WATER MARKETS.

As economic and environmental demands for water increase and available water supplies in areas of shortage shrink the number of proposals for interbasin transfers of water will increase. Interbasin transfer rules seek to provide safeguards for the areas exporting water and reflect political compromises and balances between these areas of a state. These safeguards may range from absolute prohibitions to accommodations for transfers. In states such as California that seek to accommodate transfers, provisions are made for recapturing this water when it is needed for development in the area of origin.

Texas has a long history of dealing with interbasin transfers and has sought to allow transfers only after reserving enough water in the basin of origin to insure that basin's future economic growth.³³⁵ The interbasin transfer provision prohibits the diversion of water from one basin to another if the transfer would result in "the prejudice of any person or property situated within the watershed from which the

³³⁵ Interbasin transfers have been constitutionally and statutorily addressed in the water permitting and planning process. Area of origin protections were addressed as far back as the 1913 Irrigation Act.

water is proposed to be taken or diverted.”³³⁶ On its face this seems to be a “zero tolerance standard” for harm giving one basin a veto power over transfers. However, the Texas Supreme Court has held that something other than minor injury must be shown to prevent the transfer.³³⁷ While the statute does not define a basin, specify the type or magnitude of injury that constitutes “prejudice,” or indicate the criteria that the Commission is to use in evaluating transfer requests, interbasin transfers are possible if existing rights are protected.

RECOMMENDATIONS:

If the current statute is deemed to present a major obstacle to future statewide water markets, any amendments should be evaluated in accordance with these economic and environmental criteria:

- A proposed transfer should be the least cost way of securing an additional supply of water.³³⁸
- Economic, social and environmental benefits generated by transfer in the receiving area should exceed the full cost of the transfer *plus* the net benefits which that same water could have generated in the basin of origin.
- Beneficiaries of the transfer should be obligated to repay with interest the full project costs allocated to the transfer from which they benefit.
- An increase in regional economic development attributable to a proposed interbasin transfer should not alone serve to justify the proposal. The transfer should result in state economic gains in benefitted areas which more than offset resulting net economic losses in other affected areas of the state.

³³⁶ Tex. Water Code §11.085.

³³⁷ City of San Antonio v. Texas Water Rights Commission, 407 S.W.2d 752, 758 (1966).

³³⁸ While there may be other options that are lower in cost but less reliable for providing a sufficient water supply for future needs, the least-cost principle should be the litmus test.

- All reasonably determinable environmental and social costs and consequences should be considered in the transfer proposal.³³⁹

CONCLUSION 7: TEXAS SURFACE WATER LAW DOES NOT ENCOURAGE VOLUNTARY WATER CONSERVATION IN A WAY THAT REALLOCATES WATER TO WHERE IT IS NEEDED MOST.

The Texas legal and institutional mechanisms are inadequate to encourage water conservation across the broad spectrum of surface water users. Texas needs to move away from the punitive approach and restructure conservation strategies to offer incentives to users to conserve water and to penalize users for wasteful practices.

The Commission's conservation plan requirement is a positive step, but it does not link plans with incentives, nor does it apply to all users. Currently, conservation plans are required for new water permits, transfers and permit amendments. Existing permit holders are not required to develop and implement conservation plans. Generally, agricultural irrigators are not required to have a plan. It is estimated that only 5 percent of the total water appropriated through the permitting process is covered by the conservation plan requirement.³⁴⁰

³³⁹ Nebraska has developed a set of criteria in its interbasin transfer statute that incorporates many of these principles. The statute contains a section expressing a legislative intent that "recognizes the need to delineate factors for consideration by the Director of Water Resources when evaluating an application made pursuant to §46-233 which involves an interbasin transfer of water in order to determine whether denial of such application is demanded by the public interest." The factors to be considered include: (1) the economic, environmental, and other benefits of the proposed interbasin transfer, (2) any adverse impacts of the proposed interbasin transfer and use, (3) any current beneficial uses being made of the unappropriated water in the basin of origin, (4) any reasonably foreseeable future beneficial uses of the water in the basin of origin, (5) the economic, environmental and other benefits of leaving the water in the basin of origin for current or future beneficial uses, (6) alternative sources of water supply available to the applicant, and (7) alternative sources of water available to the basin of origin for future beneficial use. [Neb. Rev. Stat. §46-289].

³⁴⁰ Alwin, Texas Water Resources Management: A Critical Review, A Report of the Texas Auditor, SAO Rept # 3-081 (March, 1993), p. 26.

Canceling the water rights of users for non beneficial use, waste, or non-use is the second strategy employed by the Commission. This strategy could make additional water available for other uses but it would be at a high economic and political cost. Additionally, it is rife with factual difficulty. The Commission lacks accurate and current data to assess the differences between actual use, beneficial use, consumptive use, waste and non-use for individual right holders on nearly all the river basins in the state.³⁴¹ One exception is the Lower Rio Grande where a watermaster monitors water uses. Perhaps the Commission recognized these problems by delaying plans to institute cancellation proceedings for 10 years after a stream has been adjudicated.³⁴²

It is difficult to imagine how the "use it or lose it" take away rule encourages conservation. Water saved by conservation practices reverts to the state for reappropriation elsewhere. By rule, the Commission has attempted to soften this disincentive by indicating that they will not move to cancel water saved through conservation practices. The legal authority of the Commission to adopt such a rule could be called into question. Legislative clarification would remove this legal doubt.

A market-based approach is needed in Texas to eliminate waste and encourage conservation. This requires that rights to the conserved water accrue to the conservor and that they be well-defined and transferrable. Economic self-interest, based on the ability to market conserved water, will help ensure that water is used for its highest and best use.

RECOMMENDATIONS:

The Legislature should consider the following statutory provisions and policy options:

³⁴¹ The Commission has not maintained up to date water rights data files on all basins which makes it difficult to determine which basins are overappropriated. See note 302

³⁴² *Id.* p. 25.

- Amend the water code to define conserved water and to authorize the conservor to market a portion of that water.
- Require that a portion of the conserved water be left in the stream to protect public environmental values.
- Require that all water users develop and implement a water conservation plan.³⁴³

In the event that the Legislature fails to act, the Commission by rule should consider adopting these options. In addition, the Commission should

- Reinvigorate the water rights cancellation program to deal with the problem of waste and non-use and
- Implement the water master program on selected major river basins, or alternatively maintain an accurate water rights data base for these basins.

CONCLUSION 8: SIGNIFICANT POTENTIAL EXISTS FOR RECYCLING MUNICIPAL EFFLUENT AS A MEANS TO PROVIDE ADDITIONAL WATER SUPPLIES FOR GROWING CITIES.

Approximately 2.4 million acre-feet of treated effluent was returned to river

³⁴³ Given the number of water utilities involved and the limited number of TNRCC staff, implementation of this recommendation may be problematic. As an alternative to universal application for all water rights holders, the 100 largest non-hydroelectric water rights holders could be encouraged to develop such plans. According to water rights permit data from the TNRCC, the 100 largest water rights holders control 91 percent of the total state authorized diversions.

Currently, all utilities borrowing more than \$500,000 from the Texas Water Development Board are required to develop a water conservation plan. See 31 Tex. Admin Code §363.15.

streams by municipalities throughout Texas in 1993.³⁴⁴ There is no clear indication from the data provided to us by the Commission that there was or is any significant reuse of this water by the providers of the effluent.³⁴⁵

There are many potential uses for reclaimed water permitted under Chapter 310 of the Texas Water Code: irrigation for agricultural purposes; irrigation of restricted landscape areas (e.g., golf courses, median strips); irrigation of unrestricted landscape areas (e.g., parks, residences); landscape impoundment, restricted recreational impoundment, or ornamental fountains; commercial and industrial use; and, toilet flush water. Each use is subject to review by the Commission.

Commission rules recognize that appropriators have the right to contract to sell treated effluent and that each permit holder may market and transfer it by way of pipeline, channel or tanker vehicle. It is unclear whether transfers may occur via natural stream, although it is not explicitly prohibited in this section.³⁴⁶

The legal nature of effluent poses some problems since there has not been litigation regarding the reclamation of sewage effluent by municipalities.³⁴⁷ According to the Texas Supreme Court's decision in *LCRA v. Texas Department of Water Resources*, return flows should not be considered "unappropriated waters," because return flows are not mandated and should not be *expected* from a permit holder.³⁴⁸ The Texas Supreme Court has stated more specifically that municipal sewage effluent that is returned to a natural stream *is* appropriable, but that the

³⁴⁴ Based on permitted discharges allowed by the Commission.

³⁴⁵ About 4 percent of this water may have been recycled. See Texas Water Development Board, Water For Texas, 1990, Austin, p. 2-13.

³⁴⁶ Appropriators may obtain a "bed and banks" permit to transfer water. See Tex. Water Code § 11.042.

³⁴⁷ Skillern, Texas Water Law, Volume 1, (1993), p. 80.

³⁴⁸ Boadu, Frederick O., Recycling Municipal Effluent, Texas A&M University, Department of Agricultural Economics, *Unpublished Paper*, p. 12.

rights of downstream users are not superior. Municipalities cannot be forced to continue discharging effluent into streams, even if the downstream appropriators are dependent upon the effluent as their water source. This would preclude the municipality from opting for more economical or environmentally sound options in the future.³⁴⁹

An obstacle to marketing treated sewage effluent is the controversy regarding its definition under Texas water law. Water rights differ depending upon the nature of the water in question. Some argue that treated sewage effluent is developed water and is therefore owned by the producer; some argue that it is not appropriable because it is not water that can be depended upon as a steady source (i.e., "wastewater only exists as long as there is waste"³⁵⁰); and, some argue it is appropriable water once it enters a natural stream.

Instream flows will continue to be an important issue; however, they are not recognized as a beneficial use in Texas law and are therefore afforded only minimal legal protection.³⁵¹ Many rivers in Texas are dominated by return flows,³⁵² and it could therefore be argued that return flows should be required in certain cases to ensure proper river levels. In this sense, the public trust doctrine may empower courts to protect instream uses.

RECOMMENDATIONS:

In conjunction with the Commission, the Texas Water Development Board operating through the Water Bank should:

³⁴⁹ Skillern, Texas Water Law, Volume 1, (1993), p. 82.

³⁵⁰ *Arizona Public Service Co. v. Long*, 160 Ariz. 429, 773 P.2d 988 (Ariz. 1989).

³⁵¹ Jensen, Ric. "Keeping Streams Flowing: In-Stream Flow Issues Involve Water Development, the Environment, and Even Snakes and Dinosaur Tracks," p. 2.

³⁵² Jensen, Ric. "Reclaiming Wastewater: Proposed New Regulations Treat Effluent as a Resource, Not Something to be Wasted," p. 5.

- Determine the maximum amount of municipal effluent that may be re-used without causing undue harm to base flows and downstream appropriators.
- Establish the target market for reclaimed water. The Bank should determine whether their marketing efforts should focus strictly on agricultural and industrial uses or include industrial and municipal uses.

CONCLUSION 9: THE TEXAS WATER BANK SHOULD SERVE AS CLEARING HOUSE FOR WATER MARKETING INFORMATION AND AS A TOOL TO PROMOTE WATER CONSERVATION.

The Texas Water Bank created by the 73rd Texas Legislature allows the Water Development Board to play a more proactive role in drought management and in water marketing by facilitating the sale and transfer of water and water rights throughout the state. The authority granted to the Bank provides great latitude in allowing it to actively engage in water marketing and to facilitate transfers through regional banks.

Aside from the potential to purchase, hold and transfer water rights, the Bank can also serve as a clearinghouse for water market information. This may prove to be one of the most important functions of the Bank in encouraging the development of water markets. The water marketing literature and case studies of transfers indicate that an important predicate to a successful water transfer and marketing program is the availability of market information.

RECOMMENDATIONS:

The Texas Water Development Board should:

- Develop a data base of water marketing information and operate as a clearinghouse, much like a multiple listing service in real estate.

- Develop a handbook or other publications to explain to potential buyers and sellers how to structure market transactions. This might include case studies on successful transfers.
- Develop in conjunction with the Texas Parks and Wildlife Department and other interest groups a water donation program to provide water for environmental uses.
- Seek to clarify and ameliorate liability concerns of water sellers about long term obligations resulting from short term transfers. The Bank should seek legislative assurances that water suppliers do not have any legal obligations to furnish water to purchasers beyond the terms of the transfer agreement.

In order to encourage transfers of water rights to the Water Bank, the Texas Natural Resource Conservation Commission, in consultation with staff from the Bank, should consider:

- Instituting cancellation proceedings on selected rivers.³⁵³

CONCLUSION 10: RIVER AUTHORITIES IN TEXAS CAN PLAY A SIGNIFICANT ROLE IN FACILITATING WATER TRANSFERS.

River authorities occupy a unique niche in the Texas water infrastructure. As political subdivisions of the state, they are uniquely organized on the basis of river basins, rather than on political boundaries. While they are public entities, they receive no state or local tax appropriations but must rely on revenues from their water supply, wastewater treatment and electric power operations to operate. This makes them very revenue conscious and interested in transferring water to the

³⁵³ One of the reasons for the success of the lower Rio Grande Valley water marketing program was institution of cancellation proceedings. Jensen, R., *The Texas Water Market*, 13(2) *Texas Water Resources* 4 (Spring 1987).

highest paying customers.³⁵⁴

Any water marketing program in Texas cannot ignore the impact that river authorities have on the marketplace. River authorities own and operate 22 major water supply reservoirs with a combined storage capacity of over 10 million acre-feet of water. The 8 largest river authorities hold water rights to more than 6 million acre feet of water supplying about 20 percent of the consumptively used surface water in the state.³⁵⁵ Their ownership and control of this amount of water gives them very monopolistic powers that can frustrate the development of regional water banks.

RECOMMENDATIONS:

The Texas Water Development Board should:

- Involve river authorities in the planning and development of regional water markets and regional water banks to facilitate water transfers.

**CONCLUSION 11: WATER MARKETING MAY PROVIDE WATER FOR
INSTREAM USES TO MAINTAIN AND PROTECT PUBLIC
ENVIRONMENTAL RESOURCES AND MINIMIZE THE
USE OF THE PUBLIC TRUST DOCTRINE TO REALLOCATE
WATER FOR THESE PURPOSES.**

Prior to 1985 Texas did not recognize and consider providing minimum instream flows to maintain the environmental and ecological integrity of riverine and estuarine systems. Thus, the state has allowed the full appropriation of many

³⁵⁴ Harper and Griffin, *The Structure and Role of River Authorities in Texas*, 24 *Water Resources Bulletin*, 1317 (1988).

³⁵⁵ Data furnished by Texas Water Development Board, Water Supplies Section using data from the Texas Natural Resources Conservation Commission.

rivers without any reservation of water for these vital public purposes.³⁵⁶ Because many basins are fully or over appropriated, reallocation of water from existing uses to these environmental needs will be difficult to achieve.³⁵⁷ While the cancellation of unperfected rights, appropriation of the small amount of unappropriated water, or amendment of existing water rights to reallocate water to meet future instream needs have been suggested each has technical, legal and political problems. Without a strong legislative mandate, the Commission will be constrained to act on the issue.

As discussed in Chapters III and IV, the judicially created public trust doctrine may be invoked to reallocate water from existing uses to protect environmental values. The doctrine is often used as a remedial device where there has been a failure of the system to protect the public interest. The water marketing and conservation recommendations outlined in this Report provide a mechanism to address public interest and environmental needs and thus help minimize the need to apply the public trust doctrine to reallocate water for environmental needs.

³⁵⁶ This discussion draws from an interagency memo of January 15, 1993 from Jesus Garza, Executive Director of the Texas Water Commission to John Young, Office of the State Auditor. The memo is contained in Alwin, Texas Water Resources Management: A Critical Review, A Report of the Office of the Texas State Auditor, SAO Rpt # 3-081, (March 1993) pp. 48-51.

³⁵⁷ There is little or no water available for new appropriation in these basins: (1) the Canadian River upstream of Lake Meredith; (2) the Red River upstream of Lakes Kemp and Arrowhead; (3) the Cypress River upstream of Lake O' the Pines; (4) the Sabine River upstream of Lakes Tawakoni and Fork; (5) the Neches River upstream of Lake Palestine; (6) the Trinity River upstream from Dallas/ Ft. Worth reservoirs; (7) the Brazos River upstream from Possum Kingdom Lake; (8) the Colorado River; (9) the Guadalupe River upstream of Canyon and Coletto Creek Reservoirs; (10) the San Antonio River upstream from Lakes Medina and Applewhite; (11) the Nueces River upstream from Zavala/ Dimmit counties water rights; and (12) the entire Rio Grande River. See Texas Natural Resources Conservation Commission, A Regulatory Guidance Document for Applications to Divert, Store or Use State Water--A DRAFT, Austin, March 22, 1994.