

**Coming Up for Air
in the
Sea of Texas Water Planning Policy**

**Mark B. Taylor
Attorney-at-Law
130 E. Sierra Circle
San Marcos, Texas 78666
512.754.0485
markbtaylor@grandecom.net**

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Introduction and Background

I want to accomplish two things with this paper and presentation –

1. Summarize the state water supply planning process and the newest state water plan, and
2. Explore challenges for Texas city attorneys in water supply planning and policies

My theme is this: Texas cities that need to provide additional water supplies are caught in a tempest of uncertainty about meeting those needs. This is the result of many factors, but I intend to focus on three challenges that I think should be of interest to Texas city attorneys:

- The high cost of implementing new water strategies
- A lack of settled law in some key areas
- Mixed signals on water policy from the state legislature

Factoids

I'm told by a friend in the planning profession that any worthwhile planning discussion must be premised on data. So here's include some factoids from the current state water plan, *Water for Texas 2007*¹:

	2000	2060
State population	21 million	46 million
State water demand	17 million acre-feet	21.6 million a-f
Capacity of existing water supply	17.9 million a-f	14.6 million a-f (due to reservoir sedimentation and aquifer depletion)
New water supplies needed		8.8 million a-f
Estimated cost		\$30.7 billion (2007 dollars)

That stuff is pretty dry, isn't it?² How about these?

- 72% of Texans don't know for sure where their water comes from³
- Average state fee for use of state-owned surface water, per acre-foot: 22¢⁴; average charge by a river authority for raw surface water, per acre-foot: \$100
- Rates for 5,000 gallons of residential water: \$3.75 in Lakewood Village; \$159 in Dilley⁵

¹ The plan is online at http://www.twdb.state.tx.us/publications/reports/State_Water_Plan/2007/2007StateWaterPlan/CHAPTER%201%20FINAL%20113006.pdf.

² No pun intended.

³ Texas Water Development Board, Water Conservation Quantitative Research Report Summary, 2004.

⁴ Remarks of Commissioner Larry Soward to the State Bar of Texas Water Law Conference, May 8, 2008. This consists primarily of watermaster fees.

- Average monthly residential water use: 1,700 gallons in Grand Salina; 71,000 gallons in Westlake⁶

For most people in Texas, there are only two important aspects to water supply:

1. Does water comes out when I turn on the faucet?
2. How much is my monthly water bill?

For most people in Texas, the water in the faucet comes from, and the monthly bill is paid to, a municipality. Texas cities form the backbone of retail water supply in the state because they traditionally have owned and operated the water distribution systems in the urbanized areas.

Texas cities continue to be among the fastest growing in the nation.⁷ With population growth comes the challenge to cities of providing new water supplies. This challenge would be substantial even if our basic legal principles, and our state policies, and our markets and transfer mechanisms for water were well-established, stable and predictable. But the reality - that our basic legal principles for water are unsettled, our state policies have not been consistent, and our markets and transfer mechanisms are years away from being stable and predictable – means that meeting future needs will pose a much greater challenge to Texas cities.

Disclaimer: Some of the policies and processes I discuss in this paper involve conflicts between areas of need and areas of surplus. The part of the state I call home is an area of need. So that's why you may see a tendency in this paper to favor areas of need.

⁵ Texas Municipal League 2007 Water and Wastewater Survey

⁶ *Id.*

⁷ According to U.S. Census Bureau data released on March 27, 2008, among the ten MSAs with the greatest population gains from July 2006 to July 2007 were: No.1 - Dallas-Fort Worth-Arlington, No. 4 - Houston-Sugar Land-Baytown, No. 8 - Austin-Round Rock, and No. 10 - San Antonio

Water Planning in Texas

“Planning is an unnatural process; it is much more fun to do something.
The nicest thing about not planning is that failure comes as a complete surprise,
rather than being preceded by a period of worry and depression.” - Sir John Harvey-Jones

The State Water Plan – Background and Process

Before Senate Bill 1 was enacted in 1997, state agencies adopted official water plans for the state in 1961, 1968, 1984, 1990, 1992, and 1997. All of these can be described generally as identifying water needs, cataloging current supplies, identifying areas with surplus supply, and proposing to use that surplus to meet water needs in other areas. They can also be described as taking a top-down, centralized planning and governance approach, and I think it would be fair to say that none of them achieved widespread support or implementation.

With the enactment of Senate Bill 1 in 1997, the legislature decided to take a drastically different, “bottom-up” approach – the state water plan is actually the Water Development Board’s compilation of regional plans developed by sixteen distinct regional water planning groups.⁸ The initial plan under SB 1 was adopted by the Water Development Board in 2002, and the regional plans and state plan are updated on a five-year cycle, most recently in 2007. A fifty-year planning period is used.⁹ Work is under way already on the next update due in 2012.

Each of the sixteen planning regions follows a similar process to formulate or update its part of the state plan. Current and projected population and water demands are quantified. Strategies for adding supply are evaluated based on quantity/reliability, financial cost, impacts to the environment and agriculture, impacts to water quality, and time to implement.¹⁰ The process must include significant public participation.¹¹ Mechanisms are provided to resolve “interregional conflicts” between the plans for different regions.¹²

Aside from the utility of the state water plan as a planning tool, what is the plan’s practical significance? There are two practical impacts for water supply projects:

⁸ TEX. WATER CODE §16.051(a). In addition to compiling the regional plans, the state plan must a) Include legislative recommendations that the TWDB believes are needed and desirable to facilitate “voluntary water transfers”; b) Identify “river and stream segments of unique ecological value”; and c) Identify “sites of unique value for the construction of reservoirs”. TEX. WATER CODE §16.051(e). If the legislature designates a river or stream segment to be of “unique ecological value,” the designation “solely means that a state agency or political subdivision of the state may not finance the actual construction of a reservoir” in the designated area. TEX. WATER CODE §16.051(f).

⁹ 31 TAC 358.3(a).

¹⁰ TEX. WATER CODE §16.053(h); see also the guidelines for regional planning in 31 TAC Chapter 357.

¹¹ TEX. WATER CODE §16.053(e)

¹² TEX. WATER CODE §16.053(h)(5), (6). Final authority to resolve interregional conflicts rests with the TWDB.

1. If a water supply project does not “address a water supply need in a manner consistent with” the state plan and the relevant regional plan, the project is ineligible for financial assistance from the TWDB.¹³
2. An applicant for a surface water permit must demonstrate that the permit would “address a water supply need in a manner consistent with” the state plan and the relevant regional plan.¹⁴

Water Management Strategies in the 2007 State Water Plan

Water for Texas 2007 identifies the following strategies for meeting water needs:¹⁵

1. **Municipal water conservation** (e.g., aggressive plumbing fixture replacement programs, water-efficient landscaping codes, water loss and leak detection programs, education and public awareness programs, rainwater harvesting, and changes in water rate structures)
2. **Agricultural water conservation** (improvements in water application technology; research and development of drought-resistant crops)
3. **Industrial water conservation** (mining, manufacturing, power generation)
4. **New and existing surface water** (including building new reservoirs to impound surface waters, and managing existing surface waters through various approaches, such as moving water from one area to another through pipelines, purchasing additional water through contracts with major water providers, obtaining additional water rights, reallocating water in existing reservoirs, and changing the operating framework for a system of reservoirs)
5. **Groundwater** (e.g., installing new wells; (2) increasing pumping from existing wells; (3) installing supplemental wells; (4) temporarily overdrafting of aquifers during drought conditions to supplement water supplies; (5) expanding treatment plants to make groundwater supplies meet water quality standards; and (6) transferring groundwater supplies from areas where projections indicate that surplus groundwater will exist to areas with water needs)
6. **Reuse - Direct** (after initial use, transported directly to a point of use) **and indirect** (discharged to a stream for transport and diverted downstream for reuse)
7. **Desalination** (brackish groundwater; seawater)
8. **Land stewardship** (such as brush control, to decrease evaporation and increase runoff/recharge)
9. **Conjunctive use of surface and groundwater** (e.g., a water provider uses surface water as its primary source of water supply and groundwater to meet peak day needs or to supplement supply during times of drought)

Groundwater Management Area Planning

Groundwater “management” in Texas is a relatively new phenomenon. Although the State Supreme Court declared early on that the “rule of capture” applied only in the

¹³ TEX. WATER CODE §16.051(j).

¹⁴ TEX. WATER CODE §11.134(b).

¹⁵ *Water for Texas - 2007*, Chapter 10.

absence of action by the state legislature,¹⁶ a statute authorizing the creation of groundwater conservation districts was not enacted in Texas until 1949.

In recent years, the legislature has enacted sweeping measures expanding groundwater planning. In Senate Bill 2 enacted in 2001, the TWDB was charged with designating groundwater management areas (GMAs) in the state based on aquifer boundaries. The TWDB adopted rules in November of 2002 dividing the state into sixteen groundwater management areas.¹⁷ In addition, SB 2 strengthened the requirements for groundwater districts to adopt and enforce management plans, and to share those plans with regional planning groups and adjacent districts. However, each district determined the quantity of available groundwater in its jurisdiction, independent of other districts; and regional planning groups were free to make their own recommendations to TWDB about groundwater availability to be included in the regional and state water plans.

In House Bill 1763 enacted in 2005, the Legislature recognized the need for groundwater districts to coordinate their management of aquifers with one another and with regional planning groups. The bill requires all groundwater districts within a GMA to cooperate to formulate “desired future conditions” (DFCs) for each aquifer.¹⁸ The GMA provides the DFCs to the TWDB, which uses groundwater availability models (GAMs) to translate the DFCs into a quantity of managed available groundwater (MAG) for each aquifer in the GMA.¹⁹ The GMA then apportions the available groundwater for each aquifer among the districts. Each groundwater district must incorporate the MAG figures into its district management plan, and “to the extent possible, ... issue permits up to the point that the total volume of groundwater permitted equals the managed available groundwater”.²⁰ The outgrowth of this process will be a target/cap on production from each aquifer in each groundwater district.²¹

The bill requires GMAs to furnish the available groundwater amounts for each aquifer and each groundwater district to the relevant regional planning groups for inclusion in the regional and state water plans. And the planning groups are *required* to include the GMA groundwater amounts in their regional plans.²²

¹⁶ *Houston and Texas Central Railroad Co. v. East*, 81 S.W. 279 (Tex. 1904).

¹⁷ The current GMA boundaries are contained in 31 TAC 356.

¹⁸ Examples of DFCs include a) water levels do not decline more than 100 feet in 50 years, b) water quality does not fall below 1,000 mg/l in total dissolved solids over a period of 50 years, c) springflow from an aquifer does not fall below 10 cfs during a drought, and d) 50% of the quantity of water in storage in the aquifer today will be available in 50 years. Robert Mace and others, “A Streetcar Named Desired Future Conditions: The New Groundwater Availability for Texas,” presentation to State Bar of Texas Water Rights Conference, May, 2008, p. 3.

¹⁹ If you are not hopelessly lost in the acronyms, you have realized that the MAGs are determined by analyzing the information from the GMAs with the GAMS.

²⁰ TEX. WATER CODE §36.1132.

²¹ Mace and others, “A Streetcar Named Desired Future Conditions: The New Groundwater Availability for Texas,” pp. 2-3.

²² TEX. WATER CODE §16.053(e)(3)(a). A regional planning group may, however, distribute the MAG amount in a different manner than the GMA does among its groundwater districts. If this occurs, TWDB attempts to resolve the matter, but a dissatisfied groundwater district may appeal to a district court in Travis County. TEX. WATER CODE §36.1072(g).

Presently the GMAs are working with the TWDB to model groundwater needs and desired future scenarios, and many will decide on their initial DFCs by year's end.²³ The TWDB will calculate the MAG amounts and provide them to the GMAs, which in turn will provide the information to regional planning groups for inclusion in the next state water plan in 2012.

The TWDB strongly encourages stakeholder participation in GMA processes to determine DFCs. Processes are available for stakeholders to appeal DFCs to the TWDB and to the TCEQ.²⁴

Kudos and Criticism for the State Water Planning and Groundwater Management Area Planning Processes

The regional planning process initiated under Senate Bill 1 has received praise for its regional, stakeholder-driven approach. The regional groups identify their needs and their preferred strategies for meeting those needs, and the state inherently defers to those preferences, giving stakeholders a sense of involvement in the process and ownership of the results. In light of the state's inability to implement the centralized, top-down planning measures in previous state water plans, perhaps the state's current approach is inevitable.

The regional planning process has not escaped criticism. For example, it has been criticized for overstating future water demands, for using unrealistic criteria for comparing water supply alternatives, and for failing to use benefit-cost analysis to evaluate water supply alternatives.²⁵ Moreover, the "bottom-up" regional approach inherently encourages a parochial "us versus them" perspective, and water management strategies that do not involve the sharing of available resources across regional boundaries.²⁶ This tendency, as will be discussed later, has been accompanied at times by

²³ TWDB has encouraged GMAs not to submit DFCs without knowing what the resulting groundwater availability amounts are. Mace and others, "A Streetcar Named Desired Future Conditions: The New Groundwater Availability for Texas," p. 4.

²⁴ TWDB review of DFCs is to determine if they are "reasonable". TEX. WATER CODE §§36.10. TCEQ review is to determine whether groundwater district rules and enforcement efforts are adequate to achieve the approved DFCs. With respect to enforcement of district rules, Senate Bill 1383 in 2007 amended TEX. WATER CODE §36.119 to create a process for filing complaints of violations of rules with groundwater districts, and to expressly authorize private suits to enforce rules after giving districts 90 days to resolve complaints. This addressed a situation involving the City of Amarillo, which had sued a groundwater permit holder that was violating the terms of its permit.

²⁵ Milton Holloway, "The High Cost of Texas Water Planning," Texas Business Review, December, 2001; Environmental Defense, "Economic Principles for Sound Water Planning: An Introduction for Regional Water Planning Groups in Texas," 2003, online at http://www.texaswatermatters.org/pdfs/economic_principles_report.pdf. One commentator has noted that "A water plan for a region with decentralized water management is likely to be more educational and define a framework or direction for common activity, and less likely to define a direct plan of action." Jay R. Lund, "Approaches to Planning Water Resources," November, 2002, online at <http://cee.egr.ucdavis.edu/faculty/lund/ftp/WaterPlanning.pdf>.

²⁶ An example is found in the policy recommendations of individual planning regions in *Water for Texas 2007*, p. 319: **Region F**: "Oppose modifying the junior rights provision until basin of origin needs are ensured by reviewing water availability models to determine there are no detrimental impacts"; **Region N**: "Repeal junior rights provision and additional application requirements for interbasin transfers".

conscious policy choices by the state legislature that also tend to pit one region against another.

Similarly with respect to the GMA planning process, opinions vary on the legislature's empowerment of local groundwater districts. As you might expect, some prominent commentators in this area disagree. Two of them say that although districts take a variety of approaches to regulation, "the possibility of harming one's neighbor under the rule of capture has been addressed by virtually all [groundwater districts]".²⁷ They conclude by stating "the rule of capture in combination with regulation by local option groundwater conservation districts has proven to be an effective means of developing and managing Texas' groundwater resources".²⁸

Another commentator, on the other hand, has argued that many local groundwater districts are not up to the challenges they face when balancing local needs with those of growing urban areas that need groundwater from rural areas. "Districts are largely underfunded and staffs may be very small. Boards are charged to act as both elected representatives and impartial adjudicators in the face of enormous local political pressure".²⁹ Increased oversight of districts by state agencies, and greater allowances for judicial review of district decisions "could restore meaningful checks and balances to groundwater management".³⁰

Now let's shift our discussion to some of the significant challenges facing Texas cities with respect to future water supply.

City Water – Still a Bargain – But for How Long?

I'll use a story to illustrate the bargain we have with city water.

I've heard several water lawyers begin a talk by pointing to a pint of bottled water that cost a dollar and say "That water is worth \$2,600,000 per acre-foot". Well, let's figure. At \$5/1,000 gallons, an average municipal rate in Texas, a pint of water costs 6/100 of one cent. Your dollar will buy you 1,600 pints, delivered to you in your home or business.

Yet the past and present cheapness of municipal water supply has become part of the problem – tapwater in Texas is priced as a commodity (per thousand gallons), as is raw water (per acre-foot, about 326,000 gallons), and that goes hand-in-hand with the fact that virtually all of the common ways of providing supplies today are the cheapest ways – the low hanging fruit, you might say. What lies in our future, however, are supply strategies for which the unit cost is several times the cost of our existing supplies. While the current cost of raw water delivered for treatment to Texas cities varies widely, I understand it averages about \$50 per acre-foot. Compare that with the costs for various water strategies being considered for additional supplies in Appendix B, which range from \$77 to \$1,244

²⁷ Id. at p. 9.

²⁸ Id. at p. 16.

²⁹ P. Steven Kosub, "Is Local Control of Groundwater Viable?," presentation at the University of Texas 2007 Texas Water Law Institute, p. 9.

³⁰ Id. at p. 10.

per acre-foot. Although water supply costs are only a portion of the overall cost of providing municipal water, big increases in water supply costs will mean significant increases in water rates.

Unsettled Law Means Uncertain Water Planning

What does a groundwater owner own?

City of Del Rio v. Clayton Sam Colt Hamilton Trust, No. 04-06-00782-CV (Tex. App. – San Antonio, February 27, 2008).

We all know that groundwater in Texas is privately owned. But what does it really mean to own groundwater? The two schools of thought on that subject collide in this case, each supported by language in decades-old case law.

One theory is the “absolute ownership” theory - that groundwater is owned in place by the owner of the land. Under this theory, the landowner can sell or lease that physical part of the land just like the landowner could sell coal, or gravel, or uranium ore found within the land.

The other theory – I call it the “right of use theory” – is that groundwater is not “owned” by a landowner until it is produced at the surface. Under this theory, a landowner has a “usufructuary” right to produce and use groundwater from wells on the land, but the landowner does not own the water itself until it is withdrawn at the surface. Advocates of this theory say that the right to produce groundwater from a given tract of land is a valuable and transferable right even though the water itself is not owned until produced.

You’d think that after 163 years of statehood and legislative enactments and common law jurisprudence, we’d have tied this one down by now. Well, we haven’t, but it looks like we may be getting close.

The City of Del Rio purchased a fifteen acre tract of land out of a larger tract owned by the Trust. In the deed, the Trust reserved “all water rights” in the property, but gave up the right to use the surface of the fifteen acres to drill any wells.

The City proceeded to drill a well on the property. The Trust sued the City, claiming that the reservation of groundwater rights was valid based on the absolute ownership theory. The City took the position that the Trust’s reservation of groundwater rights was ineffective, based on the right of use theory. Now I’ve heard it said that the City’s argument was that groundwater rights cannot be reserved in a conveyance. But that’s not the whole story. Under the City’s argument, the reservation was ineffective because the Trust expressly gave up the right to use the surface of the tract to produce water from it. Kind of like having an easement for a water line, but no access rights to use the surface to maintain the line once it’s completed.

The San Antonio Court of Appeals issued an opinion on February 27, 2008, siding with the Trust. I found this portion of the court’s opinion interesting:

The Trust calls [the City’s] argument ... its "bucket" argument. The Trust reasons that if a property owner's interest in groundwater only vests once the water is reduced to

possession, then groundwater conveyances "would essentially be defined by the size of the bucket transporting the water."

In other words, only when the groundwater is drawn to the surface and placed in a container for transport off the surface would a conveyance or reservation be effective. A landowner could not create a *present* transfer of a groundwater interest in place even if the parties contemplated pumping the water to the surface the next day. Each time one wished to convey groundwater, the landowner would first have to raise the water to the surface, and then deliver it to the transferee. The sheer practical complexities of the City's position would essentially bring to a standstill any attempt to transfer groundwater in this State.

Now how often do you find an appellate court with such a pronounced concern for practical policy implications?

The court also responded to the City's argument that the groundwater cannot be severed when all rights of access to the surface estate are relinquished, saying that because the Trust owned land adjoining the City tract, the Trust could drain the water from the City tract by drilling wells on its remaining property. I'm not sure what this means if someone sells an entire tract of land and attempts to reserve water rights without also reserving drilling rights.

Motions for rehearing and rehearing en banc are pending at the Court.

When does a groundwater regulation violate constitutional rights?

Bragg v. Edwards Aquifer Authority, Civil Action No. SA-06-CV-1129-XR, pending in the U.S. District Court, Western District of Texas, San Antonio Division.³¹

City attorneys are familiar with the long line of cases that draw the line between the exercise of the police power and compensable takings. While the line is blurry at times and often depends on case-by-case fact issues, we know the basic principles. Does a regulation deny a property owner all economically viable use of the property? Does a regulation unduly interfere with reasonable investment-backed expectations?

Yet these are novel concepts to Texas groundwater law. Here it is 2008, and we await guidance from the courts similar to that which land use attorneys got in 1926 in *Village of Euclid v. Ambler Realty*. Why so far behind? Part of the problem is described above – we still don't know what a groundwater owner owns. Another factor is the language in the older cases characterizing groundwater as subject to "absolute ownership". To some landowners, the fact that your neighbor can't sue you for drying up his well means a groundwater district can't tell you how much to pump either. Is this some form of "super ownership" that is immune from all government regulations?

In determining the impact of a regulation on land value, must the value of groundwater be considered separately from the land as a whole?³² Many landowner attorneys I know think so.³³

³¹ You might ask why I'm using trial court rulings to illustrate this issue. Believe it or not, I have not found any appellate court opinions on "as applied" constitutional challenges to groundwater district rules.

³² The legislature hasn't helped much here. In House Bill 803 (2003), Property Code Section §21.0421 was enacted requiring the value of groundwater rights to be determined as property apart from the land in

Let's talk about the Braggs. They own two tracts of land used for pecan orchards, and they applied to the EAA for a permit for each tract. The EAA denied one because the well on the tract was not drilled until after the statutory historic period, and issued one for the other tract in a smaller quantity than the Braggs had requested. The Braggs filed this suit in state court in 2006, pleading federal equal protection and due process claims, and state (but not federal) takings claims. The EAA removed the case to federal court. In January of 2008, the Court denied the Braggs' Motion for Partial Summary Judgment on their state takings claims, finding that the denial of the Braggs' application for the tract that had no historic use was not a "physical taking" nor a "categorical regulatory taking" of the groundwater underneath the tract. The Court stated:

Plaintiffs must show how the denial of the D'Hanis Orchard application extinguishes all "economically beneficial or productive use" of the property's groundwater estate. ... In determining whether a land retains economic value, the inquiry is not whether the property owners can profitably pursue any enterprise of their choosing, but rather, as the Texas Supreme Court articulated, whether the regulation "renders the property valueless. In other words, as the Texas Supreme Court also expressed, a finding that an owner has been deprived of all economically beneficial use of his land is "limited to the extraordinary circumstance when *no* productive or economically beneficial use of land is permitted and the landowner is left with a token interest."

Plaintiffs have presented no evidence establishing they are left with only a token interest, nor could they reasonably do so. The D'Hanis Orchard consists of forty plus acres of land in central Texas, with unencumbered access to non-Aquifer water resources and limited access to the Edwards Aquifer. While the EAA's regulatory actions may well contribute to the economic infeasibility of operating a pecan orchard on the property, an admittedly irrigation intensive commercial pursuit, it does not stand to reason that the denial of the D'Hanis Orchard application results in no economically viable pursuits left available to Plaintiffs on the property.

Accordingly, because the Court does not find that Defendants' actions eliminated all "economically beneficial or productive use of land," there has not been a categorical regulatory taking for which summary judgment could be granted. Therefore, to find whether a regulatory taking has occurred, the Court must engage in the factually dependent investigation outlined in *Penn Central*, a task inappropriate for this procedural stage.

In March of 2008, the Court granted the EAA's Motion for Partial Summary Judgment on the Braggs' federal claims. Among the court's conclusions were a) the EAA did not deny equal protection to the Braggs by extending the time to register wells exempt from permitting, while not extending the historic use period for wells requiring permits, because the distinction met the rational basis standard (exempt wells use less water), and b) the Braggs were not denied due process when the EAA staff encouraged them to seek an extension of the historic use period in the legislature, and then the EAA lobbied against the extension. The case was remanded to state court for further action.

eminent domain cases. Interestingly, the same bill prohibits an appraisal district from appraising groundwater rights separately from the real property.

³³ While at face value this may seem unreasonable, the reality is that in some parts of the state, the value of groundwater rights equals or exceeds the land value. Edwards Aquifer permit rights, for example, have risen to \$5-6,000 per acre-foot; with the statutory minimum of two acre-feet of permit rights for each acre of irrigated farmland, the permit rights easily exceed the land value in many cases.

Is a preference given to a groundwater right based on historic use transferable to a new and different use?

Guitar Holding Company, L.P. v. Hudspeth County Underground Water Conservation District No. 1, et al., 209 S.W. 3d 146 (Tex. App.—El Paso 2006, pet. granted)

Think the age-old battles between farmers and ranchers in Texas are over? Well, think again!

In this case, the groundwater district adopted rules that favored existing uses of water over new uses of water, a common feature in groundwater permit rules, and a preference expressly allowed under state law.³⁴ Being far west Texas, those who had used the most water historically – irrigating farmers – secured larger, more reliable permits (based on intensive water use on small areas of land) than much larger ranch properties that had less existing use.³⁵

Here, the farmers with the larger, more senior permits sought to market their permit rights for municipal use far away from Hudspeth County. The District’s rules expressly allowed for export of water, and did not alter the favored priority of the farmers’ permits if they changed from irrigation to municipal use. The ranchers sued the District on a variety of theories, including takings and other constitutional violations predicated on the ranchers’ “absolute ownership” of the groundwater beneath their land. The parties agreed to stay the constitutional issues while they argued over the interpretation of the statute allowing the District to grant preferred status to permits based on “existing use”.³⁶ The ranchers argued that “existing use” means not just the *amount used* but also the *purpose of use*. In other words, it’s okay for the District to give farmers large, reliable permits, but the farmers can only use the water for irrigation; they cannot export it for municipal use. The farmers countered by arguing that the ranchers’ interpretation flies in the face of groundwater district practices throughout the state, and would disrupt the transfer of groundwater to areas of the state that need it.

The State Supreme Court heard arguments in the case on December 5, 2007, and we are awaiting a decision. If the Court sides with the District on the statutory interpretation issue, the trial court will still have constitutional claims before it. Is it a compensable taking or denial of equal protection for the District to issue a permit for only 232 acre-feet per year to the owner of a 38,000 acre ranch, while granting a permit for 4,000 acre-feet per year to the owner of a 1,100 acre farm, when it’s the same aquifer beneath both tracts of land? The future will tell.

How do we protect environmental needs in rivers, bays and estuaries?

Option A - Apply for a water right to leave water in the river

³⁴ TEX. WATER CODE §36.116(b) provides “In promulgating any rules limiting groundwater production, the district may preserve historic or existing use before the effective date of the rules to the maximum extent practicable consistent with the district’s comprehensive management plan . . .”

³⁵ Guitar owned 38,296 acres, but received a reliable “validation” permit for only 57.96 acre-feet per year. A farmer with 1,094 acres (987.30 in irrigation) received a validation permit for 3,949.20 acre-feet/year.

³⁶ Interestingly, preferences for permits based on historic groundwater use resemble the “first in time, first in right” prior appropriation system that applies to surface water rights.

Texas Comm'n on Environmental Quality, Guadalupe-Blanco River Authority, San Antonio River Authority, and San Antonio Water System v. San Marcos River Foundation, No. 13-06-00326-CV (Tex. App. – Corpus Christi, notice of appeal filed May 22, 2006).

Many years ago, while I worked for the City of San Marcos, we filed an application to appropriate water from the San Marcos River in a quantity in excess of the City's current needs. When our friends at the River Foundation asked us about the excess quantity, we told them, "If we don't use it, it will stay in the river". Imagine that – a water rights permit to make sure water *remains in the river*.

Well, our friends at the River Foundation took that to heart. As of the time the River Foundation filed its application for 1.3 million acre-feet of San Marcos and Guadalupe River water in July of 2000, state law and agency rules appeared to expressly authorize surface water permits to be issued for instream flows; that is, a permit to appropriate state water for the purpose of leaving the water in the river. Matter of fact, the River Foundation applied for the exact amount of water that the state's own studies found to be necessary for the health of the rivers and the bays and estuaries fed by them along the coast. The agency staff pronounced the application complete and it received a priority date.

Politics then intervened in the administrative process, and in 2003 the TCEQ voted to deny the application on the basis that the agency had no authority to consider it. This lawsuit resulted. The trial court granted the River Foundation's motion for summary judgment in February of 2006, and the state appealed. The Corpus Christi Court of Appeals heard arguments in the case on October 25, 2007, and we are awaiting a decision.

I mention this case not only because of the connection to San Marcos, but also to note that this application has served as a catalyst to the state-wide process now under way to determine the level of flows needed to protect the health of our rivers, streams, bays and estuaries.

Option B: Appoint a commission, study the issue, and make recommendations to the legislature.

See the discussion below of legislative direction on environmental flows.

What authority do groundwater districts have over municipal water systems?

Rolling Plains Groundwater Conservation District v. City of Aspermont, No. 11-007-0009-CV (Tex. App. – Eastland), May 8, 2008.

How does the sovereign immunity of a city affect the ability of a groundwater district to enforce its rules against the city and collect fees from the city?

Prior to the 2003 state legislative session, the wells supplying the City were exempted under TEX. WATER CODE §36.121 from the district's rules. The 2003 legislature amended this statute in a manner that removed the exemption. Since 2004, the City did not comply with the District's rules requiring the filing of monthly reports and the payment of export

fees. The District sued the City, seeking recovery of the unpaid fees and penalties, and seeking a declaratory judgment that the City was subject to the District's rules. The City sought dismissal of the suit on the basis of sovereign immunity. The trial court sided with the District, and the City appealed.

On appeal, the dispute boiled down to whether the removal of the exemption for Aspermont's wells in 2003 constituted a "clear and unambiguous" waiver by the legislature of Aspermont's immunity from suit. The Court of Appeals concluded it did not as to the District's claims for monetary relief, so the City was immune from those claims. As to the District's request for a declaratory judgment, the Court held that the City was not immune from suit and the trial court could proceed to determine whether the City is subject to and must comply with the District's rules.

There may be further proceedings in this case, of course. But given the significant role that cities play in providing funding for groundwater districts through permit and export fees, I would anticipate that the legislature will consider adding a waiver of immunity into the groundwater district statutes.

Mixed Signals from the Legislature

The legislature *discourages* marketing of *surface water* – Interbasin transfer restrictions in Senate Bill 1

Since the Stacy Dam decision in 1984,³⁷ the availability of surface water for new appropriations has been determined on the basis of the full exercise of existing water rights at their face value, rather than at lower levels that reflect actual use of the rights. While this decision reinforced the property interests of water right holders, it drastically reduced the amount of surface water available for new appropriations. With the reliable senior rights in river basins having already been issued, attention shifted to the process and substantive rules for transfer of water rights. Transfers can be permanent or temporary; they usually occur through a water right amendment process with the TCEQ; they can occur within a river basin, or across river basins.

Senate Bill 1 in 1997 enacted strong policies restricting the transfer of surface water across river basins, including a litany of procedural hurdles and a controversial provision making a water right that is transferred out-of-basin automatically junior to all other water rights in the basin of origin.³⁸

The protection of in-basin interests is certainly a criteria to be evaluated in determining whether to approve an out-of-basin transfer. However, the "junior rights" provision that puts a water right at the end of the line if transferred out of the basin has undermined markets that would otherwise exist for the voluntary transfer of surface water from areas of surplus to areas of need. In the words of one commentator,

the interbasin transfer statute promotes sectionalism among Texas citizens which is contrary to the state water planning process, and ... makes it very difficult if not

³⁷ *Lower Colorado River Authority v. Texas Dep't of Water Resources*, 689 S.W.2d 873 (Tex. 1984).

³⁸ TEX. WATER CODE §11.085; *see also* 30 TAC §297.18 (TCEQ rule on interbasin transfers).

impossible to resolve fundamental issues of water resource management in a relevant time period”.³⁹

In practical terms, the filing of applications for interbasin transfers has come to a virtual halt.⁴⁰ The policy has stymied projects such as the City of Corpus Christi’s water supply pipeline to Lake Texana that involved a voluntary interbasin transfer from the Lavaca-Navidad River Authority.⁴¹

The legislature *encourages* marketing of surface water by streamlining the water rights amendments process

Senate Bill 1 in 1997 included a provision⁴² intended to codify an existing agency process for streamlined processing of certain amendments to surface water rights and thus enhance their transferability. In essence, the provision allowed the TCEQ to approve an amendment to a water right administratively if the amendment would have no greater impacts than full exercise of the right prior to amendment. Being the product of our state legislative process, however, the provision was ambiguous in certain respects. The provision was interpreted by the State Supreme Court in the *City of Marshall v. City of Uncertain* case⁴³ as requiring TCEQ to review the potential impacts of water right amendments on a case-by-case basis in deciding whether an application is processed administratively, or through an evidentiary hearing process. Uncertain prevailed, so uncertainty prevails about the use of this provision to facilitate transfers.

The legislature *encourages* marketing of surface water by creating processes to quantify and set aside environmental flows

Since 1985, the protection of instream flows has been a required consideration in the granting of new permits for surface water. The determination of instream flow needs, however, was usually on a case-by-case and site specific basis, and broader geographic impacts and cumulative effects were not analyzed. It was in response to this system, and an allowance for permits to be issued for instream flows, that the San Marcos River Foundation filed its permit application in 2000 for virtually all of the remaining flows in the San Marcos and Guadalupe Rivers. The Legislature reacted to this in 2003 by enacting a bill imposing a moratorium on such permits.⁴⁴ Study committees in 2004 and 2006 made recommendations for processes to establish and protect environmental flows.

³⁹ Gwendolyn Webb, “Texas Water Rights Issues: Planning and Developing Municipal Water Supplies,” presentation to State Bar of Texas Water Rights Conference, May, 2008, p. 2. “[S]tatutory provisions penalize surface water transfers from one region to another and cause inefficient water planning. Eventually, population growth and drought conditions may dictate whether the legislature authorizes surface water transfers with a preservation of the priority dates of the water rights transferred.” Texas Water Advisory Council, 2004 Report, p. 4. The report is online at http://www.senate.state.tx.us/75r/Senate/commit/c580/downloads/rpt_twac_jan2005.pdf.

⁴⁰ Todd Votteler, Kathy Alexander and Joe Moore, “The Evolution of Surface Water Interbasin Transfer Policy in Texas: Viable Options for Future Water, Water Grabs, or Just Pipe Dreams?,” State Bar of Texas Environmental Law Journal, Vol. 36, p. 125 (Spring 2006).

⁴¹ A description of the Mary Rhodes Memorial Pipeline Project is on the web at http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/pd/020/98-03/corppipe.pdf

⁴² TEX. WATER CODE §11.122(b).

⁴³ 206 S.W.3d 97 (Tex. 2006).

⁴⁴ Senate Bill 1639 (2003).

In 2007, Senate Bill 3 and House Bill 3 established a process to quantify and protect environmental flows. The legislation created an Environmental Flows Advisory Group that will provide biennial reports to state officials. A separate study will be performed for each river basin with extensive stakeholder participation, and with a combination of policy and science perspectives. In response to the report for each basin, the TCEQ will establish environmental flow standards and set-aside amounts to protect environmental interests.⁴⁵ The set-aside amounts will have priority dates similar to state permits, and TCEQ is required to honor the amounts in issuing new permits and in amendments to existing permits that increase the permit amount. The authority of TCEQ to issue permits for instream flow protection is removed.⁴⁶ The TCEQ is allowed to make set-aside amounts available on a temporary basis for emergencies.⁴⁷

The legislation includes mechanisms for encouraging the voluntary dedication of existing water rights to the Texas Water Trust, but it does not otherwise provide for adjustments to existing water rights to protect environmental flows.

The setting aside of surface water for environmental flows will mean, of course, a decrease in future availability of water for other uses. On the other hand, once environmental flow standards and set asides are established, the amounts of water available for new water rights will be easier to determine. In addition, because the legislation does not provide for the reduction of existing water rights, the reliability and marketability of those rights is increased.

The legislature *encourages* marketing of *groundwater* by discouraging surface water transfers

Whether or not it was an intended consequence of the junior rights provision in Senate Bill 1, it has had the effect of increasing pressure for the development of groundwater rights, and may lead to production from some aquifers in excess of sustainable levels.⁴⁸

Increasingly, groundwater will be developed in rural areas, and groundwater historically used for agricultural purposes will be transferred to urban areas and converted to municipal and industrial use. While some of this may occur through conservation practices, allowing agricultural uses to be sustained to a degree, the long-term end result may be the disappearance of agricultural economies as the value of groundwater increases and landowners are increasingly tempted to transfer their rights for other uses.⁴⁹

⁴⁵ TEX. WATER CODE §11.1471.

⁴⁶ TEX. WATER CODE §11.0237.

⁴⁷ TEX. WATER CODE §11.148.

⁴⁸ “Limitations on surface water transfers, in some instances, encourage water suppliers to pursue groundwater transfers, which are only regulated by statutory and regulatory limitations of local groundwater conservation districts, where existent. A sole reliance on groundwater transfers may result in unnecessary costs and could be less efficient than surface water.” Texas Water Advisory Council, 2004 Report, pp. 5-6.

⁴⁹ An example of this involves the provision in the EAA Act that links a portion of permit rights to use on historically irrigated lands. EAA Act, §1.34(c). While this was included in the Act to protect the economies of agricultural areas, the Texas Farm Bureau recently endorsed a proposal to remove this restriction from the statute, to allow all permit rights on irrigated land to be transferred to other uses.

The legislature *encourages* marketing of groundwater by prohibiting groundwater districts from restricting exports of groundwater

The discussion of groundwater planning above describes the legislature's decisions in Senate Bill 2 (2001) and House Bill 1763 (2005) to empower groundwater districts to plan for the use of groundwater resources.

In stark contrast to the virtual shutdown of interbasin surface water transfers caused by the junior rights provision in SB 1, SB 2 included a provision prohibiting groundwater districts from imposing more restrictive permit conditions on exporting wells than on in-district users.⁵⁰ As you might guess, this has led to a dramatic increase in interest in the development of groundwater in areas where surplus supplies may be available.

The Legislature *gives mixed signals* on marketing of groundwater – the groundwater planning process creates short-term uncertainty and may limit availability, but will it bring long-term certainty?

Senate Bill 2 for the first time authorized groundwater districts to adopt rules limiting the production of wells.⁵¹ The GMA processes now under way to determine available groundwater amounts, to apportion them among districts, and then to apply them to permit applications, will take time, and groundwater markets will be unstable and speculative in the meantime.

Upon determination of the amounts of available groundwater, districts are to issue permits to the extent groundwater is available.⁵² If the available groundwater amount is viewed as a cap on total production from an aquifer in a district,⁵³ then the groundwater that could be produced if the cap was not in place will be lost as a possible source for marketing, transfer, and use. On the other hand, without a defined cap on production in place, market forces would have a much more difficult time determining the value of permit rights.⁵⁴

⁵⁰ TEX. WATER CODE §11.122(c).

⁵¹ The bill provision is codified in TEX. WATER CODE §11.116(a)(2).

⁵² I've heard water lawyers disagree about this, so help me interpret this language in TEX. WATER CODE §11.1132: "A district, to the extent possible, shall issue permits up to the point that the total volume of groundwater permitted equals the managed available groundwater, if administratively complete permit applications are submitted to the district." Does it mean a) a district *cannot* issue permits in excess of the available groundwater, or b) a district *must* issue at least that much, and it *can* issue more than that?

⁵³ Here again, comments that districts are ill-equipped to fairly establish groundwater permit rights, and judicial oversight of district decisions is lacking and may pose constitutional concerns, are worth re-noting. P. Steven Kosub, "Is Local Control of Groundwater Viable?," presentation at the University of Texas 2007 Texas Water Law Institute; Russell S. Johnson, "Groundwater Law, Groundwater Planning, and Groundwater Management," presentation to State Bar of Texas Water Rights Conference, May, 2008.

⁵⁴ The economic principle of the "tragedy of the commons" has been used to describe the overuse of a resource that leads to its depletion because it is owned by all, and therefore owned by no one. As noted by a prominent commentator, "Texas groundwater law permits the sale of groundwater but does not encourage the 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 or the purchaser exclusivity and enforceability of a right to a measured amount of water. The only amount of water that can be guaranteed is the amount that can be captured." Ronald Kaiser, "Legal and Institutional Barriers to Water Marketing in Texas," Technical Report No. 17, Texas Water Resources Institute, November, 1994, p. iii.

If caps are applied to production, then districts will be involved in allocate their available amounts as permit applications are filed. There will be winners and losers in the allocation process, and those who lose may resort to litigation testing the fairness of the decisions and the authority of the decision makers.⁵⁵

In the long term, the certainty of permits in a regulated system and the protection of critical resources against depletion will serve Texas well. In the meantime, buckle up for an extended period of uncertainty.

The legislature gives mixed signals about reuse

According to projections in the current state water plan, about 1.3 million of the 9 million acre-feet of new water supplies needed in the state in 2060 will be reuse water.⁵⁶ Keep in mind the distinction between *direct* reuse (after initial use, the water is transported directly to another point of use) and *indirect* reuse (after initial use, the water is discharged to a stream for transport, and an equivalent quantity is diverted downstream for reuse).

Direct reuse is encouraged by statute,⁵⁷ and authorized through an administrative approval process at the TCEQ.⁵⁸ However, for a variety of reasons, direct reuse for potable water supply has not undergone significant development in Texas.

While indirect reuse is more attractive for potable water supply, legislative direction on the subject has not been clear. This reflects the competing concerns of those who wish to reuse their water and those downstream who count on the water, once discharged, being available for their use. One Water Code provision addresses permits for indirect reuse of effluent derived from groundwater. The permits are treated much like new appropriations, allowing for protection of existing water rights and instream flows.⁵⁹ “[P]rior authorization” for such a reuse diversion is needed, implying that historic levels of discharge before securing a permit are lost and cannot be included in the permit.⁶⁰

Another Water Code provision relates to permits for reuse of effluent without reference to its source.⁶¹ Yet another provision says that effluent derived from surface water is surplus water available for appropriation by others.⁶² These conflicting provisions have raised more questions than they have answered. Is surface water-based effluent discharged to a river subject to new appropriations, or is it subject to a different regulatory system? Is an application to reuse historic levels of surface water-based effluent to be treated differently than an application to reuse an increase in effluent over

⁵⁵ See the discussion above of the *Guitar Holding Company* case.

⁵⁶ *Water for Texas 2007*, pp. 269-70.

⁵⁷ TEX. WATER CODE §11.046(c).

⁵⁸ The authorization process and substantive rules are found in 30 TAC Chapter 210.

⁵⁹ TEX. WATER CODE §11.042(b). Prior to the enactment of this provision, the City of San Marcos applied to the state for authorization to divert river flows in an amount equivalent to its groundwater-based effluent discharge, claiming that the water was privately owned and did not lose that characteristic upon discharge. The Court of Appeals disagreed (*City of San Marcos v. Texas Comm'n on Env't'l Qual.*, 128 S.W. 3d 264 (Tex. App. – Austin 2004, pet. denied)) and suggested that the city submit an application under this new statute.

⁶⁰ TEX. WATER CODE §11.042(b).

⁶¹ TEX. WATER CODE §11.042(c).

⁶² TEX. WATER CODE §11.046(c).

historic levels? To what extent should reuse permits be subject to conditions to protect environmental flows?⁶³ The uncertainties raised by these questions will likely need to be answered, either in the administrative context of reuse permit applications, through litigation, or in the legislature, before significant investments in indirect reuse projects are made.

The legislature *opens the door* on the topic of new reservoirs

Senate Bill 3 in 2007 included provisions intended to encourage the development of certain new reservoirs. Among these are the proposed Marvin Nichols and Fastrill reservoirs in northeast Texas, intended to provide supply to the Dallas-Fort Worth area. The bill provided that 20% of the firm yield would need to be dedicated to the needs of the respective basins, and that the entire cost of the projects would be borne by the Dallas-Fort Worth interests until such time as the in-basin users actually take delivery of water from the projects.

Yet the implementation of new reservoir projects is far from certain. Strong opposition premised on the protection of private property rights, avoidance of damage to the environment and local economies, and the availability of alternative supplies will complicate the prospects for permitting and implementation of any such project.⁶⁴ The Fastrill Reservoir project is mired in litigation filed by the City of Dallas and the TWDB against the U.S. Fish and Wildlife Service after the FWS accepted a small donated easement in the reservoir's footprint with the purported intent to establish a wildlife refuge, effectively undermining the project.⁶⁵

The legislature *encourages* desalination

Most people think of seawater when they think of desalination. The abundance of seawater and its proximity to some population centers makes it attractive. But treatment costs are high and environmental effects from brine disposal are uncertain.⁶⁶

Treatment of brackish groundwater is a potential opportunity for use of desalination technology. Brackish groundwater is found throughout the state, and generally it is much easier and cheaper to treat than seawater. Supplies are available, treatment technology is available and proven, and project development is relatively straightforward. On the other hand, treatment involves high energy needs – a definite challenge in times of increasing energy costs. And concentrate disposal poses cost and permitting issues. El Paso Water

⁶³ These questions are examined in a 2006 article, "Texas Water Rights and Wastewater Reuse," prepared by the Reuse Committee of the Texas Water Conservation Association.

⁶⁴ For example, see the "Fact Sheet" for the Stop Marvin Nichols Coalition at <http://www.stopmarvinnichols.com/Documents/marvin-nichols-fact-sheet.pdf>

⁶⁵ *City of Dallas v. Hall*, Case No. 3:07-CV-0060-P, pending in the U.S. District Court, Northern District of Texas.

⁶⁶ A good overview of seawater desalination issues - Ken Ramirez and Patrick Lee, "Desalination: Opportunities and Constraints," Texas Bar Journal, March, 2004; available online: <http://www.texasbar.com/PrinterTemplate.cfm?Section=Home&Template=/ContentManagement/ContentDisplay.cfm&ContentID=6518>

Utilities is operating a brackish water desalination project,⁶⁷ and several pilot projects for brackish groundwater are under way.⁶⁸

The legislature in 2005 appropriated funding to TWDB for pilot desalination projects. Two seawater desalination pilot projects (Brownsville Public Utilities Board and Laguna Madre Water District) and three brackish groundwater desalination demonstration projects (City of Kenedy, City of San Angelo, and North Cameron Regional Water Supply Corporation) were funded under this appropriation, and the pilot project studies are currently in progress. In September of 2006, the TWDB approved additional demonstration projects for the San Antonio Water System, Sandy Land Underground Water Conservation District, El Paso Water Utilities, and the University of Texas at Austin.

The 2007 State Water Plan anticipates that in 2060, 320,000 a-f/yr of new water supplies will be provided by desalination – 56% involving brackish water and 44% involving seawater.

Funding for new water supplies – What role should the state have?

By statute, surface water in streams and rivers is owned by the state.⁶⁹ A right to divert and use state surface water is a right of use that does not change this ownership. A right can be cancelled for non-use.⁷⁰ Yet most surface water rights are regarded as property rights that have value to the holder independent of state ownership.⁷¹ And as previously noted, the state now charges a token fee for the use of state water.

At the same time, the state water plan identifies the enormous financial resources that will be needed to develop new water supplies needed in the state. What should the role of the state be in providing the needed resources, and what should the source of state revenue be to fulfill that role?

Senate Bill 2 as filed in 2001 proposed a new state Water Infrastructure Fund that would have been fed by the following revenues:

- An annual \$1 per resident water fee to be paid by counties
- An expansion of the state sales tax to include water and wastewater services
- One-half of export fees charged by groundwater districts
- An annual fee on water rights in state-owned surface water

As passed, however, SB 2 established the WIF, but did not dedicate any revenue sources to the fund.

SB 2 also created the Texas Water Advisory Council and charged the Council with identifying “impediments to the implementation of recommended strategies contained in regional water plans throughout the state”. The Council found as one impediment that

⁶⁷ A description of the El Paso project is online at http://www.epwu.org/water/desal_info.html.

⁶⁸ The projects are described online at <http://www.twdb.state.tx.us/iwt/desal/facts/onepagebrack.html>.

⁶⁹ TEX. WATER CODE §11.021(a).

⁷⁰ TEX. WATER CODE §11.172.; 30 TAC Chapter 297.

⁷¹ Just as an example, the Lower Colorado River Authority paid \$75 million in 1998 for the transfer of a 133,000 acre-foot senior water right.

“[c]urrent levels of federal, state, and local dollars are not sufficient to address the funding needs identified and recommended for strategies and projects in the 2002 State Water Plan”.⁷²

Senate Bill 3 in 2007 established the Joint Committee on State Water Funding. This Committee of legislators held its first meeting in Dallas on May 14th, and will likely make recommendations to the legislature by year’s end.

Conclusion

Those of us tasked with meeting the water needs of a growing state, primarily in urban areas, face significant challenges to secure the ongoing vitality of our state. The state, together with stakeholders in regional planning groups and groundwater management areas across the state, are continuing to pursue the innovative processes for future water supply planning initiated in Senate Bill 1 (1997), Senate Bill 2 (2001), House Bill 1763 (2005), and Senate Bill 3/House Bill 3 (2007).

The practical challenges of identifying needs and choosing and implementing strategies to meet those needs are exacerbated by the fact that many of our basic legal principles for water remain unsettled, our state policies on water supply development have not been consistent, and our markets and transfer mechanisms are not yet stable and predictable. These complications result in a much greater challenge for Texas cities in meeting future water needs.

Undoubtedly, some of these issues will have to be resolved through litigation. But if all of these complicating factors are left to the courts to resolve, implementation of strategies for new water supplies will likely face significant delays. Definitive guidance from the legislature could resolve many of these issues in a much more timely manner.

⁷² Texas Water Advisory Council, 2004 Report, p. 5; online at http://www.senate.state.tx.us/75r/Senate/commit/c580/downloads/rpt_twac_jan2005.pdf.

Appendix A

Highlights of *Water for Texas 2007*

Adapted from H₂O, TAWWA Newsletter, November/December, 2006

- The population of Texas is projected to increase from 21 million in 2000 to 46 million in 2060.
- Over the next 60 years, the demand for all uses of water in Texas is projected to increase by 27 percent from almost 17 million acre-feet of water in 2000 to a projected demand of 21.6 million acre-feet in 2060.
- Water supplies – the amount of water that can be produced with current permits, current contracts, and existing infrastructure during drought – are projected to decrease about 18 percent, from about 17.9 million acre-feet in 2010 to about 14.6 million acre-feet in 2060.
- Texas does not have enough water today to meet the demand for water in the future during times of drought. To meet the needs or shortages, the state is projected to need an additional 3.7 million acre-feet of water in 2010, increasing to 8.8 million acre-feet in 2060.
- The 16 planning groups from across the state identified about 4,500 water management strategies to meet the identified water supply needs through 2060.
- The estimated capital costs to implement water management strategies to meet the identified needs are approximately \$30.7 billion.
- If the identified water management strategies are not implemented, projected water shortages during drought could cost businesses and workers in the state approximately \$9.1 billion in 2010, increasing to roughly \$98.4 billion in 2060.
- If the identified water management strategies are not implemented, about 45% of the state's projected population will not have enough water during drought conditions to meet their needs by 2010, increasing to 85% by 2060.
- The plan includes increased utilization of water conservation strategies that total over 2.0 million acre-feet by 2060 or 23 percent of the total water supply needs in the state.
- However, water conservation alone cannot meet the total needs identified in the 2007 State Water Plan. Water reuse, desalination, additional groundwater use, and fourteen new major and two minor reservoirs are recommended.

Appendix B

Comparison of Estimated Financial Costs for Water Supply Strategies (per acre-foot per year, in 2007 dollars)

From *Water for Texas 2007*, Chapter 10

Strategy	Estimated statewide average cost
Municipal water conservation	\$234 ¹
Agricultural irrigation conservation	\$77 ²
New and existing surface water	\$254
Groundwater	\$260
Reuse water	\$248
Desalination	\$1,079 – Seawater \$691 – Brackish groundwater
Conjunctive use	\$749 – Region G \$1,244 (Regions K and L) ³

¹ Capital costs are minimal; this figure represents the average operating costs for conservation programs that save one acre-foot of water per year.

² While this figure seems low, the Water Plan notes that agricultural economics and the lack of practical mechanisms for transfer of conserved water will present challenges for implementation.

³ This is the SAWS/LCRA project that involves two planning regions.