THE METROPLEX IS AT THE WATER'S EDGE:
LET THE WARS BEGIN

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I. THE MORE THINGS CHANGE, THE MORE THINGS CHANGE

Texas water law has changed dramatically over the past 11 years, culminating most recently with new statutes and regulations of state-wide application that will become effective September 1, 2009. We are now beginning to experience the full effects of the changes begun in 1997, which has seemingly only accelerated further regulation and faster change. This increase in regulation has generated a simultaneous expansion of due process rights available to landowners and other water users, allowing them more opportunities to participate in the water regulatory process.

The combined effect of increased regulation, greater recognition of more substantive private rights, and the increase in due process rights to protect those substantive rights, impacts more and more of our clients, often without them knowing it, to their peril. A basic understanding of Texas water law is no longer a luxury. Because, statistically speaking, one out of every one human requires water for survival, Texas real estate professionals need to know how clients are affected by Texas' water laws, whether they be water users or water sources. To that end Texas real estate professionals must have a basic working knowledge of the regulation of water rights and usage, including the significant amount of planning involved.

Metroplex-area real estate professionals (specifically, lawyers in Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hood, Johnson, Montague, Parker, Tarrant and Wise Counties) are facing rapid change in the near future because the Texas Commission on Environmental Quality (TCEQ) has designated this area a "Priority Groundwater Management Area" (PGMA, pronounced "pig-ma"). This has spawned the creation of several groundwater conservation districts (GCDs) in this area. The effect of this designation is detailed later in this paper.

This paper is intended to help Metroplex area real estate professionals who are not familiar with Texas water laws and regulations spot issues and provide a general framework within which to serve your clients. To that end, this paper will explain briefly both the water availability and use planning process, and the retail water provider regulatory scheme, with particular emphasis on the rights landowners (i.e. clients) have to participate in all of the various planning and regulatory processes.

II. WHY TEXAS IS CONCERNED

The official population growth projections for Texas, through 2060, are attached as **Exhibit 1.** These are the official numbers adopted by the Texas Water Development Board (TWDB) used in all Texas water planning. **Exhibit 2** shows growth rates by county, and it shows that the largest concentration of high growth is in and around the Dallas-Fort Worth metropolitan statistical area (the Metroplex).

Exhibit 3 is a table of projected state water demands, again through 2060, adopted by the TWDB. **Exhibit 4** shows the projected changes in types of water demand over the next 50 years. There are two sources of water generally available to meet this demand, surface water and groundwater.

Reservoirs provide much of the surface water supply. **Exhibit 5** (discussed in more detail below) shows that Texas expects to add only 8 new reservoirs from now until 2050. However, Texas' major reservoirs are losing approximately 0.27% of the total reservoir capacity per year, which is more than the capacity expected to be gained with the construction of new major reservoirs.[1]

In the meantime, the quantity of available groundwater is also shrinking. **Exhibit 7** is a graph showing the predicted decline in groundwater resources from 2010 through 1060. **Exhibit 8** shows declines in water levels in the major aquifers in Texas.

The point of these exhibits and other information is that additional water supplies must be found, or significant conservation strategies employed, in order to support the projected population growth and to address climate change. In fact, even our current population seems to be using, on a net basis per year, more water than the state is receiving, and this is certainly true for the Metroplex.

State trends are more pronounced in the Metroplex area. Its population is expected to nearly triple. Only one small new reservoir is within 20 years of existence, maybe even 30 years, and the volume of groundwater is already declining with the current population and other development. Notice on Exhibit 8 the Trinity aquifer, which is the primary source of groundwater for the Metroplex, is predicted to experience significant decline, from 500 to more than 800 feet.

Basically, Texas in general, but the Metroplex in particular, is in between a rock and a hard place when it

[1] Water for Texas 2007 (TWDB), p. 138

comes to meeting current and future demand, since both demand is increasing and supplies are decreasing. If you are of the opinion that rains will solve this problem for us, please feel free to skip the rest of this paper and take up Ark Design and Construction 101, in which case the author commends to you Genesis 6:14-21 (i.e. Noah and the ark) as your point of commencement. We are beyond the ability of the ground to hold that much water.

A. "THE" Drought

The worst drought in recorded Texas history began in 1950 and lasted 7 years.[2] It was a drought of record.[3] By the end of 1956, 244 of Texas' 254 counties were classified as disaster areas. Natural springs, creeks and rivers ran dry. Crops withered. Reservoir capacities sank to critical levels. Some cities exhausted their water supplies completely, and had to have their water hauled in by truck. In response to THE drought, Texas created the TWDB, which published its first water plan in 1961. Texas has since embarked on ever more sophisticated planning, and, more recently, made water use subject to water planning, as detailed more specifically in this paper.

Today droughts require affected water suppliers to institute water use restrictions. Lack of rain also causes the imposition of outdoor burn bans. These drought management plans do not just "happen"; they are the result of very detailed planning. Droughts are studied, measured and predicted, and water conservation requirements are keyed to these factors.

Water use is subordinate to water planning. Stated differently, water planning controls water use. This is a critical concept to understand. A client's inability to obtain a particular volume of water supply in the future will most likely be due to water planning. A general understanding of Texas water supplies and the modern Texas water planning system is therefore necessary to understand and deal with water use issues on our clients' demand side of the equation.

B. The Modern Era of Planning

The Texas Legislature realizes that water planning must be continuous to respond to the various changes that constantly affect Texas water supply and demand, changes such as population increases, climate and other environmental changes, and socioeconomic and demographic conditions. Accordingly, Texas has developed and implemented a unique water use planning process that, what with this being Texas, focuses on local control.

1. Texas' Water Resources

In Texas, approximately 40% of our water consumption is supplied by reservoirs. Reservoirs are relatively easy to define and certainly obvious to see. They contain "surface water" which is owned by the state.[4] Attached as **Exhibit 5** is a graph showing the number of reservoirs in the state currently, and projected through 2050, based on regional water plans which will be discussed in detail below. Notice from this graph that the number of expected reservoirs is only expected to increase by 8 from 2000 to 2050. **Exhibit 6** delineates the 35 year time line required to construct the Richland-Chambers Reservoir. This time line provides some clue as to why 50 years is an appropriate time period for planning water infrastructure. State predictions and models of supply and demand must have such long planning horizons because many water infrastructure facilities take as long as 35 to 50 years to design and construct.

Statewide, groundwater provides approximately 60% of our consumable water resource. Groundwater is defined as "water percolating below the surface of the earth."[5] Groundwater resources are subject to depletion if the groundwater is used faster than it is replenished. Overuse is termed overdrafting, and replenishing of an aquifer is termed recharge. Water pumps overdrafting an aquifer lower the water table as they pump water to the surface for use. If the water table dips below the bed of a nearby hydrologically related river, stream or creek, that waterway will typically run dry.

The key to recharging the ground and waterways

[2] However, Malcolm K. Cleaveland, Professor of Geography, University of Arkansas has proposed, based on tree ring analysis research, that several even more severe droughts have occurred in the Edwards Plateau and South Central Texas regions during his 436 year study period. *See* Cleaveland, M.K., 2006. *Extended Chronology of Drought in the San Antonio Area*. Fayetteville, AR. University of Arkansas: Tree-Ring Laboratory, Geosciences Department. 25 p. His point is that Texas should not make its planning decisions based on the principle that the 1950 drought was the "worst case scenario," meaning things may be worse than we think they are.

[3] "Drought of record" is defined in 31 Tex. Admin. Code § 357.2(2) as "the period of time when natural hydrological conditions provide the least amount of water supply". Theoretically, therefore, there could be a worse drought than the one experienced by Texas in the 1950s.

[4] Texas Water Code § 11.021

[5] Texas Water Code § 36.001(5)

with water is rain. Surface runoff of rain is collected into waterways, which fill our reservoirs. Other rain water infiltrates the ground, to become groundwater. In either event, as you can see, Texas is heavily dependent on consistent rain as its source of consumable water.

2. State Entities: TWDB and TCEQ

Texas primarily utilizes two state agencies to plan, direct and manage its water resources. As you will see, there is occasional overlap in jurisdiction, but generally they are concerned with different areas of water resources. A general rule of thumb is this: if your client's concern has to do with planning water infrastructure to meet estimated and desired water needs, including the estimation of those needs and water conservation requirements, start with the TWDB. For everything else, such as water quality, permits to use water, water utility performance and regulation, utility rates, and the inability to obtain water from a supplier, look to the TCEQ.

The TWDB is established by Texas Water Code § 6.011 and governed by Chapter 6 of the Texas Water Code. It is primarily a planning and data collection entity, but it also administers the state's various water assistance and financing programs.[6]

The TCEQ is primarily concerned with delivery of water resources, including the regulation of water utilities, i.e the implementation and execution of the plan developed by the TWDB. It is established by Texas Water Code § 5.012 and governed by Texas Water Code Chapter 5. If state water or a water permit is involved, most likely it comes from the TCEQ and the TCEQ regulates in some way the holder of the water permit.

3. Regional Entities: RWPGs

As later explained, the TWDB has divided the state into water planning regions. **Exhibit 9** shows the current Regional Water Planning Areas. Each region is governed by a group of individuals (referred to as a Regional Water Planning Group or RWPG). The TWDB designated the initial members of each Regional Water Planning Group, which in turn designated additional persons from 11 interest groups (specifically the public, counties, municipalities, industries, agricultural interests, environmental interests, small businesses, electric generating utilities, river authorities, water districts, and water utilities) to also serve on the Regional Water Planning Groups.

[6]Texas Water Code § 6.012

The role of these Regional Water Planning Groups has changed somewhat through the years. However, generally, RWPGs hire consultants to assist with developing the engineering, socioeconomic, hydrological, environmental, legal and institutional components of a plan for their region. These plans explain, in oftentimes painstaking detail, how the region will meet its projected population increases with its various water supplies and the use of water management and conservation strategies.

4. Local Groundwater Regulators: GCDs

Groundwater moves in underground rivers, or aquifers. Attached as **Exhibit 10** is a drawing of the major aquifers in Texas. Texas law recognizes that a landowner owns the groundwater beneath the surface estate.[7] This is referred to as the doctrine of absolute ownership of groundwater, and was recently upheld.[8] Historically, the landowner has the right to capture the water under the surface, and upon capturing it, the landowner owns the captured groundwater. Landowners may then use the water themselves, convey the water to another user, or even bottle the water and sell the bottled water, with few meaningful restrictions.

In the *City of Del Rio* case, the defendant trust sold a 15 acre tract of land to the City, but reserved all water rights associated with the tract, and further prohibited the City from using any portion of the tract for exploring, drilling or producing any water. Three years after purchasing the tract, the City realized it needed to augment its municipal drinking water supply, so it decided to drill a water well on this tract. It was completed at a cost of about $850,000. Upon discovery of the water well, the trust demanded that the City cease activities on the 15 acres, and when the City refused, the trust brought this lawsuit.

The court held that the "absolute ownership" doctrine refers to the ownership of the actual corpus of water. The City had argued that the doctrine referred only to the right of the surface estate owner to acquire possession of the groundwater. If the owner never pumped the water to the surface, whereupon it would possess the water, then the owner never acquired ownership of the groundwater. The court expressly rejected this theory.

[7]*Houston and Texas Central Railroad Company v. East*, 81 S.W. 279 (Tex. 1904)

[8]*City of Del Rio v. Clayton Sam Colt Hamilton Trust*, __ S.W.3d __ (Tex. App.-San Antonio 2008); 2008 TXCA4 04-06-00782 - 022708

A corollary of the absolute ownership doctrine is the "Rule of Capture." It is important to understand that the Rule of Capture does not give an operator the right to drain his neighbor's tract but merely precludes liability for doing do.[9] The Rule of Capture defense was recently affirmed in the so-called *Ozarka* case[10]. In the late 1980s, the Great Springs Waters of America drilled a very large water well in Henderson County, Texas, and began pumping 90,000 gallons of water per day, 7 days a week. It was bottled and sold in retail stores under the "Ozarka" label, a company owned by Nestle Foods. Neighboring wells dried up, and the owners sued seeking to stop or at least restrict in some manner the continued pumping. The courts refused to hold Great Springs Waters of America liable based on the rule of capture.

The Legislature has begun to rein in the doctrine of absolute ownership of groundwater, which is arguably the most controversial water law policy development of our day. The manner by which this doctrine is being modified is through the rules and regulations of GCDs, which restrict the volume of water that may be produced, and may restrict the ability to drill a water well. The hot issue is whether a restriction is a prohibited, unconstitutional taking.

GCDs are authorized by the Texas Constitution[11] and created either by statute or by petition filed with and approved by the TCEQ.[12] They are "the state's preferred method of groundwater management through rules developed, adopted, and promulgated by a district in accordance with the provisions of [Water Code Chapter 36]."[13]

GCDs are to conserve, preserve, protect, and recharge groundwater, prevent groundwater waste, and control subsidence caused by groundwater withdrawal.[14] Generally, GCDs must require a permit for the drilling, equipping, operating, or completing of wells[15] or for substantially altering the size of wells or well pumps.[16] Additional GCD rules may require, among other things:

permits for wells;
well construction standards;
plugging standards;
production limits; and/or
well spacing restrictions.

Attached as **Exhibit 11** are the currently-existing GCDs in Texas. As shown, there are 91 GCDs, with 4 additional GCDs in the process of being formed.

GCDs are quirky entities, in that there is little uniformity among them. They are special law districts, meaning they are created by specific legislation that establishes their powers and duties. The House Bill or Senate Bill creating them is called their "enabling legislation" or "enabling act." Some enabling acts are very sparse, while others cover a broad variety of powers and duties, again with no two exactly the same. Texas Water Code Chapter 36 fills in the gaps for all GCDs. However, practitioners must always remember that when dealing with a GCD, one must review its enabling legislation and Texas Water Code Chapter 36 as well as its rules.

5. Reservoir (Surface Water) Regulators: The TCEQ

All surface water is owned by the state of Texas.[17] Reservoirs are created by collecting surface water, often by constructing a dam across a river (which is surface water). This section will focus on these types of reservoirs since there are four such reservoirs planned for the Metroplex in the 2007 State Water Plan (the creation of one of which, proposed Lake Fastrill, is in litigation currently on appeal to the U. S. Supreme Court), and these resources supply the majority of water to the Metroplex.

As a general rule, anyone who wants to use surface water in Texas must first obtain permission from the State. This is practically accomplished through a permitting process administered by the TCEQ. The document, when issued, is called a "water right", and

[9] *Id.*

[10] *Sipriano v. Great Springs Waters of Am., Inc.*, 1 S.W.3d 75 (Tex. 1991).

[11] Tex. Const. Section 59, Art. XVI

[12] Texas Water Code §§ 36.011, 36.013

[13] Texas Water Code § 36.0015

[14] Id.

[15] Interestingly, "water well" is not defined by the Texas Water Code. The Water Well Driller Board's definition of "water well" includes some wells that do not produce groundwater. *See* 16 Tex. Admin. Code § 76.10

[16] Texas Water Code § 36.113(a)

[17] Texas Water Code § 11.021

documented water rights are generally referred to as "appropriated water rights." The appropriated water right is perpetual for most if not all large reservoirs. A perpetual appropriated water right to impound water by storing it in a reservoir above a dam is called an impoundment right.

Perpetual appropriated impoundment water rights have the following key features:

- they have an assigned priority date that determines the rights of the holder in relation to other water rights;
- whenever there is less water than is needed to satisfy all water rights in a basin, each appropriated water right is subordinate to domestic and livestock users who also have rights to this water;
- they specify the volume of water that the rights holder may take or use each year;
- they specify the location of the dam, the capacity of the reservoir, and any special conditions placed on the right (e.g., "may impound only the portion of the streamflow that exceeds 100 cubic feet per second");
- they do not guarantee that this water will always be available.

Permits may be issued only if water is available to satisfy other water rights and still meet the new demand.[18] The TCEQ uses computer modeling and historical records to determine water availability when making the decision to issue one of these permits.

Because reservoirs have an environmental impact, reservoir projects must comply with many federal and state environmental laws before they can be built. There are other federal issues involved in the construction of new reservoirs as well (e.g., permitting by the Army Corps of Engineers), which are beyond the scope of this paper.

Rights to water in a reservoir are allocated among various water rights holders with the same basin based on the relative priority of their appropriation. Water rights are generally "first in time, first in right." A senior water rights holder downstream can require a junior right upstream to release a sufficient volume of water to satisfy the senior water right holder. A junior water rights holder downstream has no ability to force an upstream senior rights holder to release any water to the junior rights holder. **Exhibit 12** is a schematic illustrating and explaining how to determine the priorities of various water rights holders in a basin.

Most of the state's existing surface water supply, which is almost 6.3 million acre-feet, is a direct result of the state's major and minor reservoirs. Texas has 196 major reservoirs, 175 of which have a water supply, irrigation, or industrial water use. Few viable sites remain for new reservoirs. The amount of water permitted through permanent consumptive surface water permits is estimated to be 20 million acre-feet per year. In 2010, it is projected that there will only be 9 million acre-feet per year of existing surface water supply in Texas that is both physically and legally available. However, aging reservoirs are filling with sediment. Existing surface water supplies are projected to decrease to 8.4 million acre-feet by 2060, partly due to sediment accumulation in reservoirs.

Sometimes more than one water supplier will contract for some of the yield from a reservoir. For example, the proposed Marvin Nichols Reservoir is projected to produce a yield of 495,300 acre-feet of water per year for Region C, but it is divided as follows:

- 163,300 acre-feet per year to North Texas Municipal Water District;
- 156,000 acre-feet per year to Tarrant Regional Water District;
- 112,000 acre-feet per year to Dallas Water Utilities;
- 25,000 acre-feet per year to Irving; and
- 39,000 acre-feet per year to meet other Region C needs.

These wholesale water suppliers then provide water to their customers. For example, Dallas Water Utilities provides water to the City of Dallas and several of its suburbs. The retail water suppliers then provide the water supply to end users (residences, businesses, and such). Regardless of the actual use by the consumer, this type of water supply is classified as "municipal" water use.

[18] Texas Water Code §11.134(b)(2)

III. A BRIEF HISTORY OF THE WATER PLANNING PROCESS

The modern era of water planning began with legislation passed in 1997, and such planning has only increased in importance through today, culminating most recently with the enactment of House Bill 1763 in 2005 adopted by the 79th Legislature. As of 2008, Texas water planning is the result of the amalgamation of six legislative enactments, which will now be quickly reviewed.

A. In the Beginning: Senate Bill 1 (75th Legislature, Regular Session, 1997)

Texas water law changed substantially in 1997 with the passage of Senate Bill 1 in the 75th Legislature, a 196 page bill. If you ever hear a Texas water rights lawyer mention or discuss "SB 1", which is almost always done in reverential tones, this is their reference. This bill ushered in the "modern era" of Texas state water regulation. It began a continual planning process cycle. Texas has gone through two of these planning cycles and is now well into the third. This experience has spawned significant additional regulation and even more planning requirements.

SB 1 also began the process of marrying the available science of water management with operations and policies of the regulatory entities and water suppliers. Additionally, it began the trend of introducing more objective standards into water planning and water use. Furthermore, SB 1 began the trend towards greater centralization of water resource management. All of these trends are still continuing today.

1. The Texas Water Development Board Assumes Preeminence

SB 1 designated the TWBD as the lead state agency for developing a state water plan to determine state water resources and needs, and coordinating a state water plan to meet those predicted needs. In February of 1998, after extensive review and public comment, the TWDB adopted state and regional water planning rules. Practically, these planning authorities and powers were moved from the TCEQ. As Texas moves closer to the day when water planning determines the provision and use of water (January, 2012), the agency responsible for water planning will practically assume more and more preeminence over the agency concerned more with the provision of water. The TWDB's position in the development of Texas water law is a trend that is continuing to strengthen.

2. Regional Water Planning Groups (RWPGs)

SB 1 ramped up regional water planning by requiring the TWDB to designate areas for which regional water plans should be developed. Each regional water planning area is managed by a Regional Water Planning Group (RWPG). SB 1 gave the TWDB the authority to create these RWPGs for each regional water planning area (**Exhibit 9**). SB 1 then directed these RWPGs to prepare, adopt and submit to the TWDB regional water plans for their region, describing how local entities in the region intend to address future water supply needs for the next 50 years. The plans include means to conserve water supplies, meet future water supply needs, and respond to future droughts. They address engineering, socioeconomic, hydrological, environmental, legal and institutional issues. SB 1 requires them to be consistent with the TWDB guidance rules. Regional groups were required to consider the information in GCD management plans, but could use their own, different water supply and demand estimates if they so chose. Since the state water plan was based on the regional plans, this meant that a state plan could be inconsistent with one or more GCD plans. As a result, this role changed dramatically in 2006, as discussed below.

SB 1 also specified the contents of GCD management plans[19], and provided significant motivation for GCDs to timely complete their management plans by providing a specific list of disciplinary measures for failure, including the "death penalty", dissolution of the GCD by the TCEQ.[20]

3. The Planning Cycle: State Water Plans

SB 1 requires the TWDB to formulate a "state water plan" beginning in January of 2002, and every five years thereafter. These State Water Plans (and their regional components) have 50 year planning horizons.[21] SB 1 also requires the RWPGs to draft revised and updated regional water plans every 5 years (i.e. January of 2001, January of 2006, January of 2011, and so on). During the first planning cycle, the eligible plan development costs for the regional water plans totaled

[19] Codified at Texas Water Code § 36.1071 and detailed in 31 Tex. Admin. Code § 356.2

[20] Texas Water Code § 36.303

[21] Note, however, that Priority Groundwater Management Areas, discussed in Section III.B.3. below, use a shorter 25 year period scope of review. To date, the TCEQ has established 7 Priority Groundwater Management Areas (Source: TCEQ).

$20,187,508, funded by legislative appropriations.[22] The State Water Plan is produced one year after completion of the regional water plans.

4. The 2002 State Water Plan: Why You Care

Based on the approved RWPG regional water plans, in January, 2002, the TWDB prepared, adopted and submitted a state water plan, entitled "State Water Plan, Water for Texas-2002", a copy of which is available for download at:

http://www.twdb.state.tx.us/publications/reports/State_Water_Plan/2002/FinalWaterPlan2002.asp

(the "2002 State Water Plan"). From and after January 5, 2002, TWDB financial assistance for water supply projects is provided only to projects that meet identified needs in a manner that is consistent with the approved regional water plans.[23] Water projects are now also subject and subordinate to the various water planning efforts.

The 2002 State Water Plan also proposed future water policy recommendations for consideration by the Legislature, which brought about additional statutes and regulations. By the time the TWDB delivered the 2002 State Water Plan, the RWPGs had already begun the next (second) round of regional water planning. The more things change, the more things change.

5. The 2007 State Water Plan

The RWPGs filed their second round of planning reports with the TWDB in January of 2006.[24] On November 14, 2006, the TWDB adopted the 2007 state water plan, entitled "Water for Texas-2007", a copy of which is available for download at:

http://www.twdb.state.tx.us/wrpi/swp/swp.htm

This completed the second round of SB 1 planning. The third round of planning, being conducted now, is materially different because it was affected by subsequent legislation, discussed below.

[22]Source: TWDB

[23]Texas Water Code § 16.053(j)

[24]The South Central Texas RWPG failed to adopt a plan by the required January 5, 2006, deadline, and thus had no official plan. However, House Bill 37756 (80th Leg. R. S., 2007) gave the TWDB specific authority to accept this plan provided Region L made certain specified amendments.

B. The Same, Only Different: Senate Bill 2 (77th Legislature, Regular Session, 2001)

Senate Bill 2 (77th Legislature, R. S. 2001) was a 244 page omnibus water resources bill. It did not change the planning cycle, but it added new planning elements, expanded regional planning to cover the entire state, and switched the priority of regional and local plans in determining the state plan.

1. Additional TWDB Duties

A Groundwater Management Area (GMA) is a geographic area suitable for the management of groundwater resources.[25] SB 2 moved the responsibility of creating GMAs from the TCEQ to the TWDB and directed the TWDB to develop GMAs to cover all major and minor aquifers in the state. Accordingly, in November of 2002, the TWDB divided the state into 16 regional groundwater management areas (the current GMAs), and determined the boundaries for each of those areas (see **Exhibit 9**),[26] based on aquifer and other hydrological boundaries and with some consideration of political boundaries.

Note that GMAs are different than Regional Water Planning Areas. GMAs are defined by a number (as in, "GMA No. 1, 2, 3, etc.), whereas Regional Water Planning Areas are defined by alphabetic letters or names (such as "Panhandle", "Region C" and "Brazos G"). GMAs are more focused on particular common water resources. Regional Water Planning Areas are administered by a RWPG. There is no comparable administrator of a GMA. Management of a GMA is accomplished, practically, by the collective planning of the GCDs situated within the respective GMA. (Note that Exhibit 11 shows GCDs in the context of Regional Water Planning Areas.)

2. Priority Groundwater Management Areas

Priority Groundwater Management Areas (PGMAs, pronounced "pig-ma") are areas of the state that are experiencing or that are expected to experience,

[25]Texas Water Code § 35.002(11)

[26]Groundwater management areas have existed since at least 1949 and at different times have been called "underground water reservoirs", "management areas", and "underground water management areas" depending on the Legislature's mood. Prior to SB 2, the TCEQ and predecessor agencies had established 19 groundwater reservoirs and/or groundwater management areas. These boundaries were dissolved and relegated to water law trivia upon the TWDB's 2002 adoption of GMAs covering the entire state.

within the immediately following 25-year period, critical groundwater problems, including shortages of surface water or groundwater, land subsidence resulting from groundwater withdrawal, and contamination of groundwater supplies.[27] As a general rule, one does not want to live in a PGMA. SB 2 directed the TCEQ to complete its initial designation of PGMAs across all major and minor aquifers of the state for all areas that meet the statutory qualification. To date, the TCEQ has created 6 PGMAs, and these are shown on **Exhibit 14**.[28] SB 2 also requires annual review of the need for additional designations. The public may participate in the designation process.[29]

3. Groundwater Availability Models (GAMs)

SB 2 required the TWDB to develop GAMs for all major aquifers in Texas by October of 2004. These major aquifers are shown on **Exhibit 10**. A GAM is an estimate, based on various scientific measurements and formulas, that predicts how much capacity a natural resource has to give and how long flows can be maintained when usage and drought are factored in.[30] GAMs require information on recharge (how quickly a groundwater resource is replenished, such as with rain), aquifer geometry (depth and thickness) and other aquifer properties (transmissivity, hydraulic conductivity, storativity, and water levels). Planning groups may use aquifer geometry and property information to calculate water in storage and drawdown around individual wells. Modeling techniques continue to become more accurate as the science of GAMs improves.

GAMs are so important for this one reason: SB 2 requires GCDs and RWPGs to use GAMs in developing their management plans.[31] They assumed even greater importance with the passage of HB 1763, as will be discussed below.

4. Joint Planning

Prior to passage of SB 2, the primary purpose of Groundwater Management Areas was to foster the creation of GCDs. SB 2 changed the primary role of Groundwater Management Areas to joint planning. First, it required GCDs within the same Groundwater Management Area to share their groundwater management plans. Second, it provided the option for GCDs in the same Groundwater Management Area to engage in joint planning if one of the area GCDs called for it. However, the TWDB reports that to its knowledge no GCD ever called for joint planning.[32]

C. More Details of "Same": House Bill 1763[33] (79th Legislature, Regular Session, 2006)

HB 1763 promoted water resource planning to nearly cult status. It required more of the local level of water entities to conform their permitted water use to the water plans, and elevated their use of and consistency with GAMs from required consideration to required conformity.

1. Conflict Resolution

By 2006, Texas began experiencing conflicts between RWPGs and GCDs, and other quasi-government players in the water planning and use arena, and so HB 1763 also established priorities among the planning groups to settle certain conflicts, while also adding conflict resolution processes to resolve those that remained. For example, new Texas Water Code § 36.1072(g) put in place a process by which a conflict is resolved between a GCD and a RWPG.

2. When the Legislature says "Bottom Up", They Mean It

Prior to HB 1763, Texas had already developed a water planning process heavily reliant on and influenced by the local GCDs. HB 1763 elevated GCDs to the top of the priority list, by requiring RWPG regional water plans to be consistent with GCD management plans. RWPGs lost the ability to merely

[27] Texas Water Code § 35.007(a)

[28] Source: TCEQ. Recently, TCEQ staff has recommended the creation of two additional PGMAs in the two study areas shown on Exhibit 14.

[29] Texas Water Code § 35.008

[30] SB 2 was not, however, the initial foray into the completion and use of GAMs. A GAM was first developed for the Hill Country and its success prompted the 76th Legislature to approve initial funding of a statewide GAM effort with passage of Senate Bill 1 (not the "holy grail SB 1").

[31] Texas Water Code § 36.1071

[32] Mace, footnote 13

[33] You may notice that this is the only water bill in the triumvirate of "major" water legislation that is a "house" bill as opposed to a "senate" bill. HB 1763 began its legislative life focusing on GCDs. Senate Bill 3 introduced in the 79th Legislature was "the" water bill of that regular session; however, it failed to pass the House, and once its demise was imminent, various parts and pieces of it were grafted by amendment onto House Bill 1763, expanding this bill from 16 pages as filed to 44 pages as passed, thus giving us the one of the few watershed water bills with the "house bill" designation.

"consider" GCD management plans; their regional plans now must be consistent with the GCD plans.

3. GCD Rulemaking

HB 1763 also added a complex set of procedural requirements that GCDs must follow. GCD rules must be adopted only after notice and hearing, and the new law spells out the exact due process required. In regard to permitting, HB 1763 now requires that GCDs identify which permit actions require a hearing, and which do not. If a hearing is required, the GCD must comply with an entire new subchapter of required due process, Water Code Subchapter M. This is intended to provide landowners more due process rights, and to promote uniformity throughout the state, from GCD to GCD.

4. Desired Future Conditions

More importantly, HB 1763 introduced the term "desired future conditions" (DFC). A "Desired Future Condition" is exactly as it sounds: the local water planning entity determines a goal for each groundwater resource defined as the "future condition" of the resource. Examples of DFCs are:

1. Water levels do not decline more than 100 feet in 50 years
2. Water quality is not degraded below 1,000 milligrams per liter of total dissolved solids for 50 years
3. Spring flow is not allowed to fall below 10 cubic feet per second during the drought of record for perpetuity
4. 50% of the water in storage will be available in 100 years.

A DFC statement must be adopted by a 2/3rds vote of at least 2/3rds of the GCDs located in whole or in part within the same Groundwater Management Area.[34]

Once a GCD adopts a DFC, they are used to calculate Managed Available Groundwater volumes (see III.C.6 below). They are also then used for regional water plans, Groundwater Management Areas and permitting. The statute does not prohibit a GCD from changing its DFC statement more frequently than every 5 years from the date of the first change, and the TWDB seems to have the opinion that GCDs may update them at any time.[35]

The TWDB strongly prefers that DFCs be at least 50 years, the planning horizon for regional water planning.[36] The TWDB requires that DFCs be physically possible, individually and collectively, if different DFCs are stated for different geographic areas overlying an aquifer or subdivision of an aquifer within a Groundwater Management Area.[37]

5. Increased Cooperative Planning

HB 1763 changed optional joint planning to required joint planning. GCDs in the same Groundwater Management Area must work together to develop DFCs for their groundwater resources.[38] Exhibit 11 shows the GCDs and Groundwater Management Area boundaries on the same map.

6. Managed Available Groundwater (MAGs)

This was a new term introduced in HB 1763. "Managed Available Groundwater" (MAG) is the amount of water that may be permitted by a GCD for beneficial use in accordance with the Desired Future Condition of the aquifer.[39] For example, if a GCD adopted a DFC as "no more than 100 feet of water decline in 50 years", then the TWDB would estimate the maximum amount of water available for use in the next 50 years in order to meet that goal. That amount of water is the MAG available to the GCD, which it may allow to be consumed in its permitting process.

7. Required Permitting

HB 1763 also requires a GCD to issue permits up to the point that the total volume of groundwater permitted equals the MAG. This is a major change in water policy and was obviously designed to afford some protection to landowners against GCDs. GCDs do not have discretion in this matter. If there is water available based on the estimated MAG, the GCD must issue permits upon receipt of administratively complete applications up to the total amount of MAG.

8. Historical Use

GCDs may limit well production based on

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[34]Texas Water Code § 36.108(d-1)

[35]Robert E. Mace, Rima Petrossian, Robert Bradley and William F. Mullican, III, *A Streecar Named Desired Future Conditions: The New Groundwater Availability for Texas, in State Bar of Texas Prof. Dev. Program*, The Changing Face of Water Rights in Texas, Chapter 3 (2006), P. 6.

[36]Id. at p. 3, fn 20

[37]31 Tex. Admin. Code § 356.2(8)

[38]Codified at Texas Water Code § 36.108

[39]Texas Water Code § 36.001(25)

historic use.[40] Any limitation on the doctrine of absolute ownership of groundwater tends to provoke landowners. This has become a very controversial topic, and has, in some instances, been used in attempts to prevent water ranching. Previously, there was no standard definition of "historic use"; however, HB 1763 added Texas Water Code § 36.001(29), which defines "evidence of historic use" as

> evidence that is material and relevant to a determination of the amount of groundwater beneficially used without waste by a permit applicant during the relevant time period set by district rule that regulates groundwater based on historic use. Evidence in the form of oral or written testimony shall be subject to cross-examination. The Texas Rules of Evidence govern the admissibility and introduction of evidence of historic or existing use, except that evidence not admissible under the Texas Rules of Evidence may be admitted if it is of the type commonly relied upon by reasonably prudent persons in the conduct of their affairs.

Only time will tell whether this still-subjective definition cools the flames of dispute over historical use.[41]

9. Putting It All Together

In a nutshell, then, here is the water availability modeling process. The GCDs determine DFCs for their water resources and send them to the TWDB. Based on the DFCs, the TWDB determines and provides estimates of "Managed Available Groundwater" (MAG) to the GCDs. The GCDs then base their management plans on the MAG estimates. Their management plans are forwarded to the RWPGs, who fashion their regional plans based on the GCD management plans. These regional plans, once completed, are forwarded to the TWDB for inclusion in the next 5-year state water plan.

The GCDs then consider and issue water well permits based on the MAG estimates. They must issue permits up to the maximum MAG estimates, so long as they receive administratively complete permit applications. If it were only as easy in practice as it is in theory.

As you can see, if a landowner or operator has a problem obtaining a water well permit, it may be the result of planning that occurred many years prior to submitting the application. Water use is now subject and subordinate to water planning. For this reason, owners and operators who have or need groundwater resources should become familiar with, and involved in, the planning process as well as the permitting process, sooner rather than later (this means *now*) in order to maximize their opportunity to protect their ability to use their water resources.

10. For Land Not in a GCD

The map of GCDs (See Exhibit 11) on the TWDB website shows the geographic areas within a GCD as colored, whereas all non-GCD areas are white. These non-GCD areas are commonly referred to as the "White Areas." But just because land is not in a GCD does not mean it is not affected by GCDs. HB 1763 allows GCDs to plan for the non-GCD white areas.

The DFCs that GCDs develop for MAG estimates will also be used to develop MAG estimates for the white areas. Any new GCD created in the white areas will have to follow the existing DFC statements and MAG numbers at least until the next time DFCs are considered.

D. The Water Trifecta (80th Leg. R.S., 2007)

The 80th Legislature passed three significant water bills in its waning days. These generally tweak the existing planning cycle by imposing additional planning considerations to protect necessary environmental flows, and they elevate the role of conservation in future water planning.

1. House Bill 3/Senate Bill 3

HB 3/SB 3 creates a series of advisory groups, teams and committees charged with determining how to balance demand for water with the natural environmental requirements of our state riverine, bay and estuary systems. The top-level advisory group, labeled the "Environmental Flows Advisory Group," is to issue a report of their activities and recommendations in the December prior to each regular legislative session, presumably so that the Legislature can enact laws implementing those recommendations.

These bills also will affect how the TCEQ makes decisions regarding certain permits. From a very broad perspective, these bills begin to take into account the concept that it is unwise to consume all of the water resources in our state. Some resources must be saved in order to preserve the overall environmental system.

[40] Texas Water Code § 36.116(b)

[41] SB 17 (81st Leg. R.S., 2009) was filed in the 2009 Texas legislative session to yet again change this definition. It did not pass.

However, denying ourselves today in order to reap a benefit later is not a politically popular idea.

The save-some-for-tomorrow plan is generally implemented on a practical level through the TCEQ's permitting process. This bill requires the TCEQ to consider more factors in issuing and modifying certain permits, and it allows the TCEQ to make certain unilateral changes to issued permits as scientifically-determined environmental needs dictate. Among other things, for example, this bill requires the TCEQ to adopt environmental flow standards for each river basin and bay system. These standards are to be those necessary to support a sound ecological environment, and to establish and set aside an amount of unappropriated water to satisfy environmental flow standards. The TCEQ must also establish procedures to implement an adjustment of the conditions included in a permit or amended water right. The TCEQ is then prohibited from issuing or amending permits inapposite to these new standards.

One aspect of HB 3 that received significant press during the session was the section designating future reservoir sites. The conference committee on SB 3 struck the language in the bill naming the 19 sites where future reservoirs may be built, and substituted a paragraph stating that unique reservoir sites are determined by the state water plan. Since these 19 future reservoir sites were determined and identified in the state water plan, this appears to be a change in language with no change in effect.

2. House Bill 4

HB 4 creates a Water Conservation Advisory Council (WCAC). The WCAC is to monitor water conservation trends and technologies, regularly report to the Legislature its monitoring conclusions, and implement a statewide water conservation public awareness program.

However, it then provides that the TCEQ must require a retail public utility with 3,300 or more connections to submit to the WCAC a water conservation plan based on specific targets and goals, and using appropriate best management practices or other water conservation strategies. These retail public utilities must report annually to the WCAC on their respective progress in implementing the conservation plan. The WCAC and the TCEQ must jointly adopt rules to: (1) identify the minimum requirements and submission deadlines for these water conservation plans; and (2) provide for the enforcement of this new law and the jointly adopted rules.

Other parts of this bill deal specifically with a rainwater harvesting. Rainwater harvesting is a process in which rain is collected and stored, often captured from the roof of a structure and deposited into a cistern, where it is then used in and around the structure for non-potable and/or landscaping uses. Based on the author's personal experience, this appears to be a rather popular water conservation plan around the Carribean; however, our much drier Texas climate (i.e. drought) will make this strategy much more challenging.

E. The Current Planning Cycle

Texas water planning is ongoing, with different efforts occurring at the state, regional and local levels.

1. State Level

At the state level, the TWDB is currently assisting GCDs in the finalization of their DFCs, and developing MAG estimates based on those DFCs. The TWDB adopted the 2007 State Water Plan on November 14, 2006. It will adopt the 2011 State Water Plan in late 2010. This will be the first State Water Plan to be based on the restrictions on groundwater use imposed by the DFCs. Additional restrictions on the use of groundwater are expected to be imposed by the environmental flows requirements as they are developed.

2. Regional Level

At the regional level, the RWPGs are beginning the third cycle of planning, preparing their 2011 regional water plans. The third regional planning effort (for 2007-2010) should include the following activities:[42]

1. Update the last regional water plan based on new population and water demand projections;

2. Determine DFCs;

3. Develop and revise water supply and water availability estimates based on new MAG and Water Availability Models;

4. Evaluate and recommend water management strategies to meet water supply needs, with greater emphasis on water conservation; evaluate the impacts of water management strategies on the environment;

5. Consider and recommend changes to current water policy and water law in Texas to better manage state water resources.

[42] Derived from 31 Tex. Admin. Code Chapter 357

This third planning period, which has already begun for the RWPGs, should be similar to the second planning period, with the addition of adopting plans that meet the DFCs. The third planning period should proceed as follows:

Winter 2007	RWPGs complete draft population projections and begin 6-month comment period
Spring 2008	RWPGs complete draft water demand projections and begin 6-month comment period
Spring/Summer 2009	TWDB approves population and water demand projections
2008-2009	RWPGs to hold public meetings prior to Regional Water Plan preparation; public hearings on Regional Water Plans required prior to adoption
March 1, 2010	Initially prepared (draft) Regional Water Plans due to TWDB
January 5, 2010	RWPG-adopted Regional Water Plans due to TWDB
January 5, 2011	TWDB-approved State Water Plan due to the Legislature

3. Local Level

GCDs are constantly in a state of planning. They are required to adopt a management plan not later than 3 years after formation, and must update that plan every five years thereafter.[43] To determine the planning cycle of a GCD, then, one must determine the date of adoption of its last management plan, and monitor the GCD for its notice of drafting the next version.

4. Timing Problems in the Current Planning Cycle

Texas Water Code § 16.108(d) requires GCDs in Groundwater Management Areas to submit their DFCs to the TWDB by September 1, 2010. However, for MAG estimates (which are derived from DFCs, as explained above) to be used in the next round of regional and state water planning (2007-2012), DFC statements will need to be submitted much earlier, perhaps as early as late 2007 or early 2008. This is necessary so that TWDB staff may estimate or review MAG numbers, and so that RWPGs may include the new MAG amounts into their planning documents. GCDs are developing their DFCs as you read this paper.

IV. THE METROPLEX'S SURFACE WATER PROBLEMS

This section focuses on municipal water supplies for the Dallas/Fort Worth Metroplex area because its urban area is supplied by surface water from reservoirs. All of this area is in Regional Water Planning Area C. Water availability in the Metroplex is set to change dramatically over the next several years because our population has now reached and is beginning to test the limits of our current water supply. As with any resource whose supply becomes limited, fights over rights will become more frequent. Unless otherwise indicated, all statistics in this section are from the adopted Region C Water Plan (2006) (2006 Region C Plan) .

A. Population Projections

With a 2000 population of 5,254,722, Region C was the most populous area in Texas by around 400,000 people in that year, and it is projected to extend its lead over the next 50 years. In 2060, Region C is projected to be home to 13,087,848 individuals, an increase of 149.1%. The next most populous region is projected to have a 2060 population of 10,897,526. In other words, as all of Texas adds population, Region C will exceed the next closest area's growth by an additional 2.2 million people.

Exhibit 15 shows the historical and projected population trends in Region C. It is also a good example of how figures can change from one planning cycle to the next. For the years 2000 through 2050, there are two bars next to each other. The bar on the left represents the population projection adopted and used by Region C in the first round of planning (2001 Region C Plan). Year 2000's historical (actual) population exceeded the projection, and Region C increased these projections in the second round of planning which culminated in the 2006 Region C Plan. These are represented by the bar on the right. Region C is now expected to grow even faster than was projected 5 years ago.

Region C has 25.2% of the entire state's population. It is heavily urbanized, with 81% of the population living in cities that have a population in excess of 20,000 people. This has meaning in the context of water use. Most of the water use in Region C is municipal, meaning it comes from a municipal water supply provider. Interestingly, the small amount of irrigation use in Region C is not for agriculture but to

[43] Texas Water Code § 36.1072

water golf courses.

B. Available Surface Water Supply

Region C, and thus the Metroplex, obtains its water primarily from reservoirs in Region C and by importing water from out-of-area reservoirs. The reservoirs supply various wholesale water providers across the area. Generally all of our urban areas are supplied with surface water from reservoirs. In fact, over 90% of water use in Region C is supplied by reservoirs. In 2000, the three largest wholesale water suppliers in Region C provided 75% of all water used in Region C, and this is expected to continue. These are:

Dallas Water Utilities
Tarrant Regional Water District
North Texas Municipal Water District

(referred to herein as the Big 3). Each of these providers has a different volume of water supply that it can supply to its customers, and each of these providers has a different number of customers. The effect of these differences will be discussed below.

Only 7.4% of Region C's water supply comes from groundwater. Groundwater pumping is highest in Denton, Grayson, and Tarrant Counties. These three counties have 47% of the region's total groundwater pumping. Groundwater will be discussed in greater detail in Section V below. There are no springs in Region C that are currently used as a significant source of water supply.

Exhibit 16 is Table 3.1 and Figure 3.1 from the 2006 Region C Plan. These show the projected overall water supply available to Region C. Note that the Region C 2006 Plan revised the available water supply from the 2001 Region C Plan, showing a decrease in water supply. This Exhibit does not take into account any of the new water sources currently being planned or constructed for the benefit of Region C.

C. Projected Water Use and Demands

As these exhibits make clear, our population is growing very rapidly, while our current water supplies are decreasing. **Exhibit 17** is a comparison of currently available supplies and projected demands. This exhibit demonstrates that the Metroplex is approaching, and may now be, at the limit of its current water supplies.

The substantial majority of the projected water shortage is for municipal water. By 2010, Collin, Cooke, Dallas, Denton, Ellis, Henderson, Kaufman, Rockwall and Wise counties show a net need for more water. In general, the largest water needs are in Collin, Dallas, Denton and Tarrant Counties.

This begs the question of whether these water demands will be met, and if so, how. The answer to this question forms the central focus of the 2006 Region C Plan. One of the first strategies will be for the Big 3 to connect the unconnected supplies that could be made available to the Region. An unconnected water supply is an existing and permitted supply that is not currently available due to infrastructure limitations. If these were timely added to the area's water supply, it would extend the ability to meet the projected demand for Region C until 2020, but by 2020 the projected demand for Region C will exceed total connected and unconnected supply.

Another obvious strategy is conservation, the reduction of demand. **Exhibit 18** shows the amount of water used per capita across the state. Three of the 10 highest per capita users are in the Metroplex (Richardson, Dallas and Plano). Likewise, three of the 10 lowest users are in the Metroplex (Mesquite, Denton and Grand Prairie). Carrollton, Fort Worth, Arlington, Garland, McKinney and Lewisville are intermediate users. If Region C fully implemented all planned conservation and reuse measures for municipal water use, the region's water supply could be extended until sometime beyond 2010, assuming no dry years between now and then. One dry year is predicted to match supply with demand in 2010, and cause supplies to fail to meet demand thereafter. This effect is shown in **Exhibit 19**.

These are discouraging statistics. Neither connection of currently unconnected supply sources, nor conservation, will meet projected demand. According to Region C, new water supplies must be developed to meet the projected demand. **Exhibit 20** shows the effect of developing a multitude of new supplies specifically identified in the Region C 2006 Plan.

At first glance, this readily appears to solve all water supply problems for the Metroplex. However, the wise practitioner should realize that this exhibit relies on a series of assumptions critical to its conclusions. If any of those assumptions do not come true, the area may suffer a shortage requiring extreme conservation methods. Furthermore, having a sufficient supply of water relies on these new water supplies becoming available at a particular time. Even a slight delay in the timeline of any one of these projects could cause a temporary, but severe, water supply shortage.

D. Water Supply by Supplier

Furthermore, the analysis of the area's municipal water supply maybe dissected into more detail. Since the Metroplex area is supplied by the Big 3, any one of the Big 3's failure to bring a projected new water source online by the projected date will affect not the entire area, but only the area of the Metroplex served by that particular supplier. So if, for example, North Texas Municipal Water District fails to obtain a water permit for an additional volume of water from Lake Texoma, while the other 2 major suppliers meet their projections, then the only areas of the Metroplex negatively affected would be those served by North Texas Municipal Water Supply. If Tarrant Regional Water Supply fails to construct the third pipeline from Richland-Chambers Reservoir on a timely basis, its service area will suffer a water shortage while the areas serviced by Dallas Water Utilities and North Texas Municipal Water Supply will suffer the same experience.

Translating this into practical applications, real property that is located in an area with more water resources available, meaning it can withstand drought conditions longer before running out of water, is more valuable than real property located in an area more vulnerable to drought restrictions. Similarly, businesses would logically prefer to locate their facilities and offices in areas with a "better" supply of water.

For these reasons, it is helpful to evaluate the relative strength of the Big 3. **Exhibits 21, 23 and 25** show the currently available water supplies for each of the water suppliers, and **Exhibits 22, 24 and 26** show the future water volumes available to each of these water suppliers, and they show the year in which these suppliers are projected to obtain the new water supplies. From these exhibits one can interpolate how quickly demand will outstrip supply if a particular new source is not timely connected. As a result these exhibits also illustrate how important it will be for each supplier to bring the listed new sources online timely.

E. The Impact of Water Supply Failing to Meet Demand

Because Region C must rely on the Big 3 to develop new municipal water supplies, in a timely manner, it is prudent to consider the effect of a failure by one or all of them on the Metroplex area. The Region C Water Planning Group developed and included three projections in its 2006 Region C Plan that show the financial impact to the area. Attached as **Exhibit 27** is Table 4A.6 from the 2006 Region C Plan, which shows the impact in lost income received, and taxes collected by governments, by county. It projects a total loss of $160,739,000,000 just in Region C, from 2010 to 2060. Dallas County is projected to experience the most loss ($82,421,000). Tarrant County is in second place ($28,972,000, followed closely by Collin County ($24,269,000).

Exhibit 27 also contains Figure 4A.4 from the 2006 Region C Plan, and it shows the annual economic impacts of not meeting water needs for Region C by decade. These projected losses begin as early as 2010. Finally, **Exhibit 28** is Figure 4A.5 from the Region C 2006 Plan, and it shows the projected jobs losses and population losses in Region C if the suppliers fail to meet Region C's water needs. According to these projections, the area would begin to experience population declines by 2010.

V. THE METROPLEX'S GROUNDWATER SUPPLY CONCERNS

Today, the Metroplex's groundwater supply concerns may exceed its surface water problems. The TCEQ has recently determined that the current use of groundwater exceeds the reliable long term supply available in some parts of the Metroplex area. Historically we have been able to ignore these problems because groundwater production was completely unregulated; however, those days are quickly coming to an end. Metroplex area groundwater production will soon be regulated, limited, and, in some areas, taxed.

Although groundwater use is also subject to planning, planning groundwater use is materially different in comparison to surface water. Surface water is much easier to quantify and manage. Groundwater is very difficult to quantify, although scientific advances are generally providing more reliable predictions of our groundwater resources. Groundwater analysis and use is changing in this third round of state planning because this is the first round to use DFCs, GAMs and MAGs. Texas will not feel the impact of these recent and very material developments until adoption of the 2012 State Water Plan.

The primary users of groundwater in the Metroplex area are remote rural waters suppliers, individual businesses, certain types of industries, rural landowners, and small municipalities. Generally, groundwater supports rural area development in areas around the fringes of a developed area, but still beyond the reach of municipal water suppliers. Attached as **Exhibit 29** is a picture of the water wells in the area used for public water supply. Once an area reaches critical mass, it is moved from groundwater to surface water. Wells are plugged, pumps removed, and lines are tied in

to a municipal water supply. Historically groundwater use does not decline when an area changes from groundwater to surface water, because development, and associated groundwater use, merely moves beyond the reach of the newly expanded surface water supply lines.

A. Area Groundwater Resources

Groundwater produces 7.4% of overall water use in the area. The Trinity aquifer and Woodbine aquifer are the primary groundwater resources available to the Metroplex area. Groundwater pumping is highest in Denton, Grayson, and Tarrant Counties. These 3 counties have 47% of the region's total groundwater pumping. The Trinity aquifer's outcrop, a major aquifer, runs South from the Red River, to the West of the Metroplex, mainly through Montague, Wise, Parker, and Hood counties. Only its subcrop is found in Cooke, Grayson, Denton, Collin, Tarrant, Dallas, Johnson and Ellis counties. The Woodbine aquifer, a minor aquifer, also runs South from the Red River but is generally West of the Trinity and therefore offers more availability to the Metroplex. The Woodbine aquifer's outcrop runs along the Montague/Grayson county border, then through Western Denton, Tarrant and Johnson counties. Its subcrop also runs through Collin, Dallas and Ellis counties.

Both of these aquifers have been overdrafted for many years, which means more water is being taken out of them than is flowing into them. As a result, water levels in both aquifers are declining and artesian pressures are falling. This causes well operators to either run their pumps longer to maintain water flow, dig deeper wells, or cease production.

B. Regulating Groundwater Use

Historically, groundwater use in and around the Metroplex has been completely unregulated. Until recently, no regulatory authorities (GCDs) existed, nor did state law allocate to any other local entity the power to plan water use in this area. These conditions have completely changed within the past several months. Two GCDs now exist in the area, and more are being planned. These will regulate (restrict and perhaps tax) groundwater use. Future water production from the Trinity and Woodbine aquifers for the Metroplex area is now being planned by Groundwater Management Area 8, and water production will be subject to and in conformity with those plans no later than 2010.

Notwithstanding the current overdrafting of these resources, the Region C 2006 Plan recommends that 41 water user groups in this area increase the use of water from the Trinity aquifer. It also recommends that 23 water user groups in the area increase use of the Woodbine aquifer. These groups are projected not only to continue to overdraft the Trinity aquifer, but to increase the overdraft and depletion. This increased groundwater use is deemed necessary to meet water demands in the areas served by groundwater. The Region C 2006 Plan also recommends that 33 water user groups reduce their reliance on these aquifers, but it is projected to take until at least 2020 for those reductions to equal the increased use of the 64 groups increasing their use.

Groundwater Management Area 8 (GMA 8) is responsible for planning the use of these two water resources. Generally, GMA 8 adopts the Desired future conditions (DFCs) for the aquifers (which is what condition they want the aquifer to be in 50 years), sends those DFCs to the TWDB, which computes the volume of groundwater that can be produced from the aquifer to meet that DFC (defined as Managed Available Groundwater or MAG). The MAG estimates must be used by GCDs in the area. GCDs must not allow more water production than the MAG estimate.

The DFCs for the Woodbine Aquifer were adopted by GMA 8 at its December meeting held on December 17, 2007, which include the following:

Collin County

From estimated year 2000 conditions, the average draw down should not exceed approximately 154 feet after 50 years.

Dallas County

From estimated year 2000 conditions, the average draw down should not exceed approximately 112 feet after 50 years

Denton County

From estimated year 2000 conditions, the average draw down should not exceed approximately 16 feet after 50 years.

Ellis County

From estimated year 2000 conditions, the average draw down should not exceed approximately 102 feet after 50 years

Grayson County

From estimated year 2000 conditions, the average draw down should not exceed approximately 28 feet after 50 years.

Tarrant County (NTGCD)
From estimated year 2000 conditions, the average draw down should not exceed approximately 2 feet after 50 years

GMA 8 adopted final DFCs for the Trinity aquifer on September 17, 2008.[44] They will be published by GMA 8 in the very near future. The TWDB is now developing MAG estimates for that aquifer. Those will then become water production limitations for that aquifer, managed by the new area GCDs.

Attached as **Exhibit 30** is a chart of the Managed Available Groundwater (MAG) amounts for the Woodbine aquifer, by county. This exhibit shows the volume of water that may be produced from the Woodbine aquifer. It is a limitation on water production. Area GCDs will be responsible for enforcing this limitation. Although there are only 2 GCDs in the Metroplex area as of March 2009, as discussed below, two new Priority Groundwater Management Areas have been designated over the Metroplex ,which will jump start the quick creation of GCDs in and around the Metroplex.

C. Water Use in Developing the Barnett Shale

Some experts are of the opinion that the proverbial straw that may break the Trinity aquifer's back is the continued development of the Barnett Shale. Groundwater is used in the production of oil and gas. From December, 2004, through November of 2005, crude oil production in the Metroplex area was almost 5.4 million barrels, and gas well gas production exceeded 486 trillion cubic feet.

The amount of water required for any given oil or gas well can vary substantially, depending on the depth of the well, the type of well, and any problems incurred while drilling the well. Some industry sources report the typical use of 420,000 gallons during drilling and another 4 million gallons to drill and hydraulically fracture a well.[45] Other reported statistics show that when well fracture technology is used, a typical Barnett Shale vertical completion requires approximately 1.2 million gallons (3.68 acre-feet) of water, and a typical horizontal Barnett Shale completion requires around 3.5 million gallons (10.74 acre-feet) of water.[46]

From December, 2004, through November of 2005, crude oil production in the Dallas-Fort Worth Metroplex area was almost 5.4 million barrels, and gas well gas production exceeded 486 trillion cubic feet.[47] As of September of 2005, the following numbers of oil and gas wells were located in the indicated counties:[48]

Oil:		Gas:	
Cook	3,054	Wise	3,797
Montague	2,874	Denton	1,833
Navarro	2,096	Parker	1,367
Grayson	999	Tarrant	624
Wise	951	Hood	336
TOTAL:	9,974		7,957

Texas Railroad Commission staff is of the opinion that it may take over 50,000 wells to fully develop the Barnett Shale.[49] If the above use estimates are accurate, the Dallas-Fort Worth Metroplex area could see as many as 42,000 additional gas wells over the next 15-20 years, using between 3.68 and 10.74 acre-feet of water each, which translates to somewhere between 154,560 and 451,080 acre-feet of water necessary to fully develop the Barnett Shale over time.[50] In Denton, Hood, Johnson, Parker, Tarrant and Wise counties, 4,834 new water wells were drilled over a 44 month period

[44] See GMA 8's press release dated September 18, 2008, which may be viewed at http://www.gma8.org/images/stories/dfcs/press%20release--gma%2018sep08.pdf

[45] Mills, *Updated Evaluation for the North-Central Texas - Trinity and Woodbine Aquifers - Priority Groundwater Management Study Area* (TCEQ Water Supply Division, June, 2007) (the Mills Study) at p. 44

[46] Harden Study at p. 6

[47] Mills Study at p. 18

[48] *Id.*

[49] *Id.* at p. 49

[50] Currently, the definition of Managed Available Groundwater (MAG) does not include the quantity of water produced from an exempt well (because, for example, it is used in the production of oil and gas). Some professionals in this area advocate including all exempt uses in MAG, or deducting the water volume used for exempt purposes from the MAG figure. In effect, if water used for oil and gas production, exempt from GCD regulation, equaled or exceeded the MAG production limitations based on Desired Future Conditions (DFCs), this would at least in theory mean there may be no water in the Trinity aquifer for any use other than for the production of oil and gas. This theory also assumes that the MAG derived from an aquifer's DFC(s) is a limitation on production. If MAG is a floor, this concern goes away. This issue (DFC as floor vs. ceiling) seems to currently be in flux.

ending in August of 2006.[51] Approximately 5% (241 wells) were used in the drilling and fracturing of Barnett Shale gas wells.[52]

D. Designating the Area a PGMA

In 2007 the TCEQ completed two different studies, each of which determined that a number of counties over the Barnett Shale should be designated as PGMAs. Attached as **Exhibit 31** is a map of the Barnett Shale laid over the Trinity and Woodbine aquifers, to which I have manually added the boundaries of these 2 new PGMAs. The PGMAs basically go from the Texas-Oklahoma border continuously South through Waco.

On June 26, 2007, TCEQ staff recommended that Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hood, Johnson, Montague, Parker, Tarrant and Wise counties should be designated as the North Central Texas (Trinity and Woodbine Aquifers) PGMA.[53] The TCEQ filed the Mills Study with the Office of the Chief Clerk of the TCEQ on June 26, 2007. The Mills Study detailed how some (but not all) counties in the North Central Texas study area met the statutory PGMA definition, namely that they were expected to experience, within the next 25 years, critical groundwater problems, including shortages of surface water or groundwater, land subsidence resulting from groundwater withdrawal, and contamination of groundwater supplies.

The question of whether to designate this area a PGMA, and if so how to design GCDs, was referred to the State Office of Administrative Hearings (SOAH) for a contested case hearing, and the administrative law judge (ALJ) held a public hearing on May 13, 2008, at which she considered two issues: (A) whether some or all of the area should be designated a PGMA; and (B) how the area should be covered by one or more GCDs, namely: (i) whether one or more GCDs should be created within the proposed PGMA; or (ii) whether all or part of the land in the proposed PGMA should be added to an existing GCD; or (iii) whether a combination of those actions should be taken.

The ALJ issued her proposal for decision (PFD) on September 2, 2008. The PFD concluded that a PGMA should be designated, and remarked that there was no controversy over that issue. The PFD recommended that the TCEQ form one GCD consisting of all counties in the proposed PGMA not already in a GCD, namely: Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, and Johnson counties. On February 18, 2009, the TCEQ designated Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hood, Johnson, Montague, Parker, Tarrant, and Wise counties as the Northern Trinity and Woodbine Aquifers PGMA. The TCEQ Order adopted the PFD which recommended a single, multi-county GCD for the included counties.

Similar to the North Central Texas study and process of designating that PGMA, on January 9, 2008, TCEQ staff recommended that 5 counties should be designated as the Central Texas (Trinity Aquifer) PGMA.[54] The Byrd Study explained how some (but not all) counties in this study area met the statutory test for a PGMA. This matter was also referred for a contested case hearing, and the ALJ held the public hearing on May 1, 2008. The ALJ issued his PFD on July 28, 2008. On October 31, 2008, the TCEQ accepted this PFD and designated Bosque, Coryell, Eastland, Hill, McClennan and Somervell counties as the Central Texas (Trinity Aquifer) PGMA.

The purpose of designating an area as a PGMA is to cause the quick formation of one or more districts with the power to regulate groundwater use for the entire area. The designation of a PGMA by the TCEQ cannot be appealed nor may it be challenged under Water Code § 5.351 or Govt. Code § 2001.038. Within 2 years after the TCEQ issues its order designating a PGMA, the landowners in the PGMA must create one or more GCDs to cover the entire PGMA. For land in the PGMA not in a GCD by the end of this two year period, the TCEQ must either create a GCD for some or all of those areas, or recommend to an existing GCD that some or all of the land be added to that GCD.[55] An existing GCD must follow certain procedures to consider and act on the TCEQ's recommendation to add land to the existing GCD.[56] If the GCD does not approve adding new area to the GCD, then within one year after that vote the TCEQ must form a new GCD for that area or advise the Legislature whether it should take legislative action to

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[51] Mills Study at p. 46

[52] *Id.*

[53] See, generally, the Mills Study

[54] Byrd, *Updated Evaluation for the Central Texas–Trinity Aquifer–Priority Groundwater Management Study Area* (TCEQ Water Supply Division, December, 2007) (the Byrd Study)

[55] 30 Tex. Admin. Code § 294.43(e)

[56] 30 Tex. Admin. Code § 294.44(a)-(c)

address the need for groundwater management in the PGMA.[57]

As noted above, GCDs are created either by the Legislature or the TCEQ. All of Bosque, Coryell, Hill, McLennan and Somervell counties must be in a GCD by October 31, 2010. On November 1, 2010, the formation of GCDs for these counties will be delegated to the TCEQ and the TCEQ will proceed to form GCDs over all areas in this PGMA not already in a GCD, in accordance with the applicable PFD. Similarly, Collin, Cooke, Dallas, Denton, Ellis, Fannin, Grayson, Hood, Johnson, Montague, Parker, Tarrant, and Wise counties must be in a GCD by February 12, 2011, to avoid the delegation of this power to the TCEQ for it to proceed in accordance with its applicable PFD.

Since the legislature only meets every two years, there will only be one legislative session held before the end of these two year PGMA periods, namely, the 81st Legislature's regular session in 2009.[58] As a result, several GCDs were formed for this PGMA in the 81st Legislature's regular session, as local interested parties were likely motivated to preempt formation of GCDs as proposed by the PFDs adopted by the TCEQ. Specifically, the following GCDs were created by the 81st Legislature:

Grayson and Fannin Counties: Red River GCD (Senate Bill 2529)

Ellis, Hill, Johnson, Somervell Counties: Prairielands GCD (Senate Bill 726)

Collin, Cooke, Denton Counties: North Texas GCD (Senate Bill 2497)

As a result, GCDs have been formed for every county in the Northern Trinity and Woodbine Aquifers PGMA except only Dallas County.

[57] 30 Tex. Admin. Code § 294.44(d)

[58] The 82nd Legislature's regular session will begin in January, 2011. Bills passed in that session generally take effect in June of 2011 or the first week of September, 2011. Theoretically, the Governor could declare the formation of GCDs in the Northern Trinity and Woodbine Aquifers PGMA to be an emergency item, thereby allowing the 82nd Legislature to consider GCD formation bills within the first 30 days of the session. The Legislature could pass a bill very early in the session and (assuming the necessary votes) provide that it became effective immediately upon passage and signature by the Governor, but the probability that such a bill could be passed by February 12, 2011, is very small.

E. One Practical Effect of a PGMA

One practical effect of designating this area a PGMA and subjecting it to GCD regulation is that groundwater users may be forced to convert to surface water supplies more quickly. As discussed above, the Metroplex's surface water supplies are already near or at their limits, and if this movement occurs too quickly it may test the boundaries of the area's surface water supplies sooner. This problem will be exacerbated if the definition of MAG includes exempt uses such as certain water used in connection with the production of oil and gas, because exempt uses trump other uses, such as municipal water supplies.

VI. A BRIEF INTRODUCTION TO GCDs

Since the goal of designating this area as a PGMA is to force creation of GCDs, area professionals need a basic working knowledge of GCDs. GCDs are governed by their enabling legislation and Texas Water Code Chapter 36. This paper will address four topics: formation, operations, governance and finance.

A. Formation

There are four ways to create a GCD.

1. The most common way to form a GCD is by statute passed by the state legislature. Enabling statutes of each GCD created by the legislature may be found in the Special District Local Laws Code. These enabling statutes can grant or restrict a district's taxation powers, eminent domain powers, or provide for additional powers such as water control and improvement.

2. A second way to form a GCD is for property owners in the area to file a petition with the TCEQ. This process is set out in Texas Water Code Chapter 36, Subchapter B.

In each of these two options, temporary directors are appointed in the statute or TCEQ decision, and a process is laid out for an election held for persons in the proposed area. The voters must "confirm" the GCD by a majority vote.

3. In a PGMA, the TCEQ can create a GCD on its own motion. The process is similar to that referenced in Option 2 above, but action is initiated by the TCEQ rather than by landowner petition.

In this option, temporary directors are appointed by the county commissioner's court(s) and an election is then held to elect directors.

4. Territory may be added to an existing GCD, if the GCD is willing to accept the new territory.

B. Operations

The focus of a GCD is to regulate the production and use of groundwater. To do that, a GCD develops a comprehensive management plan[59] that may:

- require registration of wells
- require metering of wells
- require permits for any new well or any increase in the capacity of an exiting well
- impose well construction standards
- impose well plugging requirements
- impose water production limits (based on pure volume, or in proportion to the size of the tract)
- impose well spacing restrictions
- impose different production restrictions for "historic use"

A GCD must adopt its management plan and submit it to the TWDB for approval within 3 years after its creation.[60] GCD rules must be consistent with its management plan.[61] GCDs must review and re-adopt its management plan, with or without revisions, at least once every 5 years.[62] GCD operations include monitoring compliance and enforcing penalties for noncompliance.

C. Governance

GCDs are governed by a board of directors of between 5 and 11 persons, each of whom serve a four year term.[63] GCDs are required to have a president, vice president and secretary; they may have any other officers desired.[64] The board may, and most if not all do, adopt bylaws.[65] Boards must meet at least quarterly.[66]

Generally, if a GCD is in only one county, all board members will be from that county. Board composition for GCDs covering more than one county differs based on the method of taxation. Generally, if the GCD will tax property value, representation among multiple counties is more equal between the counties, whereas if the GCD will tax production of groundwater, board representation will be based on proportional groundwater production, with higher producing counties having more representation.

D. Finance

There are at least two different issues involved in finance: raising money and spending money.

1. Raising Money

GCDs raise money by selling bonds and notes, and collecting taxes and fines. GCDs can tax all property in the GCD based on value, similar to an independent school district, or they can tax water production, or both.

If a GCD levies a tax on property values, it cannot assess more than $0.50 on each $100 of assessed value, and any GCD tax on property value must be approved by a majority of voters at an election.[67] If a GCD assesses production fees based on the amount of water authorized by permit to be drawn, or the amount actually withdrawn, the production fees cannot exceed: (1) $1 per acre foot of water payably annually for water used for agricultural use; or (2) $10 per acre foot payable annually for water used for any other purpose.[68]

GCDs must obtain TWDB approval to issue and sell bonds and notes to support its operations.[69] Their bonds and notes are free from state and local taxation.[70] GCDs can also obtain grants and loans from the TWDB.

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[59] Texas Water Code Section 36.1070(a)

[60] Texas Water Code Section 36.1072(a)

[61] Texas Water Code Section 36.1071(f)

[62] Texas Water Code Section 36.1072(e)

[63] Texas Water Code Section 36.051

[64] Texas Water Code Section 36.054

[65] Texas Water Code Section 36.057(f)

[66] Texas Water Code Section 36.064

[67] Texas Water Code Section 36.201

[68] Texas Water Code Section 36.205(c)

[69] Texas Water Code Section 36.171(a)

[70] Texas Water Code Section 36.179

GCDs may impose civil penalties for violating its rules. A GCD can impose a fine for breach of any rule of up to $10,000 per day per violation, and each day of a continuing violation constitutes a separate violation.[71]

2. Spending Money

One question that arises when considering GCDs for the first time is how they spend their money. GCDs must prepare and approve annual budgets.[72] Generally, they spend money to develop their management plan, fund studies of their groundwater resources to determine how much groundwater exists in the district (these are undertaken by consultants and experts such as hydrologists), design regulations affecting groundwater in conformity with their management plans, and fund their directors, staff and daily operations.

Directors may receive a fee of not more than $150 per day for each day the director actually spends performing the duties of a director, which may not exceed $9,000 in any year.[73] They may be reimbursed for actual expenses reasonably and necessarily incurred in furtherance of GCD business.[74]

E. Exemptions from GCD Regulation

Texas law exempts certain wells from regulation by GCDs, as follows:

(1) a well used solely for domestic use or for providing water for livestock or poultry on a tract of land larger than 10 acres that is either drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater a day;[75]

(2) the drilling of a water well used solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the Railroad Commission of Texas provided that the person holding the permit is responsible for drilling and operating the water well and the well is located on the same lease or field associated with the drilling rig;[76]

(3) the drilling of a water well authorized under a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code, or for production from such a well to the extent the withdrawals are required for mining activities regardless of any subsequent use of the water;[77] and

(4) the entirety of Chapter 36 (GCDs) does not apply to production or injection wells drilled for oil, gas, sulphur, uranium, or brine, or for core tests, or for injection of gas, saltwater, or other fluids, under permits issued by the Railroad Commission of Texas.

This Section of the Texas Water Code, namely Section 36.117, is a model of poor drafting and statutory ambiguity. I have written an entirely separate paper attempting to interpret and construe this section. See, McPherson, *Don't Hand Me No Lines and Keep Your GCD Hands To Yourself* (Changing Face of Water Rights Advanced Course, TexasBarCLE, 2009).

VII. WHAT THIS MEANS FOR METROPLEX AREA REAL ESTATE PROFESSIONALS

Because the Metroplex is either nearing or already at the area's surface water supply limits, the looming future hiccups in the water supply and demand will be quickly felt by area residents in their daily lives, which will heighten concern about and attention on their various water rights. The imminent regulation of groundwater will only further focus attention on water rights. Metroplex area real estate professionals will now more frequently encounter water rights issues in transactions, in the administrative arena, and sometimes in civil litigation.

A. Transactions

Among other things, clients and potential clients may need assistance in transactions, such as:

- in lease transactions, allocate responsibility to interact with the GCD and/or pay the GCD tax
- sever water rights from the fee simple (e.g. by deed reservation-NOTE: DO NOT USE

[71] Texas Water Code Section 36.102(b)

[72] Texas Water Code Section 36.154

[73] Texas Water Code Section 36.060(a)

[74] Texas Water Code Section 36.060(b)

[75] Texas Water Code Section 36.117(b)(1)

[76] Texas Water Code Section 36.117(b)(2)

[77] Texas Water Code Section 36.117(b)(3)

MINERAL INTEREST LANGUAGE TO ACCOMPLISH THIS)

- use water rights as part of a Section 1031 property exchange (they qualify!)
- verify positions taken by a supplier or regulatory entity that negatively impacts a client [Note: just because a water supplier or regulatory body advises that it "cannot" provide water service or take action in a particular situation does not always mean that they are correct. Sometimes the supplier's or regulator's board or managers simply are not aware of their abilities; sometimes the "mistake" is not unintentional.]
- the appropriate due diligence for purchasing or leasing real property will differ based on whether the property is to be served by groundwater or surface water
- in connection with the prospective purchase or lease of land, evaluate the effect of a water rights restriction on its contemplated use
- once GCDs issue water use permits, assist in the transfer of those permits
- verify a surface water supplier's available projected future water supply
- verify that a surface water supplier is meeting the goals and benchmarks set out in the Region C 2006 Plan
- if a client is comparing different properties serviced by different water suppliers, evaluate the comparative strengths and weaknesses of those water suppliers
- if suppliers restrict water supply (e.g. to a new development) or refuse water supply, independently verify whether the water supplier is correct, and if necessary educate the supplier (or discuss with the client the possibility of filing a lawsuit or regulatory action)

B. Administrative

Since water regulation includes substantial involvement of quasi-governmental entities, clients may also need assistance in administrative matters, such as:

- Assist in applying for and obtaining a water permit from a GCD
- Defend persons and entities from GCD enforcement actions
- File an administrative case to force a recalcitrant water supplier to comply with applicable state law or regulation (water quality, water quantity, level of water service)
- In certain instances, use administrative enforcement cases to compel other water users to comply with regulations, or alternatively, cause the TCEQ to begin and prosecute the enforcement action
- Get involved in the water planning process with local GCDs and regional water planning groups in order to affect the amount of water available for permitting
- Challenge a GCD's Desired Future Conditions
- Participate in the GCD formation process and affect the substance of their water use regulations and management plan

C. Trial

Some conflicts over water rights, use and management will require full-blown fights in civil trials. These may include:

- Forcing a GCD or the TCEQ to follow state law
- Preventing an unconstitutional taking of a water right (water rights are a property right)
- Requiring a regulator to pay full fair market value for taking a water right (or restricting a water right)
- prosecuting inverse takings actions

VIII. CONCLUSION

Statistically speaking, one out of every one human beings requires water for survival. This is why water's for fightin', while whiskey is merely for drinking. In Texas we rely on a combined system of government and quasi-public entities to provide continuous and adequate, affordable water. As water resources continue to be stretched to their limits by an increasing population, one can reasonably expect more governmental planning and regulation, more frequent intersections between private rights and public need, and more governmental delegation of authority, power and responsibility to the quasi-public sector to assist in

meeting state water needs. All of these actions affect water rights and can be expected to generate more fights about those rights. As inspired by that philosophical band The Beastie Boys, "you gotta fight, for your right, to wah-ter." Welcome to the party, North Texas.

For more information about water rights, case law and regulatory developments as they occur, please monitor my law firm's website:

and visit my firm's environmental website:

as well as the "mother ship":

END OF ARTICLE

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