HOUSE COMMITTEE ON NATURAL RESOURCES
TEXAS HOUSE OF REPRESENTATIVES
INTERIM REPORT 2010

A REPORT TO THE
HOUSE OF REPRESENTATIVES
82ND TEXAS LEGISLATURE

ALLAN B. RITTER
CHAIRMAN

COMMITTEE CLERK
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House Committee on Natural Resources

November 23, 2010

Allan B. Ritter
Chairman

P.O. Box 2910
Austin, Texas 78768-2910

The Honorable Joe Straus
Speaker, Texas House of Representatives
Members of the Texas House of Representatives
Texas State Capitol, Rm. 2W.13
Austin, Texas 78701

Dear Mr. Speaker and Fellow Members:

The House Committee on Natural Resources of the Eighty-First Legislature hereby submits its interim report including recommendations and drafted legislation for consideration by the Eighty-Second Legislature.

Respectfully submitted,

_____
Allan B. Ritter

William A. "Bill" Callegari	Frank J. Corte Jr.
Brandon Creighton	Trey Martinez Fischer
Stephen Frost	Tracy O. King
Jodie Laubenberg	Eddie Lucio III
Doug Miller	John T. Smithee

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HOUSE COMMITTEE ON NATURAL RESOURCES

INTRODUCTION

At the beginning of the 81st Legislature, the Honorable Joe Straus, Speaker of the Texas House of Representatives, appointed eleven members to the House Committee on Natural Resources (the "committee"). The committee membership included the following: Representatives Allan B. Ritter (Chairman), William A. "Bill" Callegari (Vice-Chairman), Frank J. Corte Jr., Brandon Creighton, Trey Martinez Fischer, Stephen Frost, Tracy O. King, Jodie Laubenberg, Eddie Lucio III, Doug Miller and John T. Smithee.

During the interim, the committee was assigned five charges by the Speaker:

1. Evaluate groundwater regulations and permitting processes throughout the state, including the role of state agencies in groundwater management, the development of desired future conditions, and the adoption of groundwater management plans in relation to regional and state water planning.

2. Monitor the effects of current and proposed federal initiatives that could impact the implementation of the State Water Plan. Evaluate the policies and investments developed by other states dealing with water issues similar to the State of Texas.

3. Monitor ongoing drought conditions and initiatives to promote water conservation through the review of the following: state requirements for the submittal of water conservation plans and annual reporting; the "trigger" for use of drought contingency plans; recommendations by state agencies and the Water Conservation Advisory Council; and progress toward the development of recycled water resources and desalination projects.

4. Evaluate the regulatory model for investor-owned water and sewer utilities, including rate case process and timing, consultant fee recovery, overall cost reductions and more effective consumer participation.

5. Monitor the agencies and programs under the committee's jurisdiction.

The committee has completed its hearings and investigations and has issued the following final report and recommendations. All interim charges including the charge monitor the agencies and programs under the committee's jurisdiction were undertaken by the committee as a whole and no subcommittees were appointed.

Finally, the committee wishes to express appreciation to the federal and state agencies, local governments, public and private interests, and concerned citizens who testified at the public hearings for their time and efforts on behalf of the committee.

INTERIM STUDY CHARGES

Committee of the Whole

CHARGE #1: Evaluate groundwater regulations and permitting processes throughout the state, including the role of state agencies in groundwater management, the development of desired future conditions, and the adoption of groundwater management plans in relation to regional and state water planning.

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Committee of the Whole

CHARGE #2: Monitor the effects of current and proposed federal initiatives that could impact the implementation of the State Water Plan. Evaluate the policies and investments developed by other states dealing with water issues similar to the State of Texas.

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Committee of the Whole

CHARGE #3: Monitor ongoing drought conditions and initiatives to promote water conservation through the review of the following: state requirements for the submittal of water conservation plans and annual reporting; the "trigger" for use of drought contingency plans; recommendations by state agencies and the Water Conservation Advisory Council; and progress toward the development of recycled water resources and desalination projects.

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Committee on the Whole

CHARGE #4: Evaluate the regulatory model for investor-owned water and sewer utilities, including rate case process and timing, consultant fee recovery, overall cost reductions, and more effective consumer participation.

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GROUNDWATER

PUBLIC HEARING

The House Committee on Natural Resources held a public hearing on its Interim Charge #1 related to groundwater on April 15, 2010 at 9:00 a.m. in Austin, Texas in the Capitol Extension, Room E2.010. The following individuals testified on the charge:

Andrew Backus, Hays Trinity Groundwater Conservation District
Bradley Barnard, Self
Cary Betz, Texas Commission on Environmental Quality
Carolyn Brittin, Texas Water Development Board
Linda Brookins, Texas Commission on Environmental Quality
Raymond Buck, Upper Guadalupe River Authority
Luana Buckner, Edwards Aquifer Authority
Jon Budd, Self and Coalition of Concerned Citizens Opposed to the Edwards Aquifer Authority
Tina Buford, Texas Wildlife Association- President
Jim Conkwright, High Plains Underground Water Conservation District No. 1
Joe Cooper, Middle Trinity Groundwater Conservation District
Anthony Corbett, Upper Guadalupe River Authority
Karl Dreher, Edwards Aquifer Authority
Ronald G. Fieseler, Blanco-Pedernales Groundwater Conservation District
Clint Gardner, Self
Horace Grace, GCDs & GMA 8
Robert Gulley, Edwards Aquifer Recovery Imp Program
Janet Guthrie, Hemphill County Underground Water Conservation District
Kirk Holland, Barton Springs/Edwards Aquifer Conservation District
Dewey Hukill, Self and Texas Farm Bureau
Russell Johnson, Self
Kathy Jones, Lone Star Groundwater Conservation District
Marvin Jones, Mesa Water, L.P.
Joel Katz, End Op, LP
Robert Mace, Texas Water Development Board
Ed McCarthy, Self
Kelly Mills, Texas Commission on Environmental Quality
Ken Petersen, Texas Water Development Board
Robert Puente, San Antonio Water System
LG Raun, TX Rice Producers Legislative Group
Caroline Runge, Menard County Underground Water Conservation District, Hickory Underground Water Conservation District No.1
Dave Scott, Texas & Southwestern Cattle Raisers Assoc.
Rodney Smith, Southwest Texas Water Resources LP
Michael Thornhill, End Op, LP
Gary Westbrook, Post Oak Savannah Groundwater Conservation District
C.E. Williams, Panhandle Underground Water Cons. District

The following section of this report related to groundwater is produced in large part from the oral and written testimony of the individuals listed above.

INTRODUCTION

The committee was charged with the oversight of groundwater management and protection of groundwater resources through local, regional, and statewide planning procedures. Although technologies have advanced our knowledge, groundwater management in the State of Texas has become increasingly more difficult because of a growing demand and scarcer resources.

Texas law recognizes a landowner's interest in and right to use groundwater in some form under a modified "Rule of Capture." Since 1949, Texas has continued to develop a uniquely tailored system for the management and protection of groundwater resources locally through groundwater conservation districts ("GCDs"), otherwise referred to in this report as districts. Today, this system not only includes local districts but also groundwater management areas ("GMAs"), which together are working to provide information for Regional Water Planning Groups ("RWPGs") and, ultimately, the State Water Plan through a process known as desired future conditions ("DFCs"). As each GMA adopts and the Texas Water Development Board (the "TWDB") receives these DFCs, we gain more and more insight into how the process is working.

BACKGROUND

The state's statutory management over GCDs is contained in Chapter 36 of the Texas Water Code ("TWC"). The first GCD, High Plains Underground Water Conservation District, was created by law in 1949 and formed in 1951.[1] Almost 40 years later in 1988, 23 GCDs existed.[2] Ten years later, the number of GCDs had near doubled to 44.[3] As of this year, the state has 98 GCDs established by law.[4]

Overview of Texas Groundwater Law[5]

Since 1904, Texas has followed the Rule of Capture and the Rule of Absolute Ownership. In *Houston and Texas Central Railroad Company v. East*,[6] the Texas Supreme Court adopted the "Rule of Absolute Ownership" from the English case of *Acton v. Blundell,*[7] and concluded that the owner of the surface had the right to dig and to capture the water from beneath his property, even if it adversely affected his neighbor.[8] The Court's ruling in *East* involved both property rights and tort law concepts. Specifically, the Court's decision was based upon the principle that a surface owner owns the groundwater beneath his property and that the owner can produce that water even if it adversely impacts his neighbor.[9] Following *East*, when exercising the property rights associated with the production of groundwater subject to certain express limitations involving waste, negligence, and subsidence,[10] a landowner was not subject to any tort liability for damages incurred by neighboring landowners that flow directly or indirectly from the exercise of those property rights.[11]

In 1917, Texas citizens adopted what has come to be known as the Conservation Amendment to the Texas Constitution.[12] This amendment, codified as Section 59 to Article

XVI of the Constitution, declared that the conservation of the state's natural resources, including water, to be a public right and duty, and imposed the obligation upon the state legislature for the implementation of that policy. Pursuant to the amendment, the legislature was empowered to pass all laws necessary to protect, enhance and preserve natural resources of the state, including its groundwater.[13]

In 1927, the Texas Supreme Court clarified that property rights in groundwater are associated with the ownership of the surface of the land. In *Texas Company v. Burkett*,[14] the Supreme Court recognized that the ordinary percolating waters are the "exclusive property of the owner of the surface."[15] The Court also concluded that there was no restriction against the sale of percolating waters for industrial use off of the land from which the groundwater was produced. The Court held that there was a presumption that the source of the water produced was groundwater.

Almost a quarter of a century after *Burkett*, in *City of Corpus Christi v. City of Pleasanton*,[16] the Supreme Court again considered the question of a landowner's rights in the groundwater produced from wells on the landowner's property. While the Court was focused on whether or not the transport of groundwater down the bed and banks of a state owned watercourse constituted "waste," the Court concluded that the alleged significant losses that occurred during the transport between the point of pumping the groundwater and the point of use was necessary to achieve the intended beneficial use of the water.[17] In the course of its opinion, the Court reaffirmed the Rule of the Capture it had established in the *East* case[18] and the attendant ownership interests of the landowner in the groundwater articulated in *Burkett*.[19] The Court went further and concluded that at common law there was no "limitation of the means of transporting the groundwater to the place of use."[20] The Court also admonished the legislature that the duty to implement the public policy found in the Conservation Amendment did not belong to the Courts but was conferred "exclusively to the legislative branch of government."[21] The Supreme Court's opinion in *Corpus Christi* modified its ruling in *East* insofar as it recognized that "waste" was a limitation upon the right of the surface owner to use groundwater produced from beneath its property.

In 1949, the legislature took its first actions to enact groundwater legislation and create GCDs pursuant to the Conservation Amendment.[22] In the early years GCDs were created to address specific known problems related to the production of groundwater. For example, in the Texas Panhandle region, several districts were created to address the identified mining of the Ogallala Aquifer which was significantly depleted due to historic pumping for irrigation and severely limited recharge characteristics. In the 1970s, subsidence within the state's gulf coast region around the City of Houston resulted in the creation of what is now the Harris-Galveston Subsidence District.[23] During the interim between the adoption of the Conservation Amendment and the creation of the first GCD, subsidence district, and the Edwards Aquifer Authority, Texas courts continued to follow both the Rule of Capture and the Rule of Absolute Ownership adopted by the Texas Supreme Court in the *East* case.

Landowners' rights related to the ownership of the groundwater were further refined in 1954, by the El Paso Court of Appeals in what is commonly known as the *Comanche Springs* case.[24] At issue in *Comanche Springs* was a complaint by surface water rights holders

downstream of Comanche Springs that groundwater pumped for irrigation in Fort Stockton was causing the springs to stop flowing thereby impacting the availability of water for diversion pursuant to their surface water rights permits. Despite complaints by the downstream water rights permittees, including a water control and improvement district, of harm based upon the alleged loss of water for irrigation supply from the spring flows of Comanche Springs, the court upheld the landowners' rights to pump the groundwater for beneficial use notwithstanding the detriment to adjacent and/or downstream landowners. In making its ruling, the El Paso Court relied upon the Supreme Court's ruling in *Burkett* that the surface landowner had the absolute ownership of the water beneath his land.[25] The El Paso Court further held that there were no "correlative rights" in the groundwater for the benefit of downstream landowners.[26]

In 1978, the Supreme Court limited the unbridled right of a landowner under the Rule of Capture to produce groundwater from beneath his property. In *Friendswood Development Co. v. Smith-Southwest Indus., Inc.*,[27] the Court held that a landowner was prohibited from negligently pumping groundwater in a manner that would cause subsidence.[28] The Court's ruling, which was expressly made prospective in its application, had no effect on the proposition that the landowner owned the groundwater beneath his property. The Absolute Ownership Doctrine continued to be the rule of the land in Texas. Moreover, the Supreme Court expressly held, as the El Paso Court had in the *Comanche Springs* case that in Texas there are no correlative rights in groundwater.

Approximately ten years later, the Austin Court of Appeals reconfirmed the sweeping application of both the Rule of Capture and the Rule of Absolute Ownership as developed in the lineage of the Supreme Court's rulings in the *East*, *Burkett, Corpus Christi* and *Friendswood* cases.[29] In *Denis v. Kickapoo Land Co.*,[30] the Austin Court of Appeals upheld a landowner's right to capture groundwater before it reached the surface at a spring opening and, thereafter, to flow the same downstream to a place of beneficial use. The Austin Court observed that "[w]hen squarely faced with the issue, the Supreme Court has consistently adhered to the English Rule [of Absolute Ownership]." [31]

In *Sipriano v. Great Spring Waters of America,*[32] the Supreme Court was confronted with a direct challenge to the continued reliance upon the Rule of Capture in Texas. Landowners filed suit for damages alleging that Ozarka, which installed wells to support a bottling plant that produced approximately 90,000 gallons of water a day seven days a week, had negligently drained their groundwater. The trial court granted summary judgment for Ozarka on the basis of the Rule of Capture. In doing so, the court reiterated the position it had taken in 1955: "By constitutional amendment, Texas voters made groundwater regulation a duty of the Legislature."[33] The Court also acknowledged the legislature's position that "groundwater conservation districts . . . are the state's preferred method of groundwater management."[34]

An amendment to Section 36.002 of TWC in 2001 purported to modify the state's policy on ownership of groundwater to further empower groundwater districts:

> The ownership and rights of the owners of the land . . . in groundwater are hereby recognized, and nothing in this Code shall be construed as depriving or divesting

the owners . . . of the ownership or rights, except as those rights may be limited or altered by rules promulgated by a [groundwater] district.[35]

During the 79th Regular Session in 2005, House Bill 1763 relating to the notice, hearing, rulemaking, and permitting procedures for GCDs was passed amending Chapter 36 of the TWC to establish procedural requirements that districts must use for rulemaking and permitting.[36] The bill also amended Chapters 16 and 36 of the TWC, to strengthen requirements for joint planning by districts overlying the same aquifer(s), as well as attempt to provide more consistent groundwater management by districts within the same management area. For example, GCDs within the same management area are required to jointly establish the DFCs of the aquifers they regulate and to adopt management plans that contain goals and objectives consistent with achieving those conditions.[37]

The Supreme Court is currently considering the ownership issue in the *Edwards Aquifer Authority v. Day* case and is reviewing the nature of the property right a landowner has in the groundwater beneath his property, the Rule of Capture (including its true tort-based characteristics), and the lawful exercise by GCDs of the police powers granted to them to regulate the landowner's vested property right in groundwater consistent with the Conservation Amendment[38] and Chapter 36 of TWC.

Irrespective of how the Texas Supreme Court decides the issue of groundwater as a property right, the Court has acknowledged that GCDs have been declared by the Texas legislature to be the state's "preferred method of groundwater regulation,"[39] and that it is the legislature's duty – not the Court's – to exercise the state's police powers and enact laws to facilitate the preservation and conservation of groundwater as a natural resource within the state as well as prevent its waste and provide for its maximum beneficial use.[40]

Management of groundwater by districts is not unfettered. The creation of the existing groundwater management scheme does not relieve the legislature of its constitutionally mandated responsibilities with respect to groundwater. Those responsibilities include, when appropriate, restructuring groundwater regulation. The goal should be to achieve the best management of the affected aquifer(s) to facilitate the maximum beneficial use of the groundwater resources within the State.

Agency Oversight/ Statutory Regulation over Groundwater

Texas Water Development Board

The TWDB adopts rules and procedures for groundwater management.[41] In general, the TWDB's role in the regional and state water planning process includes: reviewing regional water plans in accordance with agency rules and guidelines; resolving interregional conflicts; approving regional plans; developing state water plan; and providing funding for strategy implementation.

In 1997, the legislature passed Senate Bill 1 which requires a statewide water planning process whereby 16 regional water planning groups prepare for a 50-year planning horizon

considering the record of drought and all water user categories on a five-year cycle.[42] This regional water planning process takes into account projected population and water demands while assessing existing/ future water supply demands. Once the demands and supplies are compared, needs for future use are identified and water management strategies are recommended for the adoption of regional plans and further implementation of the statewide water plan. Prior to 2005, groundwater availability was determined by regional water planning groups that only had to consider information in a management plan developed by a GCD. Additionally, Senate Bill 2 required the TWDB to provide "reliable, timely data on groundwater availability" in the form of groundwater availability modeling ("GAM").[43]

Texas Water Development Board's Role with the Desired Future Conditions Process

In 2005, the 79th Legislature adopted House Bill 1763 requiring groundwater availability to be determined through a bottom-up process starting with the creation of DFCs. The development of the DFCs process fundamentally changed groundwater management in Texas allowing for both policy and science to determine the use of groundwater availability in regional and statewide water planning.[44]

In a joint planning process, 16 GMAs are required to determine individual DFCs which are then approved by the TWDB. From the DFCs, the TWDB produces the managed available groundwater ("MAG") values delineated by major/ minor aquifers, GCDs, RWPGs, counties, and river basins. MAG values define the amount of water that may be permitted by a district for beneficial use in accordance with the DFCs. Additionally, the RWPGs must consider the MAG values in conjunction with GCD management plans.[45] The first set of DFCs was required to be submitted to the TWDB before September 1, 2010, and thereafter, every five years.[46] RWPGs are required to include the DFCs information in their water plans if districts have adopted DFCs before January 1, 2008. After this date, it is optional for planning groups to include the DFCs information. Regional water plans and the State Water Plan for 2016 and 2017, respectively, will include all of the available DFCs information.[47]

The TWDB regulations define a Groundwater Management Area ("GMA") as an area designated and delineated by the TWDB as suitable for the management of groundwater resources. Each GMA is required by September 1, 2010, to establish the DFCs for each aquifer subject to regulation within the GMA. Each aquifer may have separate DFCs. The DFCs must be adopted by a two-thirds vote of the district members at the GMA meeting. Chapter 36 of TWC defines the term "managed available groundwater" as "the amount of water that may be permitted by a district for beneficial use in accordance with the desired future condition of the aquifer as determined under Section 36.108."[48] The TWDB has adopted a slightly different definition in its regulations, and defines the MAG to be "the amount of water that may be permitted by a district for beneficial use in accordance with the desired future condition of the aquifer."[49]

The petition process for DFCs allows "a person with a legally defined interest in groundwater, a GCD in or adjacent to the GMA, or a RWPG in the GMA to file a petition with the TWDB appealing the approval of the DFCs. The petition must include evidence that the districts did not establish reasonable DFCs. Petitions can also be filed with the Texas

Commission on Environmental Quality (the "TCEQ") concerning rules adopted by GCDs and the enforcement of those rules related to the DFCs."[50]

The TWDB provides technical and administrative assistance in the adoption of the DFCs and the production of MAG values. The TWDB develops GAM and MAG values, in addition to providing other technical and scientific assistance to GCDs, GMAs, and RWPG. The TWDB also conducts administrative reviews of the DFCs submissions and considers the DFCs petitions, holding public hearings and assessing reasonableness.[51]

Status Update for Groundwater Management Areas[52]

On April 15, 2010, the committee heard testimony from the TWDB concerning the status of joint planning. Since September 1, 2005, 15 of the 16 GMAs have held over 176 combined joint planning meetings. As of March 2010, DFCs have been adopted in three GMAs as follows:

- GMA 1 adopted DFCs for Ogallala and Rita Blanca aquifers;
- GMA 8 adopted DFCs for the Edwards (Balcones Fault Zone), Brazos River Alluvium, Nacatoch, Blossom, Woodbine, Trinity, Ellenburger-San Saba, Hickory, and Marble Falls aquifers; and
- GMA 9 adopted DFCs for Ellenburger-San Saba, Hickory, Marble Falls, and the Edwards Group of the Edwards-Trinity (Plateau) aquifers.

The TWDB has received petitions for three of the GMAs which have adopted DFCs. GMA 1 received two petitions; GMA 8 received one petition; and GMA 9 received three petitions. The petitions have been resolved as follows:

- The DFCs established by GMA 1 were determined "not unreasonable" by the TWDB;
- The petition received against GMA 8 was dismissed by the TWDB because it was not received within the allotted petition period; and
- At least one of DFCs established by GMA 9 was determined "unreasonable" by the TWDB because it was physically impossible to obtain considering exempt uses.

Overall, districts have adopted DFCs for 15 aquifers in 3 GMAs. The TWDB has provided MAG values for all of the aquifers in GMA 8 (except for the Nacatoch) and in GMA 9 for the Edwards Group of the Edwards-Trinity Aquifer, although these MAG values may change depending on the outcome of the petition. Additionally, the TWDB has produced 83 GAM runs in contribution to the GMA joint planning process.

Regional Planning Process[53]

The TWDB's role in the RWPG process is fourfold: review regional water plans in accordance with agency rules and guidelines and resolve interregional conflicts; approve RWPG

plans; develop the State Water Plan; and provide funding for strategy implementation. The RWPG process includes the following:

- quantify current and projected population and water demand;
- valuate and quantify existing and future water supplies;
- identify surpluses and needs;
- evaluate and recommend water management strategies
- make regulatory, administrative, and legislative policy recommendations; and adopt the plan, with the required level of public participation.

Water management strategies include conservation, new surface water/ groundwater development, water reuse, improved management of existing supplies, desalination, conveyance, and renewal of contracts. RWPGs have been diligently meeting and developing strategies to meet their regional needs. As of the date of this report, ten regional water plans have been adopted for the 2012 State Water Plan cycle.

Texas Commission on Environmental Quality[54]

The TCEQ's statutory management over GCDs is contained in Title 30, Part 1, Chapter 293 of the Texas Administrative Code ("TAC").

Texas Commission on Environmental Quality's Role with the Desired Future Conditions Process

The joint planning process requires the GMAs/ GCDs to adopt DFCs and to submit the DFCs to the TWDB by September 1, 2010.[55] If challenged by petition, the TWDB is authorized to determine if the DFCs are reasonable.[56] The TCEQ is not currently involved in the DFCs decisions.

The TCEQ is authorized for oversight of GCDs specifically relating to groundwater management plans and joint planning in common GMAs. In accordance with Chapter 36 of TWC, the TCEQ is responsible for GCD management plan noncompliance review and compliance enforcement. The TCEQ rules applicable to agency noncompliance review and enforcement procedures regarding GCD management plans are contained in Title 30, Section 293.22 of the TAC, and the rules regarding the joint management planning inquiry/ review group process authorized under Section 36.108(f) – (k) of the TWC are contained in Title 30, Section 293.23 of the TAC.

Texas Commission on Environmental Quality's Role with Groundwater Management Areas

The TCEQ is responsible for enforcing GCDs management plan adoption, approval, and implementation, and implementation of the GMA's joint planning goals. The agency is actively monitoring and ensuring GCD compliance to meet management plan adoption and re-adoption requirements. The TCEQ dissolved one GCD in 2009 for violating these provisions. With regard to GCD implementation of the first cycle of GMA planning, the TCEQ has rules in place

to consider petitions that challenge a GCD's participation in the process or the adequacy or enforcement of a GCD's rules to achieve the GMA DFCs. It is anticipated that the first application of these rules may be exercised over the next biennium.

After the TWDB determines the MAG volumes, each GCD must reconsider its existing management plan, coordinate with surface water management entities on a regional basis, and consider the water supply needs and management strategies in the adopted State Water Plan. The RWPGs must also use the MAG volumes in their subsequent planning cycle. Surface water rights applications to TCEQ must contain information that describes how the application addresses a water supply need in a manner that is consistent with the State Water Plan or the applicable regional water plan or, alternatively, the application must describe conditions that warrant a waiver.

Additionally, Section 36.108 of TWC provides that a person with a legally defined interest in the groundwater within the management area also may file a petition with the TCEQ requesting an inquiry if a district or districts refused to join in the planning process or the process failed to result in adequate planning, including the establishment of reasonable future desired conditions of the aquifers.[57] The petition must provide evidence of the following:

1. A district in the GMA has failed to adopt rules;
2. The rules adopted by a district are not designed to achieve the DFCs of the groundwater resources in the GMA established during the joint planning process;
3. The groundwater in the management area is not adequately protected by the rules adopted by a district; or
4. The groundwater in the GMA is not adequately protected due to the failure of a district to enforce substantial compliance with its rules.

Then, not later than the 90th day after the date the petition is filed, the TCEQ must review the petition and either dismiss the petition if the TCEQ finds that the evidence is not adequate to show that any of the conditions alleged in the petition exist or select a review panel as provided in Section 36.108(h) of the TWC.[58] Not later than the 120th day after appointment, the review panel shall review the petition and any evidence relevant to the petition and, in a public meeting, consider and adopt a report to be submitted to the TCEQ.[59] The review panel may attempt to negotiate a settlement or otherwise resolve the dispute.[60] If unsuccessful in reaching a resolution, the panel must file a report with the TCEQ.[61] Upon receipt of the report, the TCEQ may take action under Section 36.3011, TWC.[62] Not later than the 45th day after receiving the report, the Executive Director or the TCEQ shall take action to implement any or all of the panel's recommendations. The Commission may take any action against a district it considers necessary in accordance with Section 36.303 if it finds any of the following:

1. A district has failed to submit its plan to the executive administrator;
2. A district has failed to adopt rules;
3. The rules adopted by the district are not designed to achieve the desired future condition of the groundwater resources in the groundwater management area; or

4. The groundwater in the management area is not adequately protected by the rules adopted by the district, or the groundwater in the management area is not adequately protected because of the district's failure to enforce substantial compliance with its rules.[63]

TCEQ is also responsible for delineating and designating priority groundwater management areas ("PGMAs") and creating GCDs in response to landowner petitions or through the PGMA process. The TCEQ is presently tracking and pursuing GCD creation in the designated PGMAs. The creation of new GCDs, the status and result of actions in the PGMAs, and GCD management planning and agency-required interactions will be reported to the 82nd Texas Legislature in coordination with the TWDB through the *Priority Groundwater Management Areas and Groundwater Conservation Districts* report to the legislature. This report is due no later than January 31st of each odd-numbered year.

Status Update for Priority Groundwater Management Areas[64]

A PGMA is an area designated and delineated by the TCEQ that is experiencing or is expected to experience, 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.

Areas with groundwater concerns are identified by the TCEQ, and the TWDB and the Executive Director of the TCEQ determine when to initiate a new study. Initial input is solicited from water stakeholders and local governments. Additionally, studies and information are requested from and provided by the TWDB, Texas Parks and Wildlife Department, and Texas Department of Agriculture. The Executive Director of the TCEQ completes a report on the area, including summarized written comments and new information provided by stakeholders, which includes a recommendation for or against designating all or part of the area as a PGMA and a recommendation for groundwater management by creation of a GCD.

If the area is recommended for designation as a PGMA, a State Office of Administrative Hearings contested case hearing is held, parties are allowed to enter evidence for consideration, and the hearing judge presents a proposal for decision to the TCEQ on the PGMA designation and GCD creation recommendation. At Agenda, the TCEQ determines, via an Order, whether the area will be designated as a PGMA and makes a recommendation on GCD creation.

The date of the PGMA designation Order issued after September 1, 2001, starts a two-year time frame for local action to establish a GCD through special law or petition processes. If a locally initiated GCD is not established in two years, the TCEQ then either creates a GCD on its own motion or makes a recommendation to the legislature for groundwater management in the PGMA.

The TCEQ performs the PGMA evaluations and makes recommendations on PGMA designation and GCD creation. To date, the TCEQ has designated seven PGMAs that include all or part of 35 counties. The designation of the PGMAs has encouraged local initiative to establish 18 GCDs to address groundwater management in most of the designated areas. Either

locally initiated or the TCEQ directed GCD creation actions are still needed to address groundwater management for all or part of nine counties in the designated PGMAs.

Status Update for the Edwards Aquifer Authority and Edwards Aquifer Recovery Implementation Program

At the April 15th, 2010 hearing on groundwater, Luana Bucker, Chairman of the Edwards Aquifer Authority (the "EAA"), gave testimony on updates of the EAA. She reported that the EAA was moving forward under its authority to manage groundwater in the region and that public hearings continue to be well attended. Additionally, she commented that the EAA believes that property rights are being protected through their current permitting process. Although, the TWC could use further clarification in certain areas such as the determination of exempt use and whether MAG numbers are more reflective of planning or regulatory numbers.[65]

Robert Gulley, Program Manager of the Edwards Aquifer Recovery Implementation Program (the "EARIP"), was also in attendance to testify on its progress. In 2007, the EARIP was created to federally protect enlisted endangered species associated with the Comal springs. The EARIP has been working diligently to come up with a plan to meet the 2012 goals for endangered species. This plan must be approved by the United States Fish and Wildlife Service, so it is likely to be submitted by in the late summer or early fall of 2011. The EARIP is conducting public hearings to discuss environmental impacts and receive stakeholder input.[66]

DISCUSSION AND CHALLENGES

Groundwater Management and the Desired Future Conditions Planning Process[67]

Effective groundwater management and regulation should respect landowner rights, protect the long term use of the resource, and ensure the state has sufficient water supplies to meet its existing and future needs. Currently, GCDs are empowered under Section 36.116 of the TWC to regulate the production of groundwater using essentially two methods: well spacing setbacks and production limits based upon acreage owned or served. Both mechanisms recognize the ownership rights of all landowners by managing production based upon impact. GCDs are also given the authority to establish new and more restrictive permit conditions on new users should circumstances so require, so long as those restrictions are placed on all future new users. The powers outlined by the legislature strike the a balance between protection of the resource and recognition of ownership rights.

At the hearing on April 15th, several challenges were presented which related to the DFCs planning process including the subjectivity of determining DFCs, the limitation of overall production in aquifers, and the prevention of exporting groundwater. DFCs based upon remaining available supply inherently express a substantive judgment concerning the appropriate rate of use of a declining supply. DFCs based upon drawdown are likewise arbitrary, particularly when drawdown is calculated on an average basis. Given no framework

for considering the balance to be struck between water available for use and the desire to reduce the impact of future use, districts are predisposed to establishing DFCs which will minimize impacts, often placing available groundwater off-limits for future production. In addition, many districts are achieving their desired goals by selecting preliminary DFCs, having the TWDB run their GAMs, and obtaining MAG results to determine if the DFCs meet their goal. In this instance, a DFC is selected and sent to the TWDB for analysis. If the MAG value generated by the TWDB is particularly large or "too high," districts then select a more conservative DFCs which result in the calculation of much lower MAG number. In short, many districts are backing into the process by selecting MAG numbers and not DFCs.

Additionally, GCDs are applying the language of Chapter 36 to mean that they cannot permit or authorize production in excess of the calculated MAG in the planning process. This results in allocation decisions by the district in determining who and how much groundwater can be produced, placing billions of acre-feet of available groundwater off-limits to future production. The TWDB estimates that there is approximately 7 billion acre-feet of groundwater stored in the groundwater formations in the State of Texas. The Carrizo-Wilcox Aquifer is estimated to contain a billion acre-feet of stored groundwater. The Simsboro Member of the Carrizo-Wilcox formation in six counties northeast of Austin is estimated to have over 200 million acre-feet of available groundwater. Even where groundwater supplies are known to be declining in place like El Paso, Lubbock, and Amarillo, projections for the next 50 years suggest sufficient supplies.

These numbers and the impact of placing available supplies off-limits for planning purposes for the next 50 years is inherent in the conservative nature of the decisions forced upon GCDs. To minimize impacts, many GCDs will choose the conservative approach of maintaining aquifer conditions at or near current conditions or minimizing declines in aquifer levels or drawdown. Access to future supplies is denied at a time when the Texas economy can least afford to be short of available water supplies.

Finally, Senate Bill 2 struck careful balance that allowed GCDs to manage groundwater resources but prevented them from managing them to prevent exports. Section 36.122 of the TWC allows districts to require transport permits for groundwater exported but prevents export prohibitions. The legislature recognized the vital importance of moving water from where it is located to where it is needed to supply economic development. However, there exists concern that GCDs are currently selecting DFCs that will protect existing local use and projected future local use while not leaving room for any additional production or exportation in the future.[68]

Joint Planning Process and its Role in the Regional Water Planning Process

Groundwater management goals are as diverse as the aquifers, geographic areas, and groundwater users in our state.[69] Moreover, GCDs in Texas are not required to be formed along the lines of aquifers.[70] Most commonly they are formed along political boundaries, i.e. county lines.[71] In fact 59 of the 98 district boundaries across the state were formed as “single county” districts.[72] As aquifers do not recognize political boundaries and in an effort to avoid inconsistent planning and regulatory programs by multiple GCDs overlying the same aquifer(s),

the legislature mandated joint planning activities by districts with regulatory jurisdiction over the common aquifer(s).[73]

The joint planning process provides for great diversity both within districts and between districts, of hydrologic factors, climatic variability, population density, and groundwater management philosophies and methodologies. This process was created to determine how much water should be withdrawn while protecting the viability of our aquifers and conserving water for the future. It was also created to ensure the management of the GCDs complimented each other. While science and data certainly play a role in establishing DFCs, the process is not purely science. It is a management goal that is established taking science and many other factors into consideration including future water needs, water quality, existing use, etc.

Many believe that the system currently in place in Texas works well because it blends the work of each district and GMA into the regional water planning process, and ultimately the State Water Plan. The process puts initial responsibility where it belongs with the district, whose board is responsible to its constituency. From the districts, the process moves to GMAs for broader management over an aquifer. Then, the process moves to the RWPGs furthering the input of water user interests representative of the defined regions. The current joint planning process exemplifies the idea that "one size does not fit all" when it comes to groundwater management in Texas.[74]

Moreover, each aquifer is as unique as the community that depends on that aquifer, and multiple aquifers complicate matters even farther. Functional, fully enabled, fully funded local GCDs are the best possible way to address all these differences. Some believe that the aquifer as a whole can be well managed through the joint planning and DFCs processes, assuming individual districts are functional. The process brings the issue of groundwater resources to the citizens' awareness and forces them to make conscious decisions about their desires for the future management of that resource given the facts as they are understood at the time. As citizens are exposed to the science they become more aware of how the aquifers are interconnected, their probable limitations, whether their aquifer is renewable or non-renewable, and how surface/ groundwater are interconnected in their area. As the understanding of the resources change, the management plan is changed, and so forth and so one until the aquifer system is completely understood.[75]

One perceived challenge to the joint planning process is the lack of an element addressing the future development of groundwater to meet population needs across the state. In order to meet the needs of our state and future economic growth as well as fulfill the vision of our statewide planning process, the development of future groundwater supplies should be factored into the joint planning process. The TWDB and RWPGs were charged through Senate Bill 1 with developing a comprehensive and coordinated State Water Plan to bring necessary water resources to their respective regions. However, through the current DFCs process, there is no formal relationship between the needs of the region and the joint planning process.[76]

Furthermore, unlike the regional water planning process which requires participation by all stakeholders in outlining the plans and strategies needed to meet the region’s 50-year water supply demands, the DFCs process is decided entirely by groundwater district representatives.

Although anyone is allowed to present public comments in the process, there is no other formal representation within the GMAs of entities that have a stake in groundwater development. Their decisions are reviewed only by groundwater district boards and are not subject to review by the state or any other stakeholder.[77]

Another challenge between the joint planning process and regional planning process relates to stakeholder participation at the GMA level. The RWPGs can and should be an important information resource for the GMA joint planning, especially in relaying ongoing projections of water demand, other supplies, and planned water management strategies.[78] The regional water planning process includes funding to perform necessary studies to gather accurate information about an aquifer and the potential impact of DFCs. The regional water planning process includes multiple stakeholders that ensures all stakeholders participate in the actual process and decision. Some feel that the DFCs process should be coordinated with, or made part of, the regional planning process to ensure greater stakeholder input, to prevent duplication of efforts, to allow for coordination between groundwater and surface water planning efforts, and to promote the most efficient use of limited financial and technical resources.[79]

On the other hand, a member of one GMA testified at the April 15, 2010 hearing on groundwater that GMAs provide a little bit of balance for Texas' agriculture and rural communities while necessarily keeping their attention on economic opportunities afforded by the sale of water outside their member GCDs. Unlike RWPG members, the GCDs that make up the joint planning process are governed by elected and appointed boards that have the overall economic interests of their districts at heart. Policy decisions made by the RWPGs are oriented towards demand issues, while the joint planning process is oriented towards supply issues which should remain as science-based as possible. This line of thought contends that the addition of voting stakeholders to GMAs would be a duplication of effort. The stakeholder process is adequately met by maintaining liaison between the GMAs and the RWPGs (i.e. three of the district managers in GMA 7 are also voting members of the Region F RWPG).[80]

A last challenge relating to the joint planning process and regional planning process is an issue of timing for the submission of DFCs. DFCs are currently due every 5 years at about the same time regional plans are due. Therefore, RWPGs are forced to use DFCs adopted by GMAs in the previous cycle. As long as these processes remain disconnected, the regions may submit plans for projects that are simultaneously cut off through the DFCs process. Should this happen, the TWDB then will be put in an awkward position of either approving a State Water Plan that cannot be fulfilled or else rejecting the plan, sending RWPGs back to the drawing board. Perhaps, a new staggered submission date should be considered to allow for the regional planning process to work in concert with the DFCs submissions.[81]

Agency Oversight/ Statutory Regulation over Groundwater

The lack of guidance for the development of DFCs, coupled with the lack of authority in the TWDB to implement and/or enforce its rulings on DFCs has also created numerous challenges. Initially, the first draft of House Bill 1763 gave the TWDB some regulatory oversight regarding unreasonable DFCs. The first round of rulemaking to implement the

legislation incorporated a final approval process for TWDB with respect to DFCs found to be unreasonable. However, after some debate about what the legislation intended, this language was removed. This left TWDB, as it stands today, with a purely advisory and support role. The legislature should consider whether or not the TWDB was intended to have a more meaningful role in the development of DFCs, especially given that the agency is charged with the State's Water Plan and groundwater resources play such an important role in the overall process.[82]

First, districts are given no framework for deciding appropriate DFCs.[83] Section 36.108 of the TWC requires the GMAs to develop their respective DFCs.[84] Unlike the MAG, however, the term DFCs is not defined in Chapter 36 of the TWC.[85] The lack of legislative guidance has been a substantial detriment to the process and has resulted in great liberty being taken by the TWDB in the development of its definition of "DFCs." The TWDB has defined the term as follows:

> (8) DFCs -- The desired, quantified condition of groundwater resources (such as water levels, water quality, spring flows, or volumes) for a specified aquifer within a management area at a specified time or times in the future, through at least the period that includes the current planning period for the development of regional water plans pursuant to Section 16.053 of the TWC, or in perpetuity, as defined by participating GCDs within a GMA as part of the joint planning process. DFCs have to be physically possible, individually and collectively, if different DFCs are stated for different geographic areas overlying an aquifer or subdivision of an aquifer.[86]

Desired Future Conditions Petitioning Process

Another challenge related to the DFCs process is the petitioning/ appeal process. Currently, once DFC are adopted by the GMA, it can be challenged by a person with a "legally defined interest."[87] Such a person is defined by TWDB regulations as follows:

> (17) Person with a legally defined interest in groundwater--A person who owns land or groundwater rights in the district, has a legal interest in a well in the district, has authorization from the district to produce groundwater, or otherwise has an interest in groundwater in the district as granted by court order or judgment.[88]

In addition to a person with a legally defined interest in the groundwater in the GMA, a district in or adjacent to the GMA, or a RWPG for a region in the GMA may file a petition with the TWDB appealing the approved DFCs.[89] The petition must provide evidence that the districts did not establish reasonable DFCs.[90] The TWDB must review the petition and relevant evidence, as well as conduct at least one hearing at a central location in the GMA to take testimony on the petition.[91] If the TWDB determines that the DFCs require revision, it must submit a report to the districts within the GMA that includes a list of findings and recommended revisions to DFCs.[92]

The TWDB has developed and published a series of guidance documents describing the process as follows:

1. TWDB, *How Is A Petition Filed To Appeal The Approval Of A Desired Future Condition of An Aquifer;*[93]
2. Flow Chart depicting the Desired Future Conditions "Appeal Process" (September 2009);[94]
3. Memorandum to TWDB to Board Members regarding "Procedures for Board Deliberations on Appeals of Desired Future Conditions" (January 13, 2010);[95]

In many respects, these publications reflect the agency's best guess at the process due to the limited guidance provided by the legislature.

Appeals from the GMA/ DFCs determinations are in their infancy. To date, the TWDB has considered two appeals from DFCs determined by GMA 1 and GMA 9.[96] On January 21, 2010, the TWDB considered the appeal of DFCs adopted by GMA 9 overlying the Texas Hill Country. Following the conclusion of the hearing, the TWDB declared the DFCs to be "unreasonable" because the desired future condition was "not achievable."[97] On February 17, 2010, the TWDB considered the appeal of DFCs adopted by GMA1 located in the Texas Panhandle. Following the conclusion of the hearing, the TWDB found the DFCs to be not "unreasonable."[98]

In response to a TWDB report finding the adopted DFCs are "not reasonable" and require revision, the affected district(s) must prepare a revised DFCs plan consistent with the TWDB's recommendations and, after notice, hold at least one public hearing at a central location in the GMA.[99] After considering all public and agency comments, the district(s) must revise the DFCs and submit the "revised" DFCs plan to the TWDB for review.[100] It is important to note that the revised DFCs may look a lot like the original DFCs. Currently, the TWDB interpretation of the statutes prescribing this process is that the DFCs process ends at this point, at least until the next round of joint planning by the GMA. In other words, the TWDB will not consider any appeal of revised DFCs, and there are no consequences to the affected GMA or its member groundwater districts. Overall, some believe that the appeal to the TWDB is not a meaningful review process. Worse, landowners have no legitimate legal remedy when adversely affected by these decisions. The appeal process is incredibly expensive and provides no real opportunity to examine or question the decision of local groundwater district in establishing desired future conditions.

Ultimately, the TWDB's interpretation, however, does not preclude an aggrieved landowner from pursuing relief at the courthouse. One such effort is currently under way as evidenced by the lawsuit filed by two affected landowners against the TWDB in the State District Court in Travis County, Texas, in response to the TWDB's finding that the DFCs were not "unreasonable." However, the courthouse route can be equally daunting given the language of Section 36.066(d) of TWC which mandates the award of attorneys' fees against a landowner in an unsuccessful lawsuit against a district.[101]

In conclusion, some districts believe that the DFCs petition time period of one year is too long. This petitioning process can delay the establishment of a final MAG number. The belief is that this should not be longer than four to six months.[102] Also, districts believe that there should be a more defined procedure for the petitioning process, especially with regard to the reasonableness of DFCs.[103]

Other Desired Future Conditions Issues

Funding and Resources for the Desired Future Conditions Process

The most significant obstacle that a district faces at its inception is are start-up funding which is very difficult for a fee-based district to achieve quickly.[104] The lack of adequate funding to study and/or regulate affected aquifers coupled with the existence of multiple groundwater districts with jurisdiction over the same aquifer(s) results in inconsistent as well as unsupported regulation of the same aquifer. The fact that many groundwater districts are located in agriculturally dependant rural areas with small populations creates a lack of reliable financing mechanism. This is due to an inadequate tax base and/or the reduced production fees assessable for irrigation wells which often represent the majority of the production within the groundwater district.[105]

Additionally, the current DFCs process does not provide for any funding to GMAs to conduct comprehensive technical evaluations required to adopt DFCs and determine their impact. In one case, the DFCs adopted by GMA 9 failed to account for projected exempt well use. Further, there is only one monitoring well in all of Kerr County. It was undisputed that the groundwater models had insufficient data for the MAG to be reliable. Thus, groundwater will be managed based on a MAG figure that is not reliable. Additional funding and resources are necessary to ensure the appropriate data is gathered for the MAG calculation to be accurate, otherwise, the DFCs may not be achieved and the aquifer may be improperly managed.[106]

Ultimately, a minimum level of authority and financing must be required when a GCD is created in order for the GCD to function.[107] Furthermore, districts believe that there should be funding for the joint planning process for both administrative and technical resources.[108]

Accuracy and Availability of Scientific Models

Models, by definition, are approximations of reality and, therefore, have uncertainties associated with them. Given the importance of MAG numbers to permitting, GCDs are concerned about the accuracy of the models, especially those for the minor aquifers. Accordingly, the TWDB has implemented multiple measures in its use of modeling including:

- Evaluation of the accuracy of the models before using them;
- Continuation of improvement of the models; and
- Encouragement of districts to manage adaptively.[109]

The largest challenge associated with the accuracy and availability of scientific models is related to expense. To date, millions of dollars have been spent on groundwater studies,

monitoring, and geoscientists. For example, the Lone Star GCD has invested significant funds to conduct or support studies and models of the Gulf Coast Aquifer within Montgomery County and to identify alternative water sources in the area to allow groundwater production to be reduced. The district has partnered with the TWDB, United States Geological Survey, and regional surface water providers, as well as employed its own professionals and engineering consultants from within the private sector to undertake these studies and analyze the results. Additionally, the district has commissioned GAM runs to assist it with developing its DFCs. The district has invested almost $2 million in aquifer characterization, modeling, and recharge studies to better understand the nature of the resources in the Gulf Coast Aquifer system, how the aquifer reacts to intense production, the level of sustainable production afforded by natural recharge, and the identification of alternative water sources in the area to allow groundwater production to be reduced.[110]

The next challenge to the use of scientific models, particularly in the DFCs process, is that GAMs do not answer the question of how much groundwater is available or can be sustainably produced. GAMs project impact of assumed production over time. All GAMs conducted by the TWDB in response to the set DFCs assume 100 percent pumping 100 percent of the time. This may be useful in determining the impact long term production might have, however, it does not mirror actual use or reflect pumping amounts which widely vary depending on weather and demand.[111] While the process was intended to be based on the science of the aquifer, most of the focus has been on particular pumping scenarios rather than the actual science of the aquifer. Some believe that this process can lead to decisions based solely on specific projects and the political controversy of the projects, rather than a scientifically based decision on the water resources.[112]

Finally, some districts remain at a disadvantage due to a lack of scientific data. For instance, GMA 7 has faced some serious deficiencies in the Edwards-Trinity GAMs and the total absence of GAMs for most of the minor aquifers. As of the date of the April 15th hearing: the Lipan Aquifer had a GAM and was pretty close to having its final GAM run; the Dockum and Ellenburger assessments had been reworked and received within the last few days.; and due to a very faulted sandstone aquifer, the Hickory had no GAM. As a consequence of GAM deficiencies, the Hickory district has spent $100,000 in the past two years on developing a structural model of the aquifer to help determine availability. In conclusion, more work is needed in order to determine volumetrics.[113]

Political Subdivisions and Geographic Area Language[114]

Another challenge related to the DFCs process involves the use of geographic language within statute that allows a district to divide an aquifer along political subdivision lines. Chapter 36, Section 108(d) of the TWC provides that "in establishing the DFCs of the aquifers under this section, the districts shall consider uses or conditions of an aquifer within the management area that differ substantially from one geographic area to another." In addition, districts may establish differing DFCs for … "each geographic area overlying an aquifer in whole or in part or subdivision of an aquifer within the boundaries of the management area." Coincidentally, these geographic areas are simultaneous with political subdivision lines, which some believe should not be contemplated as a basis for different DFCs. In addition, the fact that

"geographic area" is not a defined term in Chapter 36 presents challenges from a statutory, hydrological, and legal standpoint. Several stakeholders in the process would like to see "geographic area" either defined or struck from the statutory language all together. [115]

Conversely, proponents of geographic area language believe political subdivisions are valid boundaries for differing DFCs. An aquifer that covers a large area, such as the Trinity, will have different characteristics throughout the area. Some division is needed and division by a political boundary, such as a county, offers a reasonable approach.[116] Furthermore, these proponents believe that political subdivision boundaries represent existing regulatory and permitting systems (i.e. economic growth, property values, and tax rates all vary by county), and that significant private investments based upon those systems that have been around for years or even decades should not be ignored.[117]

Requirements to Permit up to the Managed Available Groundwater and Exempt Use

After the development of DFCs, the TWDB provides each district with a MAG. Some challenges remain in relation to permitting up to the MAG and, furthermore, whether exempt use should be included in the MAG. Currently, the TWC states that once a MAG value is established, the districts must permit "up to the MAG." Due to a lack of clarity in the statute, the intent of the language relating to the definition of the MAG has been the subject of different interpretations. Some interpret the MAG to be the minimum amount of water that a district can issue permits for in response to administratively complete applications filed with the district.[118] For example, districts are concerned with this mandatory requirement, believing that in some cases they will experience the equivalent of an "Oklahoma land rush" for the remaining available groundwater. They argue that it is conceivable that all the available groundwater could be allocated during the first year or two if there is a rush to obtain permits.[119] Others contend that the MAG represents the maximum amount of water available for permitting by the district.[120] It is the latter interpretation, which is consistent with the philosophy of minimizing the volume of groundwater to be permitted, that has created a lot of the consternation associated with the joint planning process.[121] Many GCDs read Section 36.1132 of the TWC as establishing a limit or cap on total permitted withdrawal.[122]

On a different note, some districts are not necessarily concerned with the issue of permitting "up to the MAG." At least one GCD is faced with something of an opposite challenge; in order for it to achieve its DFCs, it must reduce total production, exempt plus permitted, from its current unsustainable level down by about 30 percent to a level that can be sustained based on aquifer recharge rates. This district believes the overall intent of the DFCs process in Chapter 36 is clear: establish reasonable DFCs of the aquifer and then regulate production, considering both exempt and permitted use in order to achieve the DFCs. This district agrees, however, that this intent could be further clarified in the TWC.[123]

To complicate matters, current statutory language also leaves unclear whether "exempt use" is included in the definition of a MAG. By virtue of the term "managed" available groundwater, some believe that MAG values should only include water that is controlled or permitted by a district. On one hand, since exempt well usage is exempt from permitting, it should not be included in the MAG because the MAG is defined as the amount of water that

may be "managed" or permitted. The calculation and issuance of MAG figures that include projected exempt well usage may result in permits being issued by GCDs for water that is contemplated for exempt well usage.[124]

On the other hand, a MAG could be, on the basis of how it is established via modeling and similar assessments, the total amount of groundwater that can be withdrawn while still meeting the DFCs. The amount of production represented by the MAG should include all production, regardless of whether it is labeled as exempt or non-exempt.[125] With this understanding, a district should not issue permits for the full MAG but should reserve water for exempt well use.[126] In conclusion, it has been suggested that the statutory language in Chapter. 36 of the TWC, both in the definitions of 36.001(25) and in 36.1132, should be clarified to include all groundwater withdrawals including those that cannot be limited by permits (exempt) and those that can (non-exempt),[127] and the "managed" term in MAG should be changed to "modeled."

Areas without Groundwater Conservation Districts[128]

Lastly, areas without GCDs do not have a vote on the DFCs for their aquifers. Although groundwater is not regulated in these areas, the MAG values will be used by the RWPGs and, therefore, could affect the use of groundwater as a water management strategy. The TWDB has encouraged districts to reach out to areas without districts and also encouraged interested parties to get involved in the joint planning process in various presentations across the state.

Other Groundwater Management Issues

Although the committee hearing on April 15, 2010 was primarily centered around the DFCs process and its role in groundwater management, a few other issues were presented in relation to groundwater ownership, local versus state control, brackish groundwater, and long term permitting. These issues are discussed below in a very condensed format. It was not the intent of this committee to fully elaborate on these issues at this time, rather the issues and proceeding discussion are intended to bring to the surface other topics from the hearing about groundwater management in general.

Groundwater Ownership

Groundwater ownership in Texas has been and continues to be a highly debated topic. One perspective on groundwater ownership treats water beneath a landowner's surface in the same vein as a mineral right. Multiple court cases, beginning with the *East* case in 1904, have held that groundwater is part of the landowner's surface estate. So, like any other substance of the surface estate such as limestone, sand, and gravel, the landowner owns the water in their soil. Further, like limestone, sand, and gravel, the landowner has a vested right to "mine or quarry" the substances of the surface estate under reasonable regulation. Proponents of this theory believe that any rules adopted regarding the permitting of groundwater wells and the withdrawal of groundwater should recognize this vested property right and that a clarification from the legislature or Texas Supreme Court to this end would advance the fair and equitable regulation of groundwater. [129]

In response to the vested rights movement, other stakeholders question: if the legislature were to declare groundwater a vested property right, how this would play out in permitting by GCDs? They believe that if GCDs could never say no to a permit, districts would have no ability to preserve the groundwater of the state. Additionally, this could result in historical users (i.e. cities, industry, irrigators) being required to reduce their usage to make room for any and all new applicants. Further, a statewide correlative rights approach could be problematic because it could result in as low at 3.5 inches per acre-foot when it takes 36 inches to raise an irrigated crop.[130] Therefore, critics of a vested rights movement surmise that the regulatory approach to groundwater management should remain at the discretion of the local GCDs, in conjunction with regional and state water planning.

Local Control Versus Statewide Control

Another issue closely related to the groundwater ownership remains whether control of groundwater management should stay at the local level or shift to a statewide regime. Supporters of groundwater management through local control believe that regulation by GCDs is better and more effective for private landowners so they can work with their neighbors, rather than a state agency.[131] These stakeholders believe in reasonable regulation of groundwater so private landowners are treated fairly and afforded due process, so property rights are respected, and so all private landowners maintain the ability to use groundwater for any beneficial use. Locally elected or appointed officials are capable of setting groundwater management goals, and furthermore, the board or staff of a state agency is better qualified to make these decisions.[132]

In contrast, advocates of statewide control suggest that local control has embedded in it "local politics" and/or "local fears and prejudices," which can effectively stymie efforts to accomplish either the protection of private property rights or the greater good envisioned by the State Water Plan. One solution is to establish a central agency with statewide jurisdiction over groundwater regulation. The powers of such an agency could include the development of adequate science to provide a foundation for development of rules and practices for the management and regulation of groundwater. The new agency could also be responsible for permitting and enforcement of permit conditions. Additionally, statewide rules could be promulgated authorizing permitting by rule and similar processes designed to streamline the process and free up full-time staff to conduct and/or oversee the development of aquifer science and the promulgation of aquifer specific rules. In conclusion, proponents of statewide control believe that the state should have a means to regulate groundwater that will facilitate regulation in a manner that maintains its sustainability and maximizes its beneficial use while also honoring the property rights of those who own that groundwater.[133]

Brackish and Fresh Groundwater Delineation[134]

Another idea that could be explored by the legislature is the possibility of distinguishing brackish groundwater from fresh groundwater. As the rush to shallow freshwater supplies continues, the Governor, the legislature, the TWDB and many other political leaders across the state have recognized the potential benefits of using saline brackish groundwater to remove

some pressure from freshwater. This is water that very few entities can take advantage of because of the cost, energy needed, and access to the resources. In TWDB's brackish groundwater manual, Region L is considered one of the best sources for brackish groundwater in the state with an estimated supply of 300 million acre-feet. Currently, the state does not distinguish between brackish water and freshwater supplies in its management of groundwater. Since brackish groundwater is a commodity that must be further refined once it is pumped from the ground, some suggest delineating it away from the control of groundwater districts.

Long Term Permitting

The next issue in groundwater management centers around the development of long term permits for the production of groundwater. After the submission of the DFCs and the development of the MAG, the next step is the permitting process. Currently, production permits are issued in short terms of three to five years, even in the face of projects that cost ratepayers hundreds of millions of dollars. Projects of this financial scope require the issuance of bonds, which are more expensive if the certainty of the permit is limited. Currently, even Edwards Aquifer permits are permanent, as are most surface water permits, with some limitations created to manage through times of drought. Although the Edwards Aquifer is not the same as the Ogallala Aquifer, the point is that the focus should remain on the water resource rather than on the permits. Some purport permits should be longer in term, with safeguards to ensure that the actual use of the aquifer is sustainable while at the same time giving planning groups and public utilities the confidence needed as they plan for future water resources. [135]

Conversely, long term permits granted to new water users might adversely impact historical water users in the district. In addition, there exists a lot of uncertainties in regards to the management of an aquifer. If a GCD could not change the permitted amount over the life of the permit to react to droughts, falling water levels, and subsidence, then how would a GCD ensure the preservation of groundwater.[136]

RECOMMENDATIONS

Desired Future Conditions Planning Process

Provide better guidance/ framework to GCDs and GMAs for the determination/ development of DFCs. Consider the ramifications of altering "geographic area" language in the definition of DFCs.

Encourage further regional stakeholder participation in the DFCs process at the GMA level, possibly considering the addition of non-voting, ex-officio RWPG members to the respective GMAs.

Adjust the timing of the DFCs submissions in accordance with the overall State Water Planning timeline so that the most current DFCs may be incorporated into the regional and statewide planning processes.

Consider the incorporation of more formal proceedings for the DFCs petitioning process such as conducting a contested case hearing through the State Office of Administrative Hearings and evaluate the court's ability to award legal fees.

Clarify the statutory language related to "permitting up to the MAG" and the inclusion/ exclusion of exempt use in the MAG.

Other Groundwater Management Issues

Continue to monitor and evaluate the various ongoing groundwater management issues related to groundwater ownership, regulations, and permitting processes throughout the state, including the role of state agencies, regional planning groups, and local districts.

FEDERAL INITIATIVES

PUBLIC HEARING

The House Committee on Natural Resources held a public hearing on its Interim Charge #2 related to federal initiatives on February 3, 2010 at 9:00 a.m. in Austin, Texas in the Capitol Extension, Room E2.010. The following individuals testified on the charge:

Fred Caver, Self
Linda Christie, Tarrant Regional Water District
Miguel Flores, United States Environmental Protection Agency, Region 6
Gary Gibbs, Association of Electric Companies of Texas
Wendy Gordon, Texas Parks and Wildlife Department
Rich Herweck, Texas Combined Heat & Power Initiative
Ross Melinchuk, Texas Parks and Wildlife Department
David Oliver, Allen Boone Humphries Robinson LLP
Tom Ray, Texas Water Conservation Association
David P. Smith, Barrett & Smith, PLLC
L'Oreal Stepney, Texas Commission on Environmental Quality
Mark Vickery, Texas Commission on Environmental Quality
Kevin J. Ward, Texas Water Development Board
William West, Guadalupe-Blanco River Authority
Kathleen White, Texas Public Policy Foundation
Gary Zimmerer, Federal Emergency Management Agency, Region 6

The following section of this report related to federal initiatives is produced in large part from the oral and written testimony of the individuals listed above.

INTRODUCTION

There are several ongoing efforts at the federal level that could adversely affect or even derail our efforts at the state water planning level. Since 1961, Texas has adopted eight comprehensive State Water Plans, and we have set in motion a process to address State Water Planning every five years going forward. Since 1997, Texas has followed a process that incorporates regional planning, and in 2005 Texas further adopted measures to include local planning. In keeping with the overall goal of Texas State Water Planning process, the first Desired Future Conditions ("DFCs") are due on or before September of this year. In addition, Regional Plans will be adopted in 2011 and a new State Water Plan will be adopted in 2012. This process, and the members of the legislature molding it, set an impressive national example of how state, regional, and local planning can provide an excellent road map to water planning. Naturally, there is concern when efforts at the federal level start to over reach our state's natural resources.

The following pieces of proposed legislation and initiatives could impact Texas and State Water Planning:

- The Sustainable Watershed Planning Act which proposes to establish a federal "Office of Water;"
- The Clean Water Restoration Act which seeks to expand the federal regulation over all waters of the United States;
- A number of Flood Plain Management strategies;
- The revision of the Principles and Guidelines formerly applicable to only the US Corp of Engineers but, as proposed, applicable to all water projects; and
- The Endangered Species Act.

BACKGROUND

Sustainable Watershed Planning Act

The Sustainable Watershed Planning Act (the "SWPA") has been drafted by the staff of the Transportation and Infrastructure Committee of the U.S. House of Representatives. This bill creates a White House water resources director and a new Federal Office of Sustainable Watershed Planning. The central goal of the bill is described as sustainable use of the nation's water resources through increased water efficiency, improved water quality and improved ecological health. Economic uses of water, such as water supply storage, flood control, navigation, irrigation, and hydropower are not specifically mentioned in the bill as considerations. The Director of the Office of Sustainable Watershed Planning would be required to develop, for the first time, a national water resources policy that is consistent with the goals of the Act.[137]

While other states may be interested in the SWPA because they are more dependent on federal projects that cross state lines, Texas has already invested $67 million in State Water Planning. Each State Water Plan, which occurs every five years, costs around $16 million for the regional water planning groups alone.[138]

Clean Water Act

The Clean Water Act (the "CWA") prohibits the discharge of pollutants into "navigable waters" without a permit and defines "navigable waters" as "the waters of the United States (the U.S."), including the territorial seas." Previously, this definition has been applied broadly to include non-navigable bodies of water.[139] The Clean Water Restoration Act (the "CWRA") is proposed under the premise of resolving confusion following several Supreme Court decisions that restricted federal wetlands regulation to waters having a significant navigation nexus. However, in proposing to resolve the jurisdictional confusion, the CWRA would, for the first time, impose federal regulation on all waters of the U.S., by removing the nexus to navigation and interstate commerce. If enacted, not only all water but also all land where rain falls would potentially be subject to federal regulation.[140]

The two most recent Supreme Court cases that have molded the definition for water of the U.S. are *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* ("*SWANCC*") and *Rapanos vs. U.S* ("*Rapanos*"). The *SWANCC* decision excluded isolated, non-navigable, intrastate waters as waters of the U.S. As a result, isolated wetlands under Section 404 of the CWA are no longer covered by the federal government through the U.S. Army Corps of Engineers (the "Corps") and Environmental Protection Agency (the "EPA") regulations. This case was focused on a hydrologically isolated, and abandoned quarry which resulted in a considerable amount of additional legal testing of the extent of the CWA's jurisdiction.[141]

The *Rapanos* case attempted to clarify the extent of the CWA's jurisdiction. However, the nine justices issued five separate opinions in *Rapanos*, with no single opinion commanding a majority of the Court. The 4-4-1 ruling reached in the *Rapanos* decision created controversy over whether a clear statement exists regarding how far the federal government's jurisdiction reaches regarding activities that may have water quality impacts in various bodies of water. In December 2009, the Corps of Engineers and Environmental Protection Agency ("EPA") finalized guidance on implementing the *Rapanos* decision. The guidance identifies the waters the agencies will or will not assert jurisdiction over and how the agencies will use hydrologic and ecological data to make case-by-case determinations whether there is a significant nexus with a navigable waters and adjacent wetlands. Implementation of guidance takes time and documentation for each water body.[142]

When Representative Oberstar introduced the 2007 CWRA with the stated intent of returning jurisdiction to the coverage prior to the *SWANCC* decision, a companion bill was introduced in the U.S. Senate by Senator Feingold. Neither bill passed through committee. On April 2, 2009 Senator Feingold and co-sponsors reintroduced the 2009 CWRA (S. 787). According to Senator Feingold's press release, the bill aimed to restore the protections to

isolated wetlands and headwater streams that have been reduced as a result of *SWANCC* and *Rapanos*. It passed the Senate Environment and Public Works Committee in June of 2009 but, as of the date of this report, has not been scheduled for a floor vote.[143] After this committee's hearing in February 2010, Representative Oberstar reintroduced the bill as "America's Commitment to Clean Water," H.R. 5088. No hearing at the federal level was held on this bill and it has not been set for a floor vote.

Flood Plain Management[144]

A proposed revision to Presidential Executive Order ("EO")11988 on Flood Plain Management, first issued by President Carter in the 1970's, is being developed by the White House Council on Environmental Quality (the "CEQ"). The new EO would expand federal regulation of the nation's floodplains to stringently limit state and local land use choices and restrict economic uses of the flood plain. The EO would direct federal agencies, in carrying out their responsibilities, to not pursue or permit traditional structural projects. Instead, they would favor non-structural measures, like permanent evacuation of the flood plain wherever practicable. Ecological goals would be given priority. Water supply, navigation, hydropower and structural flood control projects, along with certain agricultural practices and communities located in floodplains, would be disadvantaged. This EO is particularly significant when you consider that it would work in concert with the CWA to direct the Corps and the EPA, when considering action on a CWA permit request, to determine if there is any other practicable alternative before granting the permit. Work on the EO revision was delayed pending advancement of the Principals and Guidelines ("P&Gs") draft due to the significant concerns expressed by a variety of interests in late 2009.

Texas Commission on Environmental Quality's Role in Floodplain Management[145]

The Texas Commission on Environmental Quality (the 'TCEQ") is responsible for conducting Section 401 certification reviews of the Corps' Section 404 permit applications for the discharge of dredged or fill material into waters of the U.S. including wetlands. The purpose of these certification reviews is to determine whether a proposed discharge will comply with state water quality standards. Some of the typical projects reviewed include:

- Canal/House Subdivisions
- Road Projects
- Commercial Industrial Centers
- Ship Channel dredging
- Stream Channelization/Flood Plain Projects

These activities may also occur within a floodplain which requires a Corps permit and a 401 certification from the TCEQ.

In general, the draft EO's purpose is to strengthen the federal government's commitment to reducing the loss of life and property caused by floods and to protecting and restoring the natural resources and functions of floodplains. The EO would apply when federal agencies:

- Acquire an interest in, manage, or dispose of lands, structures, and facilities;
- Construct or substantially improve federal facilities;
- Finance or otherwise assist in the construction or improvement of facilities;
- Develop or evaluate water resource and land use plans; and
- Regulate, permit, or license water resource and land use activities.

Further, the decision making process for covered actions of the draft EO has the following requirements for the Corps to consider:

- Identify floodplains – use Federal Emergency Management Agency ("FEMA") maps to determine if activity occurs in or adversely affect a flood plain;
- Identify and evaluate practicable alternatives;
- Identify and mitigate effects;
- Process requirements for disposing of federal property;
- Process requirements for federal financial involvement; and
- Process requirements for planning and issuance of federal licenses, permits loans, and grants.

Therefore, the TCEQ must further consider floodplain management when developing or evaluating water or land use plans in order to ensure that the use of land and water resources is appropriate to the degree of hazard involved, as well as when providing guidance to applicants in order to help them evaluate the adverse effects of their proposed actions before they apply for federal licenses, permits, loans, or grants.

The Corps currently requires its applicants to have some form of written approval from FEMA for permitted activities that occur in floodplains. This would likely remain the requirement if the EO becomes final. The second part of the decision making requirement above is simply a pre-application educational service to their applicants. The TCEQ would continue conducting the 401 certifications on projects permitted by the Corp.

Principles and Guidelines

Revised Principles and Guidelines ("P&Gs") for water resources planning have been produced by the CEQ. By way of background, Congress originally gave this task to the Secretary of the Army (the "Secretary") and the Corps in the Water Resources Development Act

(the "WRDA") of 2007. As now drafted, the new P&Gs document proposes a change from the present standard of assessing potential projects based on economic benefits to one creating a specific preference for ecosystem restoration outputs. A draft of the new P&Gs document was issued in December 2009 for public review and comments were due March 5, 2010.[146]

Endangered Species Act[147]

The goal of the Endangered Species Act (the "ESA") is to conserve, recover, and protect threatened/ endangered plants and animals and the habitats in which they are found. In addition, Section 9 of the ESA prohibits the "take" of listed endangered species. A "take" is defined as "harass, harm, pursue, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Once a species is listed, Section 9 of the ESA applies and "take" of that species is prohibited. A "take" of a listed species is only allowed if it is incidental to an otherwise legal activity and is covered by either a Biological Opinion with an Incidental Take Statement resulting from consultation under Section 7 of the ESA or a section 10(a) incidental take permit resulting from preparation and approval of a Habitat Conservation Plan (HCP).

There are currently 1,317 species listed in the U.S. Texas currently has 94 listed species, which ranks as fifth most among the states. Since the passage of the ESA, only 31 species have been delisted. Nine (less than one percent) have been delisted due to extinction, only 22 (around one percent) have been delisted because they were recovered. In addition to "listed" species under the ESA, the United States Fish and Wildlife Service (the "FWS") has created a Candidate Species List. This list is comprised of all species determined to be "warranted" for listing but precluded by higher listing priorities. Currently, there are 249 species in the U.S. and its territories on the Candidate Species List. Twenty-one of these species are in Texas (18 animals and three plants). Texas ranks third among the states in the number of Candidate Species.

In 2007 and 2008, a series of petitions was filed by WildEarth Guardians, an environmental group headquartered in Santa Fe, New Mexico, with the FWS requesting that almost 500 species be listed in the southwestern U.S. as endangered or threatened under the ESA and to designate critical habitat for each species listed. A lawsuit was subsequently filed by WildEarth Guardians in order to force the FWS to process determinations on these 500 petitioned species. This lawsuit was settled by the FWS, requiring the FWS to move forward in determining whether any or all of these petitioned species should be listed through Section 4 of the ESA process as threatened or endangered.

On December 15, 2009, the FWS published a notice in the Federal Register announcing that it had made a positive "substantial 90-day finding" on nine freshwater mussel species in Texas, indicating that the FWS had received a petition which, in its judgment, contained "substantial information indicating that listing [these nine species] may be warranted." Subsequently, on December 16, 2009, the FWS published a notice in the Federal Register announcing that it had made a positive "substantial 90-day finding" on 30 additional Texas species (five amphibians, eight fish, two clams, one snail, four insects, one crustacean, eight flowering plants, and one fern ally), indicating that the FWS had received a petition which, in

its judgment, contained "substantial information indicating that listing [these additional 30 species] may be warranted."

Accordingly, the FWS announced that it would be conducting a status review, a 12-month review, in accordance with the ESA in order to determine whether or not these species are warranted for listing under the ESA. The FWS has formally requested information from "governmental agencies, Native American Tribes, the scientific community, industry, and any other interested parties" concerning the status of these 39 species. The information received by the FWS during this status review will be the basis for determining whether or not these 39 Texas species will be proposed for listing under the ESA.

DISCUSSION AND CHALLENGES

Sustainable Watershed Planning Act

This bill would establish a White House Office of Sustainable Watershed Management, with broad control over all federal water resources programs, including new project proposals, the regulatory programs of the Army Corps of Engineers, and the operations of existing federal projects.

Federally administered regional watershed planning boards also would be created. These boards would be charged with establishing watershed plans that seek to "increase water efficiency, improve water quality and improve ecological resiliency," with no recognition of economic well-being as a co-equal objective. If this legislation is enacted, all local water projects likely would have to pass through the new White House Office of Sustainable Watershed Management and a regional watershed board.[148]

Clean Water Act

The CWRA seeks to clarify the federal jurisdiction of the CWA by expanding the existing definition to all "Waters of the United States". This change would extend federal jurisdiction over Texas waters not currently regulated and could call for new state compliance with broader regulation.[149]

The TCEQ currently complies with the CWA by protecting water quality and supply through several regulatory programs including the Texas Pollutant Discharge Elimination System wastewater discharge permits, water quality standards, 303(d) list for impaired waters, total maximum daily load, non-point source programs, and 401 state certification of 404 dredge and fill permits issued by the Corps. Under the new definition, it could be argued that all small bodies of water and intermittent streams would fall under CWA purview, likely increasing the number of Section 404 Dredge and Fill permits required for projects involving water bodies that would have otherwise not fallen under state or federal purview. The TCEQ would also likely have a significant increase in the volume of applications for 401 Water Quality Certifications.[150]

Some states have questioned the constitutionality of such a change to the CWA, increasing the likelihood of legal challenges to implementation of such a law. [151]

Flood Plain Management

Federal control over water resources and floodplain management could be expanded through the proposed EO. These changes could create policy directives that would greatly complicate and lengthen the process of securing federal permits for virtually every type of water-related project sought by local government and business interests and could render some vital projects unviable altogether.[152] Such a proposal has been seen by some as an attempt, by the Executive Branch of federal government and in Congress, to institute top-down control of water resources and to shift critical decision making from the local to the federal level.[153]

If implemented, the requirements in the draft EO could have a dramatic impact on federal agencies or others receiving federal support or requiring a federal permit for a project located in or affecting a floodplain.[154] This could be used effectively to stop or significantly slow down certain new projects, such as land acquisition for and the construction of reservoirs.[155]

Principles and Guidelines[156]

As currently drafted, the P&Gs encompass all federal agencies with jurisdiction over water resources issues. This would mean no local government or business will be able to secure a permit for virtually any type of project in the floodplain unless all agencies with jurisdiction agree that a project is in compliance.

The P&Gs draft currently states that only projects and actions that provide a net benefit would be recommended for construction. And, for the first time, such evaluations would be required to give full and equal consideration to non-structural solutions. This could impact a wide spectrum of local government and private business developments. A final draft for revised P&Gs was released December 4, 2009, and has been sent to the National Academy of Sciences for a one-year period of review, after which final P&Gs will be issued. A 90-day public comment period is underway; however, some concerned parties fear that CEQ will have the President first sign the revised EO on Floodplain Management and then force the new P&Gs to comply with the Order's emphasis on ecological goals at the expense of socio-economic factors.

Endangered Species Act[157]

A large number of the 39 species currently under review by the USFWS have been identified as species for which the asserted threats are related to water quality and water quantity. In the case of water and water planning efforts, the potential listing of these species would fundamentally change the way water planning, water projects, and land use decisions are made within each basin.

If a water-dependent listed species occurs in a particular river basin in the state, any public or private action occurring in that basin would be potentially subjected to federal regulation, oversight and approval. For example, any and all dams, exiting reservoirs, new reservoirs, hydroelectric projects, irrigation, water rights, wastewater discharges, agricultural uses, development, or other land use would potentially be subject to Federal oversight and approval by USFWS. In addition, due to the citizen suit provision of the ESA, any project or activity in any river basin where listed species might be found would be subject to lawsuits from any individual or environmental group located anywhere in the United States. These individuals and groups would have legal standing in Federal Court to object to the way any state agency, river authority, business, landowner, or family farmer conducts an otherwise legal activity, based purely on the allegation that a particular activity causes harm to or harasses listed species.

If some of these 39 species under review are listed, water planning efforts in Texas could begin to mirror the planning that occurs in many western states, where decisions regarding allocation of existing water rights, operation of existing dams and hydroelectric projects, operation of irrigation projects, and other activities involving water quantity and quality are subjected to Federal oversight and review, and are vulnerable to citizen lawsuits.

Other Federal Initiatives[158]

In addition, there are a number of other initiatives with a potential direct impact on water resources and the state and local regulatory authority thereof, including:

- H.R. 2454, the American Clean Energy and Security Act of 2009
- The "National Policy for the Oceans, Our Coasts, And the Great Lakes"
- The Omnibus Public Land Management Act of 2009 (PL 111-11, 123 Stat. 991)
- Levee inspection protocols, certifications and FEMA map modernization

If enacted, these initiatives would fundamentally change the federal oversight of the nation's water resources.

RECOMMENDATIONS

Continue to monitor and evaluate the effects of current and proposed federal initiatives that could impact the implementation of the State Water Plan.

DROUGHT AND CONSERVATION

PUBLIC HEARING

The House Committee on Natural Resources held a public hearing on its Interim Charge #3 related to drought and conservation on March 9, 2010 at 2:00 p.m. in the San Antonio City Council Chambers. The following individuals testified on the charge:

Darrel Andrews, Tarrant Regional Water District
Ed Archuleta, El Paso Water Utilities
Carole Baker, Alliance for Water Efficiency
John Brocksch, Aquifer Group, LLC
Jun Chang, Public Works and Engineering Dept City of Houston
Steve Clouse, San Antonio Water System
Karen Guz, San Antonio Water System
Faris Hodge Jr, Self
Ken Kramer, Lone Star Chapter, Sierra Club
Robert Mace, Texas Water Development Board
Jody Puckett, City of Dallas Water Utilities
Robert R. Puente, San Antonio Water System
Mike Rickman, North Texas Municipal Water District
Carlos Rubinstein, Texas Commission on Environmental Quality
Susan Spegar, Edwards Aquifer Protection Program
L'Oreal Stepney, Texas Commission on Environmental Quality Office of Water
Alia Vinson, Allen Boone Humphries Robinson LLP
CE Williams, Water Conservation Advisory Council

The following section of this report related to drought and conservation is produced in large part from the oral and written testimony of the individuals listed above.

INTRODUCTION

In 2008 and 2009 Texas experienced the worst drought it has seen since the 1950's.[159] San Antonio for example, went through the driest 23-month period on record since 1885.[160] For much of the Hill Country, this was the most severe drought since the drought of record in the 1950's.[161] At the peak of the drought, 85 percent of the state was under drought conditions. In addition to the elements of drought, Texas is faced with a population that will double and a demand for water that will increase by 27 percent, both in the next 50 years.[162] In order to match the state's supply and demand, it will become crucial to utilize tools such as water conservation plans and drought contingency plans more efficiently, further pursue new technologies, and develop better conservation methods.

Currently, state agencies provide the state and legislature with information on drought, water conservation plans, and drought contingency plans. With the agencies' involvement, the legislature has a comprehensive look at the process of water conservation plans and insight on the triggers for the drought contingency plans. Additionally, the state has created a council which supplies information to the agencies and legislature on how to best maximize our state's water conservation practices.[163] Overall, Texas is making significant progress in water conservation by encouraging the use of recycled water, desalination, and other water saving initiates. Keep in mind Texas' vastly diverse landscape, the legislature is presented with exciting opportunities to excel in this field.

BACKGROUND

Drought, the continued use of water, and population growth will become more of a threat to our water supply as we move into the future. As Texans struggle to find a balance among water supply and demand, the goals indentified in water conservation plans and the use restrictions in drought contingency plans will take on a much greater importance in terms of conserving water.

Drought Conditions: 2008-2009 Drought

In 2007, La Niña weather patterns brought in the beginning of one of Texas' worst droughts.[164] According to data provided by the Lower Colorado River Authority, it was indeed the worst drought recorded for parts of central and south Texas, including Austin and San Antonio.[165] Both surface and groundwater supplies were impacted; reservoir and aquifer levels approached record lows. For example, Austin's water supply in Lake Travis and Lake Buchannan were down to 37 percent and 42 percent capacity, respectively, and 230 public water systems declared mandatory water restrictions.[166] Almost half of the state (45 percent) was in a "severe" to "exceptional" drought, and 100 percent of Texas experienced some level of drought.[167] For two years, drier weather patterns in combination with high temperatures above 100 degrees, little rain, and intense sun led to some of the worst summer weather. July 2009 was not only the hottest July in Texas history but also the hottest month on record for San Antonio, Austin, Houston, Corpus Christie and McAllen. Additionally, the hot and sunny

conditions led to further evaporation of an already strained water supply, especially with surface water. Though the 1950's drought of record lasted longer, the 2008-2009 drought was worse in intensity.[168] Relief finally came in the form of an El Nino climate pattern which typically brings in wet weather and by 2009, 50 percent of drought conditions had lessened across the state.[169]

An assessment of losses resulting from the 2008-2009 drought is estimated to be around $3.6 billion, in addition to incalculable impacts on the environment. As of February 2010, 90 of the state's 4,711 water supply systems were still under mandatory restrictions; most of those were located in central Texas.[170] Since 2010, drought conditions have significantly improved. By February 2010, there were few areas affected by exceptional, extreme, or severe drought, and the normally drier areas were in moderate conditions. Additionally, reservoir storage was back up to 83 percent of total statewide storage capacity by January 2010. For example, the Edwards Aquifer, which is located in one of the driest areas, had experienced significant decline in water levels during the 2008-2009 drought, falling as low as 640 feet above mean sea level ("msl"). This led to the enactment of a "Stage One" drought restriction and almost made it to a "Stage Three" drought restriction. There since has been a rise in levels to 675 feet above msl in Jan 2010.

Agency Oversight / Statutory Regulation of Water Conservation Plans and Drought Contingency Plans

Both the Texas Water Development Board (the "TWDB") and the Texas Commission on Environmental Quality (the "TCEQ") play a large role in state wide conservation. State requirements ask water rights holders and retail public water suppliers to turn in Water Conservation Plans ("WCPs") and Drought Contingency Plans ("DCPs") to the TWDB and the TCEQ, respectively . In 1997 Senate Bill 1 required water rights applicants to include WCPs and introduced DCPs, formerly called Emergency Demand Management Plans. Other relevant legislation includes House Bill 4 in 2007 that requires annual reporting and Senate Bill 3 in 2007 that furthered these goals by requiring WCPs to be submitted to the TWDB and enforcing submission requirements through the TCEQ.[171]

Water Conservation Plans

WCPs and annual reports are required by the Texas Water Code and agency rules. WCPs are required of all retail public utilities that provide potable water service to 3,300 or more connections and all that receive financial assistance from the TWDB. They are to be submitted to the TWDB and the TCEQ every five years. These plans consist of a "strategy or strategies for reducing the volume of water withdrawn from a water supply source for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water."[172]

All water rights applicants are required to submit plans accompanied by an implementation report and to update them every five years with five and ten year conservation goals. In total, 703 entities are required to submit their plans to the TWDB.[173] The role of the TWDB is to provide technical assistance in the development of the WCPs, as well as guidance

through suggested criteria for gallons per capita per day ("GPCD"), amount of water saved, awareness programs, and rate structure. In addition, the TWDB uses WCPs when making recommendations for the funding of certain improvements that will conserve water. In order to receive funding through the TWDB, water rights holders must turn in a WCP with a loan application. Loan applications submitted without a WCP are set aside until the WCP is provided. Currently, most of the entities required to turn in WCPs have submitted materials, and others are working with the TWDB to address missing elements.[174]

Annual Reporting

Each entity that submits a WCP is also required to submit an annual report to the Executive Administrator of the TWDB. The report details progress each entity is making on implementing their WCP and whether the entity had to initiate their DCP in the past year. Additionally, the annual report includes information on the following: education and information programs; retrofit and plumbing rebate; rate structure; meters; water loss audits; conservation programs; and water reuse development. It also indicates whether DPCs were implemented by the entity.[175] The first round of reports was due May 1, 2010. According to the TWDB, at the date of this report, approximately 90 to 95 percent of reports due in 2010 have been received. This number is approximately 60 to 65 percent of all required WCPs because many submissions are not due until 2011.

Drought Contingency Plans and Triggers

All retail public water suppliers, municipal water rights applicants, water systems with 3,300 or more connections and wholesalers in Texas are required to have a DCP submitted to the TCEQ. A DPC is a "strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies." The individual water supplier determines the triggers for voluntary and mandatory water use restrictions, which can be adjusted as often as needed each year depending on supply and demand conditions.[176] The TCEQ's primary role is to collect plans; accordingly, it does not have many enforcement options. The TCEQ has the ability to require submission of plans and may hold back a permit where a plan is not submitted. It is up to the water suppliers, however, to ultimately implement the plan. [177]

A DCP includes criteria for initiation and termination of drought stage responses. Stages of drought are determined by triggering criteria. The person or entity monitoring the water supply and/or demand can conclude that conditions "warrant initiation or termination of each stage of the DCP, that is, when the specified triggers are reached."[178] Triggers for drought response stages can be one or a combination of stream or river flow volume, static water level, well capacity, water demand, reservoir levels, amount of water supply storage, or time of the year. Drought response stages, although the number and type can vary for different suppliers, can range from mild or moderate to severe or critical; the worst response stage being water allocation. Each retail water supplier does not have and is not required to have the same triggers or stages because suppliers have variables such as water sources (surface or groundwater), geographies, and populations. Therefore, triggers for "Stage One" might be met for one supplier but not by its neighbor.[179]

Once triggers have been met and stages of drought response have been activated, restrictions can also vary. "Stage One" starts with voluntary restrictions, mostly in the form of watering and irrigation schedules. As the stages progress, customers can be required to limit or stop washing vehicles, refilling pools/ponds, and landscaping golf courses, all depending on the drought's severity. The driest condition, or "Stage Six", consists of water allocation where residential customers are rationed gallons per month depending on the size of households. Commercial and industrial customers are rationed and given surcharges. These restrictions are enforced and punishable by fines and/or termination of service.[180]

Water Conservation Advisory Council[181]

The Water Conservation Advisory Council (the WCAC") is also a great resource to the state. The WCAC was formed with the passage of Senate Bill 3 and House Bill 4 in 2007. "The WCAC was created to provide the Governor, Lieutenant Governor, Speaker of the House of Representatives, Legislature, Texas Water Development Board, Texas Commission on Environmental Quality, political subdivisions, and the public with the resource of a select council with expertise in water conservation. No later than December 1st of each even-numbered year, the WCAC is to submit to the Governor, Lieutenant Governor, and Speaker of the House of Representatives a report on progress made in water conservation in this state."[182] The next report is due to the 82nd Legislature in December 2010. The report will cover these seven charges from its enabling legislation:

1. Monitor trends in water conservation implementation; In the December 2010 report the WCAC will review data provided by TWDB and TCEQ on water conservation plans and annual reports required from approximately 700 entities;
2. Monitor new technologies for possible inclusion by the TWDB as Best Management Practices Guide developed by the Water Conservation Implementation Task Force; the WCAC is contacting interested parties for suggestions on revisions for new Best Management Practices and is working very closely with the national group, Alliance for Water Efficiency;
3. Monitor the effectiveness of the statewide water conservation public awareness program and associated local involvement in implementation of the program; Report will contain information on TWDB's *Water IQ* program. However, this was not funded last session;
4. Develop and implement a state water management resource library; the WCAC is currently using savetexawater.org as one reference source. The WCAC is coordinating with the Alliance to utilize their existing national reference library as the primary reference source;
5. Develop and implement a public recognition program for water conservation; the WCAC will participate on TCEQ's Blue ribbon Panel for Excellence Awards-Water Conservation Awards;
6. Monitor the implementation of water conservation strategies by water users included in regional plans; the WCAC work group along with TWDB staff will

interview several regional Water Planning Group Chairs about water conservation progress in their respective regions; and

7. Monitor target and goal guidelines for water conservation to be considered by the TWDB and TCEQ; the WCAC has had extensive discussion and study, several example voluntary studies under way.

The WCAC's conservation work will become increasing important to the State of Texas as it faces population growth and swelling water demands. Regional Water Plans are relying heavily on water conservation to meet future water needs and conservation is still the most cost effective alternate to meet those needs; therefore, special consideration should be given in how to best implement water conservation practices.

Desalination, Recycled Water Resources, and Aquifer Storage and Recovery

Desalination

Desalination, the process of removing salt from water, has been used all over the world. Some cities in Texas have been moving forward with developments to make this technology viable in the state. In 2007, the 80th Texas Legislature was successful in passing two important pieces of legislation that assisted in the development of desalination projects. House Bill 2618 provided Texas municipalities with the ability to utilize design-build procurement procedures for water supply projects. Design-build procurement has the potential to reduce construction time and cost for major projects conducted in the State. In addition, House Bill 2654 provided for a general permit for Class I injection wells that would be utilized to dispose concentrate from a municipal desalination plant.[183]

In San Antonio, brackish groundwater could provide San Antonio Water System ("SAWS") with a potential new source of water that can be developed close to home. Up to 22,000 acre-feet annually could be made available to our water supply to help offset future water demand. Feasibility work has been completed on a brackish groundwater desalination project located in southern Bexar County. Conceptually, desalination facilities as small as 1 million gallons per day ("mgd") and plants larger than 100 mgd have been reviewed. The South Central Regional Planning Group, or Region L, has included brackish groundwater as a water management strategy to meet future water needs.[184] For a long term project, results show that a sufficient quantity and quality of groundwater resources are available. The project is more fully described in SAWS 2009 Water Management Plan Update. The state has already contributed 35 million dollars towards this project.[185]

In west Texas, El Paso is the site of the world's largest inland desalination plant. A joint project of El Paso Water Utilities ("EPWU") and Ft. Bliss, El Paso's desalination facilities produce 27.5 mgd of freshwater making it a critical component of the region's water portfolio. Employing a previously unusable brackish groundwater supply, the Kay Bailey Hutchison Desalination Plant is creating a new supply of water which increases EPWU's freshwater production by approximately 25 percent.[186]

The availability and demand of freshwater is a serious challenge facing not just the desert southwest but the world. A reliable and secure supply of water for a growing region must be met by the carefully selected and economically efficient development of new water. The Kay Bailey Hutchison Desalination Plant strives to accomplish this.[187]

Recycled Water Resources

Reused or recycled water is collected, cleaned, and used for non-drinking purposes such as watering landscape, cooling electricity plants, or recharging aquifers. There are some Texas cities with impressive reuse systems that are helping to supplement their water supply.

For instance, San Antonio has the nation's largest recycled water system. "There are more than 100 miles of pipe that can deliver 1 billion gallons of recycled water to commercial and industrial customers each year for non-potable uses." The recipients include factories, golf courses, athletic complexes, and cooling towers. This use of recycled water saves freshwater for drinking and home use. Twenty percent of the water that SAWS uses is recycled water coming from energy power plants and other customers.[188]

Likewise, EPWU has been delivering reclaimed water to the community since 1963. El Paso now operates one of the most extensive and advanced reclaimed water systems in Texas for industrial use and landscape irrigation. The EPWU supplies golf courses, city parks, school grounds, apartment landscapes, construction, and industrial sites with over 5.25 mgd of reclaimed water. Wastewater within the EPWU service area is collected and treated at one of four wastewater reclamation plants using advanced secondary or third level treatment. The result is high water quality that earned the utility the reputation of operating the first wastewater treatment plant in the world to meet drinking water standards for its reclaimed water.[189]

The EPWU operates several wastewater treatment facilities in the area. One project currently under construction, the Northwest Reclaimed Water Project, provides over 450 million gallons of reclaimed water through 25 miles of pipeline to various locations in northwest El Paso. "A fully automated dispensing station operates continuously to provide uninterrupted service to contractors and others for construction, street sweeping, etc. The project value is $23 million paid for by grants from the U.S. Bureau of Reclamation, the TWDB, and through City of El Paso Water and Sewer revenue bonds from the EPWU. Reclaimed water from the Northeast Reclaimed Water Project is used to irrigate ball fields, playgrounds, and landscapes. Another project, The Fred Hervey Reclaimed Water Project, saves approximately 1,200 million gallons of potable water. In addition, almost 800 million gallons of reclaimed water is returned to the Hueco Bolson for aquifer recovery through injection wells and infiltration basins."[190]

Another water supplier excelling in reuse is Tarrant Regional Water District ("TRWD"). Their reuse project is the first to use their reused water as a water supply strategy.[191] TRWD's reuse project supplies raw water to more than 1.8 million people, a number that is expected to rise to 4.3 million by 2060. The system fees back water in to the Richland Chamber Reservoir through a series of sedimentation ponds and wetland cells that naturally treat water obtained from the Trinity River. Two hundred acres of additional wetland cells were added in 2008 to

the 2002 existing 250-acre field scale wetlands project. Eventually, TRWD's wetlands project will feature nearly 3,000 acres of high quality habitat that can be used as a living filter for additional water supplies and help the district meet those projected population demands, pushing back the need to construct additional water supply reservoirs."[192]

Aquifer Storage and Recovery

One of the more innovative methods being used to provide long term solutions for meeting the decreasing supply and growing demand for water is aquifer storage and recovery ("ASR") or "aquifer banking." This process entails using an empty or low aquifer to store excess water, which includes water from excess flood flows and recycled water. The water is then diverted to the aquifer, sometimes aided by brush clearing to improve flows, and then stored until needed, followed by little to no evaporation. In a feasibility study conducted by the TWDB, "the researchers found that ASR projects could be beneficially used to provide water in remote parts of service areas, to reduce pumping from the Edward Aquifer…, and to store surface water during periods of excess supply. They estimate that ASR could provide up to 28,000 acre-feet per year for SAWS and 9,000 acre-feet per year for BexarMet at a cost of $82–$398 per acre-foot."[193]

SAWS, one of the nation's largest water and sewer utilities, has had to think outside of traditional means to ensure the city has an adequate supply of water.[194] A large component of this supply will come from the Twin Oaks Aquifer Storage and Recovery Facility. SAWS opened the Twin Oaks ASR in 2004; it was the first major project funded by SAWS customers through the Water Supply Fee. Some of world's leading officials on ASR contributed to the project. A simple idea, water is taken from the Edwards Aquifer throughout the year, stored in the Carrizo Aquifer and recovered for use during dry, high demand times. When completed, Twin Oaks will be the second largest ASR facility in the nation, and the total cost for Phase I and Phase II will be $255 million.[195]

Further, "Aquifer Group is the first U.S. owned company with the capabilities to locate and restore lost aquifer recharge opportunities prolific enough to support large scale water development and investment."[196] This company believes that aquifer banking is especially imperative for Texas because climate change could mean wetter wets and dryer dries. The excess water from the wetter seasons can be stored for use during the dryer seasons. In light of Texas' history of droughts, another benefit of aquifer storage is protecting the supply we do have from evaporation from Texas's high heat and dry spells which can cause accelerated evaporation.

Statewide Conservation Programs

Conservation Education

Conservation education and other conservation tools are important measures for ameliorating growing water shortages. There is currently a state wide water conservation awareness program called *Water IQ: Know your water*. "Through Water IQ, the TWDB provides information on water-efficient practices, raises awareness about the importance of

water conservation, and helps Texans use less water." The website allows citizens to find out what conservation measures are happening in their area and other useful water saving information.[197] There are other conservation awareness programs in place including *Save Water* used in Dallas and TRWD. Both aim to educate customers on how much water they are using and simple ways to save water in daily life.

There has been much success in decreasing water usage by spreading conservation awareness among the public. After implementing *Save Water*, the city of Dallas reported a "significant drop in peak day demand" as did North Texas with the use of *Water IQ*.[198] In response to drought conditions and declining water supply, North Texas Municipal Water District ("NTMWD") launched the *Water IQ* campaign and implemented "Stage Three" of its DCP in June 2006 to reduce consumption during peak summer months. After, consumption levels continue to be lowered 200 mgd during peak summer months, or an annualized 12-15 percent (8.8 billion gallons/yr.). Since 2006, consumption has remained below the estimated water demand despite population growth.[199]

Conservation Initiatives

In addition to awareness programs, there are city wide initiatives replacing or repairing plumbing fixtures to maximize water savings. One successful initiative is to replace older toilets with low flow models. SAWS, for example, offers showerheads, aerators, and toilets at no cost to its customers in order to save water. This includes both residential and commercial users. "Highlights of these exchanges include:

- SAWS has replaced 230,000 toilets to date (2009);
- Saves 2,300,000,000 (enough to support more than 28k families of 4 in a yr);
- Cost to ratepayers for securing this "new" source of water averages $250 an acre-foot".[200]

Austin is another city that provides more efficient toilets with the *Free Toilet Program*. They now offer high-performance, high-efficiency toilets. These toilets with dual flush technology ensure great performance and reduce water consumption. A customer can apply to replace up to 3 toilets per home, if their existing toilets were installed before January 1, 1996.[201] Additionally, Dallas replaces older plumbing fixtures. The city has replaced more than 14,000 toilets through the *New Throne for Your Home* voucher program since 2007.[202]

During the 81st Legislature, House Bill 2667 was passed addressing statewide requirements for certain plumbing fixtures including toilets, urinals, and showerheads to meet new water conserving standards. This legislation required toilets for sale or use to be required to be 1.28 gallons, down from 1.7 gallons, beginning in 2010. This is projected to yield savings of 170,000 acre-feet of water annually.

Lastly, the Environmental Protection Agency promoted a nationwide conservation project referred to as *Fix a Leak Week*. "An American home can waste, on average, more than 10,000 gallons of water every year due to running toilets, dripping faucets, and other

household leaks. Nationwide, more than 1 trillion gallons of water leak from U.S. homes each year. That's why WaterSense promoted *Fix a Leak Week* from March 15 - 21, 2010, to remind Americans to check their plumbing fixtures and irrigation systems for leaks."[203] Many cities in Texas, including San Antonio, Austin, Laredo and Dallas participated in *Fix a Leak Week*. Dallas received national recognition for its success in the project.

DISCUSSION AND CHALLENGES

Enforcement of Water Conservation Plans and Development of Triggers for Drought Contingency Plans

While WCPs and DCPs are intended to promote accelerated conservation in times of higher drought, the way water suppliers use or don't use these plans can affect their results. Triggers associated with DCPs also present some concerns as there are multiple factors involved in setting them.

Currently, little exists to enforce the submission and follow up of WCPs and DCPs. If a water rights holder does not turn in a WCP, loan applications submitted without a WCP are set aside until the WCP is provided. Once a DPC is submitted, the TWDB can make recommendations for the funding of certain improvements that will conserve water but cannot require the entity to follow those measures. With a DCP, it is up to the water supplier to implement the plan, but the TCEQ does not have the ability to require the plans to be submitted. If a DCP is not turned in, the TCEQ could hold back its permit, but ultimately, their primary role is to collect the plans.[204]

There is also concern with the effectiveness of triggers selected by water suppliers. The individual water supplier determines the triggers for voluntary and mandatory water use restrictions, which can be adjusted as often as needed each year depending on supply and demand conditions. A problem can occur when drought conditions have worsened but a trigger has not yet been met and water use restrictions have not begun.[205] Increased strength in or mandatory compliance of WCPs and DCPs would help them better serve their purpose and yield higher conservation numbers.

Development of a Standard Gallons per Capita per Day Measure by the Water Conservation Advisory Council

The WCAC is working on a report due to the legislature December 1, 2010. This report will address a number of charges referred to earlier in this report; however, one challenge commonly cited is a standard measure for determining gallons per capita per day ("GPCD").

GPCD, refers to the amount of water used per person per day. As of now, this number includes municipal, manufacturing, electric, mining, livestock and irrigated agriculture water use.[206] There is no method for Texas cities to uniformly measure and evaluate their water use. Lack of a uniform measure makes it nearly impossible to fairly compare cities' water use to one

another. The new method will break down the cities' GPCD number into two categories: commercial and residential. This division will help to more accurately take into account inflated use numbers. For example, a "bedroom community may have a low GPCD, because it doesn't include much commercial or industrial water use, while the nearby industrial community has a seemingly excessive GPCD, because it has few residents to divide water use among."[207]

The WCAC, with the help of the TWDB, is working on developing on a standard GPCD measurement method. This committee anticipates that WCAC will have formal recommendation in their report as this topic is also included in the Sunset Commission staff recommendations.

Development of Desalination/ Aquifer Storage and Recovery

Desalination[208]

Although there has been much progress made with desalination, aquifer storage and recovery and conservation education, there are some hurdles that still exist. These challenges are generally related to cost, technology, byproducts and lack of incentives. These challenges can be overcome as progresses are made in the respective fields.

A common argument against desalination plants is how much energy is used in their operation. Desalination facilities require more energy than any other water supply option. Obviously, thermal treatment processes require the most energy, but reverse osmosis facilities also require additional energy to pressurize the source water and force it through the membrane. In the absence of a significant increase in the use of renewable energy sources, such as solar or wind energy, this increase in energy production would increase the use of fossil fuels, which in turn would increase pollution and greenhouse gas emissions.

On par with the elevated energy use in the desalination process is the high cost. The number one direct cost is energy. Depending on the process, energy can comprise from one third to one half of the total desalination cost. The California Coastal Commission estimates that a $0.01 increase in price per kilowatt-hour results in a $50 increase in the cost of producing one acre-foot of desalinated water. Pacific Institute estimates cost increases in a different manner; a 2 percent increase in energy cost increases the cost of produced water for reverse osmosis by 11 percent and for thermal, 15 percent. In *Water for Texas 2007*, desalination projects in Texas are estimated to cost an average of $1,351 per acre-foot or more than $4 per thousand gallons.

Finally, another challenge is presented by the byproduct of desalinated water. Brine, along with the chemicals used to prevent fouling and scaling, must be disposed of by desalination facilities. The biggest concerns are: 1) the ecological effects resulting from the disposal of brine from the desalination process; 2) the entrainment of aquatic species in and around the desalination facility intake; and 3) the increased energy required by the desalination process. Plants located on the coast often discharge directly into the coastal waters. This may involve discharging into a bay or estuary or into the ocean; usually, there is

no treatment of the brine before it is disposed. Some plants choose to mix their brine with the discharge of a nearby power plant in order to dilute the high salinity of the brine before it reaches the receiving waters. Some small- and medium-sized plants discharge their brine to the local sewage treatment plant. The most common method for brine disposal in the U.S. is surface water discharge by 45 percent. Disposal through sewer treatment facilities is used 27 percent of the time and subsurface injection is used 13 percent of the time. Disposal to land or by using evaporation ponds is used 12 percent of the time with recycling or reuse of the water used less than 2 percent.

Aquifer Storage and Recovery[209]

The next challenge associated with reuse and technologies relates to ASR. Incentivizing ASR in Texas provides some challenges. One obstacle to moving forward with this technology here is lack of protections and incentives. The TCEQ, the TWDB, and the Texas State Soil and Water Conservation Board will need to address issues that "will recognize the right to use new surface water and encourage brush management designed to restore water runoff for aquifer recharge, spring flows, and in-stream or environmental flows."

Implementation/ Consistency of Statewide Conservation Program

Finally, the hurdle with conservation education remains the lack of consistency in statewide programs. Texas has the *Water IQ* program, but it is not being used everywhere. There are other variations. When in better economic times, the state should invest in a broad-based water conservation education program. The Regional Water Plans are relying heavily on water conservation to meet future needs of Texans from all across and still is the most cost effective alternate to meet those needs.[210] In fact, in the 2007 State Water Plan, conservation accounts for nearly 23 percent of required water in 2060- a total of about 2 million acre-feet.[211]

RECOMMENDATIONS

Water Conservation Plans/ Drought Contingency Plans

Consider directing the TWDB and the TCEQ to require the development and implementation of WCPs and DCPs, and create enforcement measures to ensure compliance.

Water Conservation Advisory Council/ Gallons per Capita per Day

Monitor the progress and recommendations of the WCAC and support the standardization of the GPCD measurement.

Desalination, Recycled Water Resources, and Aquifer Storage and Recovery

Continue to examine the advancement and commercial viability of water conservation technologies like desalination, recycling, and aquifer storage and recovery across the state.

Study innovations and techniques that are being tested and deployed in other geological and hydrological conditions similar to Texas around the world.

Implementation/ Consistency of Statewide Conservation Program

Evaluate the effectiveness of existing conservation programs and enhance any statewide water conservation education programs developed through a local and regional planning process that considers the unique challenges facing different areas of the state.

Consider providing incentives to the public for participating in conservation practices.

Continue to encourage localities to initiate projects that promote water conservation.

REGULATORY MODEL FOR INVESTOR OWNED WATER AND SEWER UTILITIES

PUBLIC HEARING

The House Committee on Natural Resources held a public hearing on its Interim Charge #4 related to the regulatory model for investor owned water and sewer utilities on May 12, 2010 at 9:00 a.m. in Austin, Texas in the Capitol Extension, Room E2.012. The following individuals testified on the charge:

Orville Bevel, T.A.M.E.R
Steve Blackhurst, Aqua Texas, Inc.
Michael Farrell, Southern Utilities Company
David Frederick, Lowerre, Frederick, Perales, Allmon, Rockwell & Tamer
George Freitag, Southwest Water Company
Victoria Harkins, Self
Jim Boyle, Aldine Ratepayers Association
Thomas Hodge, Canyon Lake Water Service Company
Doug Holcomb, Texas Commission on Environmental Quality
Paul Metz, TAMER
Simon Sequeira, Quadvest, L.P.
Mark Zeppa, Independent Water and Sewer Companies of Texas

The following section of this report related to the regulatory model for investor owned water and sewer utilities is produced in large part from the oral and written testimony of the individuals listed above.

INTRODUCTION

Utilities in Texas are the most capital intensive industry, and water and sewer utilities are the most capital intensive of all utilities. For this reason, Texas has chosen to assert authority over water and sewer utilities through the Texas Commission on Environmental Quality (the "TCEQ"), charged with assuring rates, operations, and services that are just and reasonable to both customers and retail public utilities. This is a hard balance to accomplish between customers based on area and usage, usually rural, and public utilities that typically must generate revenue exclusively through customer rates. This committee has previously considered, and will continue to consider, more viable ways to match consumer costs with the regulatory compliance expenses of smaller water systems so that clean, affordable drinking water can be provided to all those who need and want it.

BACKGROUND

Agency Oversight / Statutory Regulation of Investor Owned Utilities

The state's regulatory agencies first became involved in rate regulation when the 1913 Irrigation Act provided broad general powers to set rates for waters of the state. On September 1, 1975, the Texas Public Utility Commission (the "PUC") was created to regulate telephone, electric, water, and sewer utilities. On March 1, 1986, portions of the Public Utility Regulatory Act related to the jurisdiction of retail water and sewer service were transferred from the Texas Utilities Code to the Texas Water Code (the "TWC"), and the authority over water and sewer utility regulation moved to the Texas Water Commission, a predecessor to the TCEQ.[212]

There are three types of entities that can provide water or utility service in Texas: public utilities, also known as investor owned utilities ("IOUs"); water supply or sewer service corporations ("WSCs"); and political subdivisions, which include water districts, municipalities, and counties. Under Chapter 13 of the TWC, all of these entities are defined as "retail public utilities," however, IOUs are further defined as "water and sewer utilities, public utilities or utilities," a subset of the retail public utilities.[213] For purposes of this report, the discussion is focused primarily on IOUs, also referred to in this report as public utilities.

Public utilities are typically monopolies in the areas that they serve. The TCEQ grants Certificates of Public Convenience and Necessity ("CCNs") that designate retail public utilities' service areas, in most cases making them the sole provider in the area. Utility regulation serves as a substitute for competition and the TCEQ has original rate jurisdiction over public utilities.[214]

Municipalities have original rate jurisdiction over public utilities operating within their corporate boundaries.[215] In these instances, the TCEQ has appellate jurisdiction over the municipality's rate making decisions affecting public utilities operating within its corporate limits. Additionally, the TCEQ has appellate jurisdiction over rates for out-of-city retail customers of a municipality, all district retail customers, all WSC customers, and retail

customers of affected counties as defined.[216] Last, the TCEQ has appellate jurisdiction over wholesale rates for potable water and sewer service as well as wholesale rates for surface water.[217]

Determination of Rates[218]

Chapter 13 of TWC charges the TCEQ with assuring "rates, operations, and services that are just and reasonable to the customers and to the retail public utilities." The basic principles of rate regulation are based on the concepts of fairness and equity without unreasonable discrimination. A retail public utility is entitled to an opportunity to earn a fair return on the value of property used in providing utility service.

IOUs or public utilities must file an application with the TCEQ or other regulatory authority having original jurisdiction and provide notice to its affected customers when proposing to change its rates. The public utility must provide notice at least 60 days before the proposed rates go into effect. The customers then have 90 days from the effective date to protest the proposed rates. If the lesser of 1,000 or 10 percent of the customers protest or the TCEQ staff has concerns with the proposed rate change, the matter is referred to the State Office of Administrative Hearings ("SOAH"), and a preliminary hearing is scheduled. Otherwise, the rates are approved administratively.

The regulatory model for IOUs used in Texas is known as the "Utility Basis" ratemaking methodology. The elements of the "Utility Basis" were established by the Supreme Court in *Bluefield Water Works Co. v. Public Service Commission*, 262 U.S. 679 (1923) and *Federal Power Commission v. Hope Natural Gas Co*., 320 U. S. 591 (1944). Under these decisions, each state must set an IOU's rates based on a revenue requirement. The revenue requirement is the amount of money the utility reasonably needs every year to provide service to customers. The basic formula is as follows:

Revenue Requirement	=	Reasonable Operation & Maintenance Expenses
		+ Depreciation on Utility Property
		+ Taxes
		+ Return on Rate Base (Invested Capital)
		+ Acquisition Adjustment (if any).

Texas has adopted these standards in TWC Sections 13.182 - 13.185 and Section 13.188.

Basic Rate Structures[219]

There are several different basic rate structures used in Texas including fixed or flat rates, variable rates, fixed-variable rates, and winter months averaging rates. Fixed or flat rates utilize only one charge no matter how much water is used. This design is typically used by sewer systems. It is also used by some small water systems that do not have customer meters,

but it is typically discouraged by the TCEQ because it does not encourage water conservation. A variable rate is a rate where there is no base charge. This design does not include a "demand" component so water is paid for as it is used. This rate structure does encourage conservation but also causes large revenue fluctuations for the public utility. Next, fixed-variable rates are determined by fixed costs used to calculate a monthly base rate which represents the demand the customer can put on the system via the meter size or customer class and may include a certain amount of gallons. The variable costs are used to calculate a volume charge for the actual water usage. This structure is the most commonly used and also encourages conservation. Many water and sewer utilities that use this type of design are moving toward a base rate with no amount of gallons included in the bill and incorporating an increasing block rate structure for the volume charge. Increasing block consumption rate structures include higher gallonage charges for the higher gallon block tiers, but they can increase financial risk and revenue fluctuations, such as winter versus summer or wet versus dry years, and do not always change customer usage patterns. Finally, winter months averaging rates are often used for sewer customers instead of a flat rate if water consumption data is available. The monthly sewer bill is allocated based on the average amount of water the customer used during the winter months. This provides a more accurate depiction of the amount of water the customer sends to the wastewater treatment plant year round because there is little or no outside watering, car washing, etc. done during the winter months.

Historical Test Year Method

Chapter 13 of the TWC establishes a rate setting method for public utilities based on a historical test year. The historical test year looks at actual expenses over a recent 12-month period and includes adjustments for known and measurable changes such as power, chemical, and salary expense changes to establish the public utility's reasonable cost of service.[220] Rates are set to be charged during the first year following an historical test year. However, the rates are based upon capital invested only during the test year. This means the public utility cannot begin to recover its intervening capital investment until a subsequent rate case.[221]

Under the historical test year method, there are a number of factors that affect revenues and expenses, as demonstrated by the following abbreviated list of factors:

Revenues Depend On	Revenue Requirements Depend On
Number of customers	Number of customers
Customer water usage	Customer water usage
Weather	Weather
Conservation	Conservation
Rate changes	Capital Needs
Price elasticity	Compliance

These and other factors will affect the viability of an IOU. Maintaining a stable or growing customer base provides revenues to assist with meeting the public utility's revenue requirements

or expenses. The IOU should also understand customer water usage patterns, the effects of weather changes, price elasticity, conservation and the effect of rate changes. Understanding and planning for changing capital needs in many cases is driven by changes in the TCEQ's requirements and the federal requirements in the Safe Drinking Water Act and Clean Water Act. Keeping up with these changes and staying in compliance with federal and state requirements is essential to a public utility's long term viability.[222]

Cost Based Rates/ Cost of Service Study

There is a perception in Texas that many IOUs charge more than utilities under other types of ownership, such as special utility districts or municipalities, and this is often supported by comparison of base rates between utilities. While there are countless reasons why rates differ between utilities such as tax structure, subsidies, cost of water, age of infrastructure, etc., there is one difference that many overlook: the rates of IOUs are based on cost of service.[223]

According to Chapter 13 of TWC and Chapter 291 of the TCEQ's rules, public utility rates must be cost based and may not be unreasonably preferential or prejudicial. Although there is a difference in the true cost to serve individual customers depending on how far they are from a well, elevation, etc., it is not practical to set a different rate for each customer. Therefore, rates are typically set by meter size since it represents the potential demand of the customer. Occasionally, different rates are set for different classes of customers with similar cost characteristics such as residential, commercial, or industrial users.[224]

A public utility is entitled to an opportunity to earn a reasonable rate of return on its investment in its plant and equipment. The rate base is essentially the public utility's original investment at the time the assets were placed in service less the accumulated depreciation. It also includes a working capital allowance which includes reasonable inventories of materials and supplies, reasonable prepayments for operating expenses, and an allowance up to 1/8 of operation and maintenance expenses. In recent years the TCEQ has typically allowed up to a 12 percent rate of return as a maximum rate of return. The return is not guaranteed to the utility and the TCEQ's rules require it to consider the public utility's financial soundness, conservation of resources, quality of service, operation, management, cost of capital, and other relevant conditions or practices. In addition, the TCEQ may consider inflation, deflation, growth rate of the service area and the need for the utility to attract new capital. It should, however, reflect the kind of return an investor would hope to receive on another investment with similar risks.[225]

When considering a rate change, a public utility needs to plan effectively to head off future problems. A cost of service study, which can vary in price, may identify the reasons for cost increases and may also help properly assign or allocate these costs. The study is also invaluable when trying to communicate the reasons for rate increases to customers. If a study identifies needs for major adjustments in how rates are allocated between the base bill and gallonage charges, it is usually wise to make the adjustments gradually to prevent rate shock and to allow customers to adjust usage patterns, if desired.

Some of the key components of a cost of service study for an IOU include operation and maintenance expenses, as well as depreciation costs. Operation and maintenance expenses are

the actual day to day expenses of running the public utility. The expenses may include but are not limited to salaries, contract labor, purchased water, chemicals, utilities, repairs and maintenance, office expenses, accounting and legal services and insurance. For depreciation of costs, the utility recovers its actual initial investment in its plant and equipment through depreciation using a straight line method over the projected useful life of the asset. For example, distribution lines have a recommended service life of 50 years which means that if a utility invested $1,000,000 on the distribution system, a portion of the IOU's total annual depreciation expense would include $20,000 (1,000,000/50) to account for recovery of the cost of the distribution system.[226]

Interim Rates and Suspended Rates[227]

Currently, the TCEQ Commissioners, and not the Executive Director, can set interim rates under Chapter 13 of TWC to remain in effect during the pendency of the rate case or require that rates be escrowed. In instances where an increase could result in unreasonable economic hardship or in unjust or unreasonable rates, interim rates can be set by the Commissioners or SOAH. In some cases, the final rates may be higher than the interim rates resulting in customers paying the new rates plus a surcharge to make up the difference.[228]

If a rate application or statement of intent is not substantially complete or does not comply with the TCEQ rules, the TCEQ can suspend the rate change until the applicant provides a properly completed application or a proper statement of intent. The TCEQ can also suspend the rate change for up to 150 days after receiving the requisite number of protests to send the matter to SOAH. The public utility cannot collect or recover the proposed revenues during the period rates are suspended.

Rate Case Process and Timing

While a high percentage of rate cases are settled without a contested case hearing, those that do go through the process can prove to be extremely lengthy and very costly to both the companies and, ultimately, the customers.[229] Chapter 13 of TWC allows public utilities to place their proposed rates in effect 60 days after proper notice is provided to affected customers and to continue charging the proposed rates while the case proceeds through the hearing process. Customers can see how their utility bill will be impacted by the proposed change and the utility can begin to cover expenses. Refunds plus interest are required if the proposed rates are not granted.[230]

As a regulated entity, IOUs must present convincing evidence that their proposed rates are both reasonable and necessary in order to have their rates approved. Rate applications filed with the TCEQ provide the TCEQ staff and customers with documentation and justification for operational and maintenance expenses and capital investments. Texas has an additional advantage in that the same regulators who review and establish rates also regulate the quality of service to customers, establish minimum operational and capacity requirements, and ensure environmental compliance for the IOUs. The TCEQ is in a unique position to ensure that capital investments are in fact prudent investments.[231]

In order to change rates, IOUs must go through the process of notification and filing spelled out in the TCEQ rules. The minimum time until a public utility knows for 100 percent certainty that its rates are approved can occur a half a year after the application is filed. If at any time in the process a rate request goes to hearing, the total time elapsed can be much greater. This timeline includes:

- Customer notice is provided by the IOU via the TCEQ format or a separate mail out;
- Protests from the lesser of 1,000 or 10 percent of customers can trigger a rate case;
- The TCEQ Executive Director may individually protest and trigger a rate case;
- The TCEQ requires all expenses to be supported by actual invoices with costs based on historical test year for work completed and in service;
- Rate case settles or is contested;
- Contested cases go before SOAH followed by administrative procedure requirements; and
- Rates are approved by the TCEQ.

Eventually, depending on the findings of the proceedings, the utility rate increase is limited to the proposed increase in revenues put in the notice; customers are credited if final rates are determined to be less.[232]

Rate Case Expenses

Rate case expenses are often a necessary evil to all involved in the process: the customer, provider, and agency. The TWC requires a public utility to follow specific procedures to increase rates to cover its cost of operations. As a regulated entity, courts have held that the public utility should be allowed to recover its reasonable and necessary rate case expenses. However, under the current open timeframe for processing a case, there is the potential for unnecessarily high levels of rate case expenses to be generated. Currently, the TCEQ has the discretion to determine what rate case expenses are reasonable and necessary. Only by reviewing the specific circumstances or each case can the amount of reasonable expenses and the appropriate method of recovery be determined. In addition, rate cases can be extremely costly for the agency as well. For example, specifying the cost of an application filing fee in Subchapter L of Chapter 13 of TWC ($500 for any utility above 500 customers) limits the ability of the TCEQ to establish reasonable application filing fees or adjust fees over time and limits the availability of the legislature to appropriate funds to properly staff the public utility program.[233]

Consolidated Rate System

IOUs often operate a number of separate, unconnected utility systems, but when they have similar physical and operational cost characteristics, the public utility will typically request a system-wide or single tariff rate otherwise known as consolidated rate, for all of its systems. A consolidated rate is the use of a unified rate structure for multiple water utility systems that are owned and operated by a single utility. These systems may or may not be contiguous or physically interconnected. Under single tariff pricing, all customers of the utility would pay the same rate for the same service, even though the individual systems providing the service may vary in terms of operating characteristics and stand alone costs.[234]

In 2001, Texas enacted TWC Section13.145 which limits an IOU's ability to spread costs to all customers, thereby reducing their impact on any single customer group. Chapter 13 of TWC requires that consolidated rates can be set only if the public utility can demonstrate that similar conditions exist in the systems. Chapter 13 of TWC also provides an exemption from this requirement if the public utility was serving in 24 counties on January 1, 2003.[235] In general, systems must be substantially similar with respect to facilities, quality, and cost of service to consolidate systems under the same rate.

Customer Participation

Customers frequently do not understand how a utility's revenue requirement is determined or how rates are designed, but they do understand how they are impacted by the rates. It is essential that a utility effectively communicates with its customers the true cost of service and the constraints it faces related to supply, demand and the need for capital improvements. Failure to effectively communicate, especially before a rate increase is requested, could result in a contentious public hearing process.[236]

Currently, IOUs are required to provide a formal notice of a rate change and the opportunity to request a hearing. Public utilities are not required to, but may also use bill stuffers, public service announcements, community events, and tours prior to filing a rate case to ensure consumer participation in their respective areas. Despite formal notice requirements, most hearings are held in Austin, Texas which can hinder a customer's ability to further participate in the process.[237]

In addition, some public utilities such as CLWSC have encouraged public participation through public meetings and educational efforts. The result has been good relations with customers and local officials, as well as relatively uncontroversial rate settlements. CLWSC encourages other public utilities to take a similarly proactive approach toward customer participation. Good customer relations provide their own reward.[238]

One area where customers can effectively participate in the ratemaking process is in negotiating settlements. Most settlements are "black box" and focus only on what customers are willing to pay and what IOUs can afford to accept. Ninety percent of contested water utility rate cases settle before trial. The use of settlement negotiations, whether directly between parties or through formal mediation, is encouraged.[239]

DISCUSSION AND CHALLENGES

Historical Test Year

Texas uses a historical test year for ratemaking and requires public utilities to provide actual costs for operation for the past 12 months for a rate increase. Several challenges were presented in testimony before the committee based on historical test year, full cost pricing and fiscal business practices.

First, nowhere in the rules does legislation allow utilities to use a future test year or years. Public utilities must pick a test year in which to provide costs to justify their rate increase applications. The historical test year concept operates under the basic principle that the money must be spent before it can be included in rates. Much energy is then spent in rate proceedings to determine if the historical costs truly reflect a representative year.[240]

Therefore, a forward looking test year should be considered. The forward looking test year has the premise that rates should reflect the costs during the period the rates are most likely to be in effect. There could be additional filing and proof requirements associated with a future test year to assure that any projections are reasonable. Cost of service adjustments based on a forward looking budgeting approach more nearly reflect current economic conditions.[241]

Second, utilities cannot obtain full cost pricing by basing their rates on historical prices. Utilities find themselves recouping their costs, but only in arrears, and since the cost keeps escalating the capital is never truly recovered. A test year that has both historical and forward looking budget would allow full cost pricing and promote efficient use by customers. [242]

Third, incentives for fiscal business practices should be encouraged. For example, one public utility just negotiated a two year contract from its electric provider that reduced electricity cost by 22 percent. Public utilities bid out inventory annually to insure the lowest prices, but if prices go up after a historical test year in a rate case, then it is punished for trying to run an efficient business. There should be a forward looking budget that assists in setting rates that will incentivize utilities to cut cost, rely more on technology for efficiency, and enhance good business decisions.[243]

Rate Case Process and Timing

Numerous challenges surrounding the rate case process and timeline. These include the effective date for new rates, the timeline for the rate case process, and rate case expenses. Typically, the rates requested by the utility are put into effect on the 60th day after filing without any hearing. Water/wastewater ratepayers can request a suspension of the rates by the lesser of 1,000 or 10 percent of the utility's customers filing a complaint with the TCEQ. However, such a request has never been granted. On one hand, the concern is that if a public utility is granted its complete rate increase request within 60 days, it has little incentive to push the rate case to a rapid conclusion. Automatically implementing the public utility's requested rate increase on the 60th day from filing its request is not necessary to prevent the water/wastewater utility from

being financially harmed by TCEQ's approval process, particularly if the length of the process was shortened similar to that for electric and gas rate cases.[244]

Secondly, the rate case process can be extremely time consuming. Rate cases take anywhere from one and a half years to three years to complete at the TCEQ. More recently, one rate case filed with the TCEQ lasted more than four years. As a general rule, the longer a rate case takes until a final decision is issued the greater the total cost for rate case expenses. It is believed that some changes to the rate application and rate hearing process are needed and would benefit customers, the TCEQ, and utilities.[245]

In contrast, other agencies, such as the Public Utility Commission and the Railroad Commission, must complete the entire ratemaking process within 185 days for electric and gas utility rate increase requests, respectively (Note: This was previously a statutory requirement for the TCEQ for water and sewer utility rate cases, however, in the early 1990's the legislature removed this requirement from the TWC). In addition, as a matter of practice and procedure, rates are suspended at both agencies for an additional 150 days from the initial effective date, which most often occurs on the 35th day after filing of the application for an increase in rates. Both agencies recognize that it is impossible to review an application to increase rates in such short a time frame. With the 185 day deadline, discovery is completed in the first 90 days, the hearing is held around the 100th day, and the proposal for decision is issued by SOAH or the agency between the 150th and the 160th day, giving the Commissioners for the two agencies somewhere between twenty-five to thirty-five days to issue a final decision. This time frame saves rate case expenses and it gets any increase in rates to the public utility in rapid fashion. It also avoids taking the property of ratepayers, through higher rates, without some form of due process.[246]

As a side note, the current one-year moratorium between rate change applications is reasonable since there is an exemption for extreme financial hardship cases. If a longer period is imposed, a more flexible exemption is needed. Furthermore, IOUs that are not in receivership should be allowed to file for emergency rate increases. Currently this opportunity is only available to public utilities under a court-ordered receivership.[247] Ultimately, rate case expenses could be significantly curved by lessening the timeline for rate case proceedings and encouraging the settlement of contested cases.

Consolidated Rate System

Drinking water and wastewater systems are facing an ever-increasing demand on their resources to stay in compliance with provisions of the federal Safe Drinking Water Act and federal Clean Water Act. The costs associated with compliance are higher per person as the system size decreases (*See* The Feasibility of Regionalizing Water and Wastewater Utilities – A TCEQ Policy Statement). The Environmental Protection Agency estimates that water systems serving under approximately 1,000 connections generally lack the economy of scale to sustain themselves (*See* EPA-NARUC Document 1999). A consolidated rate system is a means to provide the economy of scale to allow small water systems to operate in compliance with federal, state and local requirements.[248]

Proponents of a consolidated rate system believe that public utilities build their water systems with the conviction that a regional, interconnected system better serves customers than small, isolated systems. The benefits of a consolidated rate system accrue to both the utility and their customers due to the economies of scale inherent in utility infrastructure costs and the improved reliability of supply. Additional savings result from more efficient use of staff, billing and customer service systems. For many public utilities, costs are averaged among customers within classes, without regard to variations in the cost of service associated with differences in elevation or different water sources and facilities. A consolidated rate system benefits existing and future customers by stabilizing rates, making rates more affordable in the smaller rate districts, and facilitating investment in water supply infrastructure and water treatment facilities (from findings from the California PUC).[249]

On the other hand, critics of a consolidated rate system argue that one system should not subsidize another. In some cases, the public utilities are substantially different from one another with systems ranging in size from less than 30 connections to more than 500 connections; systems purchasing groundwater versus others utilizing surface water; and systems that are brand new versus others that are 30 years or older eventually. In these instances, the TCEQ should deny the application based on an inability to demonstrate how the systems are substantially similar. However, some believe that the TCEQ has previously consolidated systems with little or no demonstration of the requirements of TWC Section 13.145, i.e. Texas Landing Utilities. In other instances, the TCEQ has allowed the consolidation of hundreds of systems based in the theory that's these systems would be substantially similar prospectively or in the future. If TWC Section 13.145 was intended to be applied prospectively, then all public utility systems in the state could be consolidated because all systems in the state will be the same eventually.[250]

Lastly, the TCEQ should be encouraged to update its rate case application and guidance documents. The rate application currently available from the TCEQ is dated November 2002, and it does not request any data or presentation of data to address the requirements of TWC section 13.145.[251] Further, the current staff guidance document of rate making is dated April 28, 2000. There is no guidance to either staff or the public on how the TCEQ addresses the requirements of TWC Section 13.145.

In conclusion, many IOUs prefer a consolidated rate system because it may simplify record keeping and enable utilities to make capital improvements that might not be supportable if each system operated as a stand-alone operation. However, it is also necessary to consider whether the costs of operating the systems involved are so different that it would be unfair to set the same rate for all.[252]

Customer Participation

Most water/ wastewater customers of IOUs are located in rural areas, outside the boundaries of any municipalities. Often, these customers lack the resources to effectively participate in complex, lengthy ratemaking proceedings.[253] In these instances, public meetings held in the local area held by the TCEQ could be beneficial in getting a sense of customer concerns so that they can be addressed in the hearing process.[254]

Next, effective notice of rate impacts could be communicated if Section 187 (a) were not so specific about billing comparisons which are not appropriate for some systems, but instead directed the TCEQ to include information in the notice to help customers understand the impact on their rates. A comprehensive approach is probably best which may include communications to explain the public utility's infrastructure needs; the need for rate relief as a result of the economic and environmental challenges to the water industry, and the importance of wise water use, as well as its impact on infrastructure and availability of reliable supplies in the future.[255]

Last, improvements in the settlement process could also reduce unnecessary rate case expenses. Frequently, as cases proceed through the hearing process, settlement negotiations take place. In some of the most recent rate case proceedings, the customers, public utilities, and the TCEQ were able to agree on the rates that should be charged. However, one individual customer or small group of customers refused to settle. Even though the customer or customer group may have no substantive testimony to offer in the hearing, they can require the public utility and TCEQ to present their entire cases. The process then continues through the administrative law judge's decision and to the TCEQ Commissioners for a final determination. This extra time and expense necessitated by the full blown hearing are then spread over all customers, even those who originally agreed to settle.

Therefore, an option for the judge to refer the case back to the TCEQ Commissioners with a partial settlement should be considered. This option would give the TCEQ Commissioners the opportunity to make a decision on whether to accept the settlement, go forward with a full hearing, or limit the issues to be considered at a hearing.[256] Ultimately, the settlement negotiation process should be streamlined to save both parties this expense. Clear settlement negotiation timelines and rules that better protect the majority of ratepayers from a small but obdurate minority would improve the process.[257]

Overall Cost Reductions

The typical mindset of public utility customers is that the rates charged by IOUs far exceed those comparable rates charged by WSCs, municipal utility districts, municipalities and other classes of water and sewer utilities. Although comparing the rates of an IOU with these other classes of utilities is much like comparing apples to oranges, there exists evidence which proves this is simply not the case.[258] Since the late 1970's, Texas has limited IOUs the timely opportunity to recover their capital investment. The cost of water production plant financed with 10-year bank loans is recovered through 50-year service lives. IOUs could not keep up with growth in customer demand and service suffered. In 1997, Texas embarked on a policy of system consolidation and encouraged larger IOUs to acquire and improve smaller systems. Tens of millions of dollars were invested in system upgrades. It is the recovery of these state encouraged and state ordered investments that have caused the large rate increases leading to public outcry.[259]

Accounting[260]

Sometimes the keeping and presentation of accounting records can become an issue in the rate case process. The TCEQ should consider revising its rules to incorporate certain

clarifications to the manner and form of accounting record; otherwise, these clarifications should be included in Chapter 13 of TWC. For example, Aqua Texas keeps its records according to a nationally accepted system, the National Association of Regulatory Commissioners (the "NARUC") chart of accounts. Currently, even though TCEQ rules approve the NARUC system, the TCEQ requires a public utility to change its accounting records for purposes of a rate change application to an alternative system at a substantial increase in cost to the public utility. The alternative system is appropriate for small utilities, but it does not work well for larger utilities.

Low-income Affordability Rates[261]

Another overall cost reduction or best management practice for public utilities should be for the development a system for low-income affordability rates. There are some situations where customers are truly in need of assistance and cannot pay the costs for public utility services. Currently, the TCEQ rules nor statute do not allow programs for assistance to customers on either a short-term or long term basis that are in effect a cross-subsidy between customer classes. The option of programs such as "life-line" rates or "low-income assistance" rates can be effectively administered if allowed by the agency or legislature.

Operations, Maintenance, and Depreciation

Attention to the operations, maintenance and depreciation methods for public utilities could also be helpful in overall cost reductions. This can be accomplished by addressing life-cycle costs and ongoing maintenance to meet the needs of current and future users as well as increasing and improving infrastructure investment from all stakeholders. Many public utility systems fail to fully account for plant depreciation and replacement needs in their accounting and, therefore, do not include these costs in their rates. The result is postponed maintenance and insufficient funding to replace aging infrastructure, resulting in declining levels of service.[262]

In addition to the depreciation of the original cost and return on rate base, a public utility that purchases another utility at a price higher than the net book value (original cost less accumulated depreciation) may be eligible for a positive acquisition adjustment. A positive acquisition adjustment, if granted, would allow recovery of the difference between the purchase price and the net book value in a straight line manner over the weighted average remaining useful life of the assets at an interest rate equal to the rate of return.[263]

Infrastructure Cost Reductions through Limited Eminent Domain[264]

Next, improving service in existing systems can be very costly, if not impossible, especially without limited powers of eminent domain. IOUs have no power to compel a landowner to allow the lease or purchase of property at any price for a new well or pipeline improvement easement which greatly limits their ability to upgrade facilities for customers to meet the TCEQ requirements. Customers ultimately suffer with inadequate facilities or service which does not meet the TCEQ requirements or pay unnecessarily high rates if a property owner demands an unreasonably high amount from the utility. In past sessions, a limited power

of eminent domain for sanitary sewer easements and water well locations/ easements has been requested. These items are governmental requirements and not discretionary for public utilities. IOUs need some limited power, perhaps with the TCEQ's authorization, in order to obtain necessary land or easements to provide service to customers.

System Infrastructure Improvement Charge[265]

Finally, cost reductions for utilities can be accomplished through a system surcharge which allows public utilities to replace infrastructure as needed or required by EPA or the state, t improve reliability, and create solutions to regional water supply problems in a timely, cost-effective manner. In Texas, the timeframe for public utilities to upgrade their existing, aging infrastructure easily exceeds 50 years. Upgrades of deteriorated mains are essential to reduce main breaks, service interruptions and unaccounted for water, as well as improve water quality, improve pressure, enhance fire protection, and achieve rate stability. The surcharge allows a public utility to accelerate investment in needed infrastructure projects that improve health, safety, and reliability, which are typically not the primary concern in a base rate case. Eligible projects include: wells, treatment works, services, meters, hydrants, mains, and valves installed as in-kind replacements; main extensions installed to eliminate dead ends and to address regional water supply problems; main cleaning and relining; and costs to relocate facilities, wastewater collection and treatment.

The System Infrastructure Improvement Charge is not intended to bypass the traditional ratemaking process. Costs recovered are subject to the TCEQ's auditing powers and an annual reconciliation report which compares revenue received to eligible costs. The surcharge resets to zero as of the effective date of new base rates and the amount of surcharge is capped to prevent any long term evasion of a base rate review of plant costs. The program is limited to those capital expenditures that currently require TCEQ review and approval prior to implementation. In conclusion, the surcharge has the potential to reduce rate-case expenses by extending the time between future base rate filings.

RECOMMENDATIONS

Historical Test Year

Continue to examine the interplay between historical test year and forward looking methodologies for setting public utility rates.

Rate Case Process and Timing

Provide certainty and clarity to customers and utilities by directing the regulatory agency to develop timelines for public utility rate case proceedings that are more concise and follow the rate proceedings for other regulated utilities.

Consolidated Rate System

Continue to explore options through the regulatory agency and/or legislature for better enabling consolidated rates between substantially similar systems at the regional level through the development and/or clarification of the regulatory agency's application and guidance documents, as well as other rules and/or statutes.

Customer Participation

Enhance customer participation and representation during the rate case process by directing the regulatory agency and/or legislature to offer public meetings more convenient to local stakeholders and to develop standardized forms and notice requirements.

Consider streamlining rate cases that receive a majority of support from all parties through options like a partial settlement.

Overall Cost Reductions

Continue to explore overall cost reductions through the regulatory agency and/or legislature for the improvement of a public utility's accounting, operations, maintenance, and depreciation methodologies, as well as allow public utilities the ability to construct low-income affordability rates among other infrastructure cost reductions.

ENDNOTES

[1] Tex. Gen. Laws 1949, Ch. 306.

[2] Figure 56, Underground Water Conservation Districts, Texas Water Commission, Dec.1988 map.

[3] Cite Figure 4, Groundwater Conservation Districts, Natural Resources Conservation Commission, Dec. 1998 map.

[4] Cite February 2010, Texas Water Development Board, Groundwater Conservation Districts (confirmed and pending).

[5] Oral and Written Testimony of Edmond R. McCarthy, Jr., Jackson, Sjoberg, McCarthy & Wilson, L.L.P., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, April 15, 2010.

[6] *Houston & Texas Central Railway Co. v. East*, 81 S.W. 279 (Tex. 1904).

[7] 12 Mees & W (1843).

[8] *East*, 81 S.W. at 280.

[9] *Id.*

[10] *See Friendswood Dev. Co. v. Smith-Southwest Indus., Inc.,* 576 S.W.2d 21, 25-27 (Tex. 1978); *City of Del Rio v. Clayton Sam Colt Hamilton Trus,* 269 S.W.3d at 617-618 (Tex. App.-San Antonio 2008 pet. filed).

[11] *See City of Sherman v. PUC*, 643 S.W.2d 681, 686 (Tex. 1983).

[12] TEX. CONST. ART. XVI, § 59.

[13] *Id*.; *see City of Corpus Christi,* 276 S.W.2d 798, 803 (1955).

[14] 296 S.W. 273 (Tex. 1927).

[15] *Id*. at 278 (emphasis added).

[16] *See* TEX. CONST. ART. XVI, § 59; *City of Corpus Christi,* 276 S.W.2d at 803.

[17] *See generally City of Corpus Christi,* 276 S.W.2d at 802-803.

[18] *See id.* at 802.

[19] *See id.*

[20] *Id*.

[21] *Id*. at 803.

[22] Tex. Gen. Laws 1949, Ch. 306.

[23] *See* TEX. SPECIAL DIST. LOCAL LAWS CODE Chapter 8801.

[24] *See Pecos County WCID No. 1 v. Williams*, 271 S.W.2d 503 (Tex. Civ. App.—El Paso 1954, writ ref'd n.r.e.).

[25] *Id.*

[26] *Pecos County WCID No. 1*, 271 S.W.2d at 505.

[27] 576 S.W.2d 21 (Tex. 1978).

[28] *Id*. at 30.

[29] *See Denis v. Kickapoo Land Co.*, 771 S.W.2d 235 (Tex. Civ. App.–Austin 1989, writ denied).

[30] *Id.*

[31] *Id*. at 238.

[32] 1 S.W.3d 75 (Tex. 1999). This case is commonly referred to as the "*Ozarka*" case.

[33] *Id.* at 80; *see* TEX. CONST. Art.XVI, § 59.

[34] *Id.* at 79 (*citing* TEXAS WATER CODE §36.0015).

[35] TEXAS WATER CODE § 36.002 (emphasis added).

[36] *See* Acts of 2005, 79th Leg. R.S., Ch. 970, 2005 Tex. Gen. Laws 3249.

[37] *See* TEXAS WATER CODE §§ 36.108, 36.3011; *see generally id.* § 36.001 (13), (25).

[38] TEX. CONST. ART. XVI, §59.

[39] *Sipriano v. Great Spring Waters of America*, 1 S.W.3d 75, 79 (Tex. 1999); *see* TEXAS WATER CODE § 36.0015.

[40] *City of Corpus Christi,* 276 S.W.2d at 803; *see* TEX. CONST. ART. XVI, § 59.

[41] 31 TEXAS ADMINISTRATIVE CODE ANN., §356.

[42] TEXAS WATER CODE ANN., §§16.051, 16.053, §16.054.

[43] Texas House of Representatives, Committee on Natural Resources, Interim Report to the 78th Legislature, (2002).

[44] Oral and Written Testimony of Robert Mace, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, April 15, 2010

[45] TEXAS WATER CODE ANN., §16.053(e).

[46] TEXAS WATER CODE ANN., §36.1072.

[47] Oral and Written Testimony of Robert Mace, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr.15, 2010.

[48] TEXAS WATER CODE ANN., § 36.001 (25).

[49] 31 TEXAS ADMINISTRATIVE CODE ANN., § 356.2 (13); Oral and Written Testimony of Edmond R. McCarthy, Jr., Jackson, Sjoberg, McCarthy & Wilson, L.L.P., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[50] TEXAS WATER CODE ANN., § 36.108(l) - 36.108(n); 31 TEXAS ADMINISTRATIVE CODE ANN., § 356.41-356.46; Oral and Written Testimony of Robert Mace, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr.15, 2010.

[51] Oral and Written Testimony of Robert Mace, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[52] *Id.*

[53] Oral and Written Testimony of Carolyn Brittin, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[54] Oral and Written Testimony of Cary Betz, Linda Brookins, and Kelly Mills, Texas Commission on Environmental Quality, Water Supply Division, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr.15, 2010.

[55] TEXAS WATER CODE ANN., §36.108(a) – (d).

[56] *Id.* §36.108(l) – (p).

[57] *Id.* § 36.108(f).

[58] *Id.* §36.108(g).

[59] *Id.* §36.108(i).

[60] *Id.* § 36.108(i).

[61] *Id.* § 36.108(j)-(k).

[62] *Id.* §36.108(k).

[63] *Id.* §36.3011; *see generally Id.* §36.108(k); Oral and Written Testimony of Edmond R. McCarthy, Jr., Jackson, Sjoberg, McCarthy & Wilson, L.L.P., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[65] Oral and Written Testimony of Luana Buckner, Edwards Aquifer Authority, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[66] Oral and Written Testimony of Robert Gulley, Edwards Aquifer Recovery Implementation Program, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[67] Oral and Written Testimony of Russell S. Johnson, McGinnis, Lochridge &Kilgore L.L.P, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[68] *Id.*

[69] Oral and Written Testimony of Dewey Hukill, Texas Farm Bureau, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[70] TEXAS WATER CODE ANN., §36.012.

[71] *See generally Id.* A map prepared by TWDB identifying the existing groundwater districts across Texas is available online at *www.twdb.state.tx.us/maping/maps/pdf/gcd_only_8x11.pdf* (last visited Sept. 12, 2010).

[72] TEXAS WATER CODE ANN., § 35.001; *see generally Id.* § 35.004.

[73] Texas Water Development Board, GCD Facts, *www.twdb.state.tx.us/gwrd/gcd/facts.htm* (last visited September 12, 2010); Oral and Written Testimony of Edmond R. McCarthy, Jr., Jackson, Sjoberg, McCarthy & Wilson, L.L.P., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[74] Oral and Written Testimony of Jim Conkwright, High Plains Underground Water Conservation District No. 1 and Texas Alliance of Groundwater Districts, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[75] Oral and Written Testimony of Andrew H. Backus, Hays Trinity Groundwater Conservation District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, April 15, 2010.

[76] Oral and Written Testimony of Robert R. Puente, San Antonio Water System, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[77] Oral and Written Testimony of Russell S. Johnson, McGinnis, Lochridge &Kilgore L.L.P, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[78] Oral and Written Testimony of Kirk Holland, Barton Springs/Edwards Aquifer Conservation District, General Manager, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[79] Oral and Written Testimony of Ray Buck, Upper Guadalupe River Authority, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[80] Oral and Written Testimony of Caroline Runge, Manager, Menard County Underground Water District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[81] Oral and Written Testimony of Robert R. Puente, San Antonio Water System, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[82] *Id.*

[83] Oral and Written Testimony of Russell S. Johnson, McGinnis, Lochridge &Kilgore L.L.P, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[84] TEXAS WATER CODE ANN., § 36.108(d).

[85] *See generally id.* § Ch. 36.

[86] 31 TEXAS ADMINISTRATIVE CODE ANN., §356.2(8).

[87] TEXAS WATER CODE ANN., § 36.108(f); 31 TEXAS ADMINISTRATIVE CODE ANN., §356.2(17).

[88] 31 TEXAS ADMINISTRATIVE CODE ANN., §356.2(17).

[89] TEXAS WATER CODE ANN., § 36.108(l).

[90] *Id.*

[91] *Id.* §36.108(m); *see* 31 TEXAS WATER CODE ANN., § Ch. 356 (rules related to "Groundwater Management").

[92] *Id.*

[93] Texas Water Development Board, Mapping, *www.twdb.state.tx.us/mapping/maps/pdfpublications/shells/DFCSpetition.pdf* (last visited Sept. 12, 2010).

[94] Texas Water Development Board, Shells Petition Process Flochart, *www.twdb.state.tx.us/mapping/maps/pdfpublications/shellspetitionprocessflochart.pdf* (last visited Sept. 12, 2010).

[95] Texas Water Development Board, Procedures for Board Deliberations on Appeals of Desired Future Conditions *www.twdb.state.tx.us/BoardMembers/2010/January/WorkSession/ws05hearing.pdf* (last visited Sept. 12, 2010).

[96] Texas Water Development Board, Mapping, *www.twdb.state.tx.us/mapping/maps/pdf/GMA%208x11.pdf* (last visited Sept. 12, 2010).

[97] Texas Water Development Board, Report on Appeal of the Reasonableness of the Desired Future Condition Adopted by the Groundwater Conservation Districts in Groundwater Management Area 9 for the Edwards-Trinity (Plateau) Aquifer, *www.twdb.state.tx.us/BoardMembers/2010/January/Special/spec01DFCs.pdf* (last visited Sept. 12, 2010).

[98] Texas Water Development Board, Texas Water Development Board Rules On Groundwater Management Area 1 Desired Future Conditions, *www.twdb.state.tx.us/publications/press_releases/2010/02/pr_GMA1_DFCS.pdf* (last visited Sept. 12, 2010).

[99] TEXAS WATER CODE ANN., § 36.108(n).

[100] *Id.*

[101] Oral and Written Testimony of Russell S. Johnson, McGinnis, Lochridge &Kilgore L.L.P, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[102] Oral and Written Testimony of Ronald G. Fieseler, Blanco-Perdernales Groundwater Conservation District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010 (excerpt includes partial section).

[103] Oral and Written Testimony of Janet Guthrie, Hemphill Underground Water Conservation District, GMA 1, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[104] Oral and Written Testimony of Kathy Jones, Lone Star Groundwater Conservation District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[105] Oral and Written Testimony of Edmond R. McCarthy, Jr., Jackson, Sjoberg, McCarthy & Wilson, L.L.P., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[106] Oral and Written Testimony of Ray Buck, Upper Guadalupe River Authority, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[107] Oral and Written Testimony of Andrew H. Backus, Hays Trinity Groundwater Conservation District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[108] Oral and Written Testimony of Janet Guthrie, Hemphill Underground Water Conservation District, GMA 1, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[109] Oral and Written Testimony of Robert Mace, Texas Water Development Board, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[110] Oral and Written Testimony of Kathy Jones, Lone Star Groundwater Conservation District, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[111] Oral and Written Testimony of Russell S. Johnson, McGinnis, Lochridge &Kilgore L.L.P, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[112] Oral and Written Testimony of Robert R. Puente, San Antonio Water System, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[113] Oral and Written Testimony of Caroline Runge, Groundwater Management Area 7, Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

[114] Oral and Written Testimony of Martin W. Jones, Sprouse Shrader Smith P.C., Public Hearing, Texas House of Representatives Committee on Natural Resources, Austin, Texas, Apr. 15, 2010.

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