

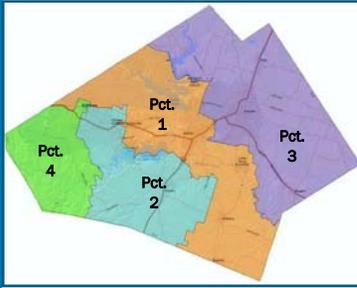
Clearwater Source

2015 Annual Newsletter | Volume 11, Issue 1 | October, 2015

In This Issue >>>

| | |
|-------------------------|---|
| District Well Data | 2 |
| Edwards BFZ Study | 2 |
| Middle Trinity Study | 3 |
| District Well Update | 5 |
| Single County Districts | 5 |
| Manager's Comments | 6 |

Clearwater Precincts >>>



DIRECTORS & TERMS:

Leland Gersbach—Precinct 1
(President)

Gary Young—Precinct 2
(Director)

Wallace Biskup—Precinct 3
(Vice President)

Judy Parker—Precinct 4
(Secretary)

David Cole—At large
(Director)

BELL COUNTY WATER SYMPOSIUM

November 19, 2015
CTCOG Building,
2180 N. Main St
Belton, Texas

Preregistration requested, please call the office now to reserve a seat!

Call 254-933-0120

A MESSAGE FROM THE PRESIDENT

What a year this has been for our water! The year has seen our lake levels close to all-time lows and then in a matter of weeks being 14 feet above normal. We went from a dry first part of the year to have our total annual rainfall by the end of June. Today we have parts of Bell County in the three drought designations of moderate, severe and even extreme in the eastern part of the county. We have a prediction of a strong El Nino meaning a wetter than normal winter. This year has been a classic example of why we should conserve our precious water resources.

This past year has had your Clearwater staff more on a normal schedule. We con-

tinue to strive to obtain the science necessary to better understand and manage our two aquifers. The District also has a very aggressive education program to work with area schools to educate our kids on conserving water. We can also provide a program on our District and aquifers to your club or organization, so keep us in mind if you need a very interesting program. Remember also that we provide



(Continued on page 5)

SALADO SALAMANDER UPDATE FOR 2015

The Texas Fish and Wildlife Conservation Office (TXFWCO) began monitoring the Salado salamander in February of 2015 to gather data on the distribution of salamanders within the Salado springs complex and on private property of the Robertson estate. While the main focus during this effort is to examine the distribution of salamanders within the spring complex, other tasks accomplished during the surveys include: occupancy estimations within the spring complex, measures of abundance for adults and juveniles, habitat associations within each site, habitat availability per site, contaminants within water, and surface recruitment of salamanders from subterranean environments. Other aspects related to the monitoring include information about the community of aquatic invertebrates within the aquifer.

The TXFWCO has been monitoring all five major springs near downtown and along the edge of Salado Creek, however salamanders have only been documented at two of these springs. Overall, salamanders have been detected at two historical localities (Big Boiling and the Robertson estate)



Salado Salamander

and one new locality for these salamanders, Anderson spring. Finding a salamander at this new locality highlights the connectivity of the springs along Salado Creek. Salamanders found during these surveys (n = 5) have been associated with gravel and cobble type substrates, with filamentous algae or *Ludwigia* sp. (aquatic plant). All salamanders detected during these surveys have been juvenile salamanders (< 25 mm).

Pete Diaz, Aquatic Biologist and Invertebrate Specialist with Texas Fish and Wildlife Conservation Office

CONTRIBUTING TO THE "KNOWNs OF THE NORTHERN SEGMENT": THOUGHTS OF A STUDENT RESEARCHER

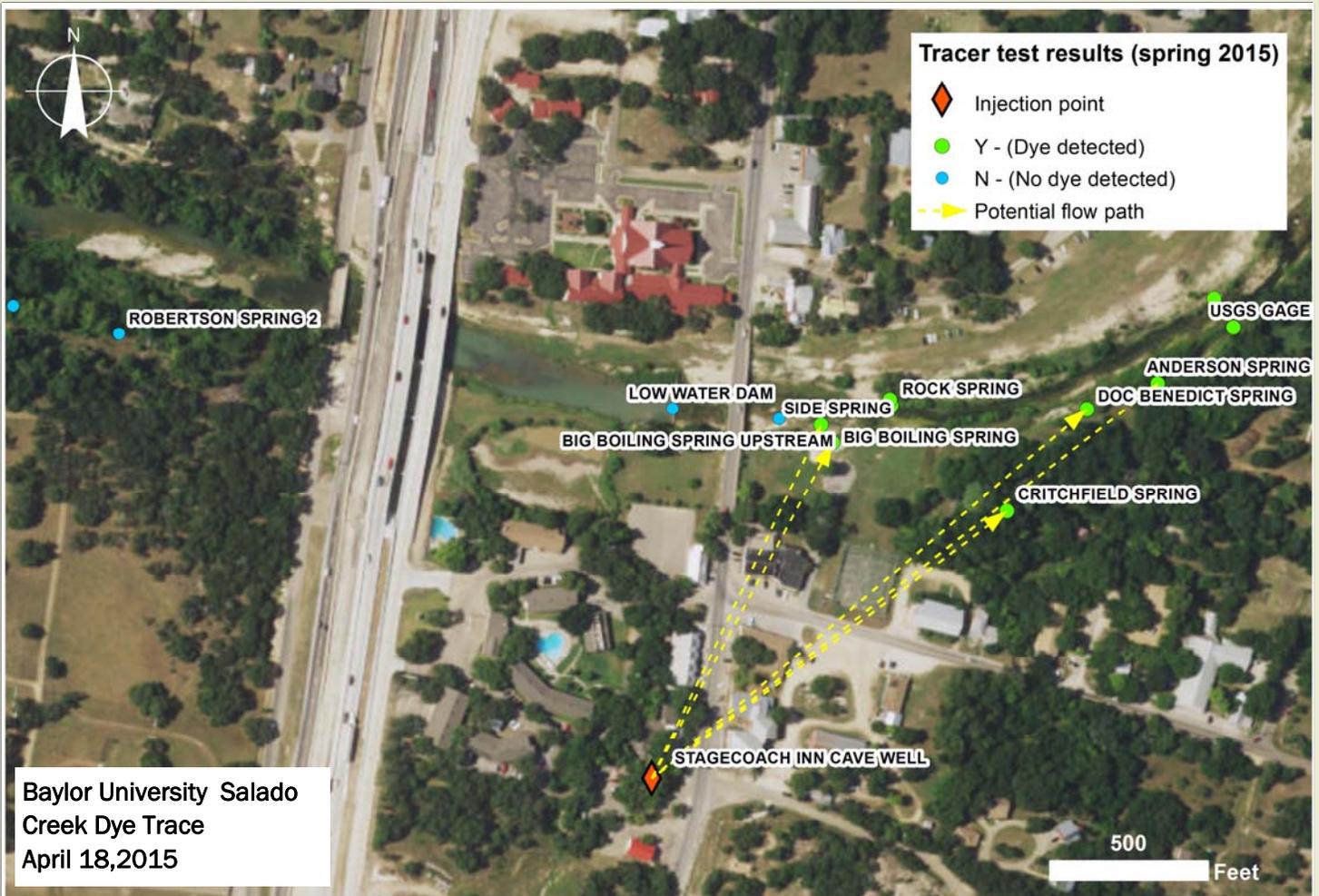
Historically, the Northern segment has been the least well-known part of the Edwards aquifer. Some can even make the case that it still is, compared to the body of research done on the Barton Springs and San Antonio segments. However, with monitoring and research efforts spear-headed by CUWCD and various collaborators, our understanding of the Northern Segment is increasing and improving.

I was first introduced to the Northern segment of the Edwards aquifer on a field trip in 2009 because some biologists were searching for Salado salamanders, tiny amphibians that lived solely in the shallow aquifer around Salado. Four years later, I was given the opportunity to study the Northern segment for my graduate research topic, and this area became my proverbial baby. Since then, the area has endured an Epic drought, gone through a federal listing process for the Salado salamander, and experienced recent spring storms that helped recharge the aquifer and drastically changed the Salado Creek that I have come to know over the last couple of years. This "baby" has certainly shown itself to be both endlessly fascinating and mind-boggling because of its ever-changing and complex nature. Some highlights of my work with CUWCD include: the installation of equipment to monitor recharge events and ground-

water responses to those events; conducting dye trace tests to confirm spring connectivity; and analyzing spring, stream, and well water for chemical constituents. We have been able to note that the aquifer level responds quickly while the chemistry of the water takes more time to change after a rain; confirm connectivity of all the springs in the Salado complex; and characterize properties of spring, stream, and well water in the Northern segment. Much of the data make sense to us, while other data leave us scratching our heads and excited about the prospect of discovering something new about the system. Another aspect that I greatly enjoy is conversing with our collaborators, landowners, and the interested public about what we do and why it's important.

With every field visit we make, every water sample we analyze, and every conversation we have, the Northern segment is becoming more "known". It is an exciting time to be working in the Northern segment of the Edwards aquifer. This research will be presented at the 2015 Bell County Groundwater Symposium.

*Stephanie S. Wong, Doctoral Student, Hydrogeology
Baylor University, Department of Geology*



HYDROLOGIC ASSESSMENT OF THE HENSELL FORMATION

The Hensell Formation, also referred to as the Middle Trinity aquifer is highly valued for its water quality, productivity, and accessibility. The Middle Trinity aquifer is a member of the major aquifer system, the Trinity Aquifer. The focus of my research is a hydrologic assessment of the Hensell Formation to evaluate the aquifer's characteristics: storage, transmissivity, and general water chemistry.



The primary focus of this research analyzes historic water level data to assess (DFCs). This study focuses on areas, where wells are in clusters causing cones of depression. This research is analyzing the zones experiencing the largest water level declines, and making predictions regarding DFCs. Aquifer test simulation software, hydrographs, driller's reports and well logs are being used to calculate the hydraulic conductivity, and storage coefficient. The purpose of calculating these values is to better understand hydraulic properties of the aquifer. The conclusion details recommendations for implementing future management strategies for the Middle Trinity aquifer.

A secondary objective of this study addresses the problem of co-mingling between the brackish Upper Trinity water and freshwater in the Middle Trinity aquifer. By mapping the water chemistry of the study area, this research identifies areas with high concentrations of total dissolved solids (TDS) in the groundwater. Some data have been collected on the groundwater chemistry, but the data are sparse. A synoptic groundwater chemistry map is being constructed to get a snapshot of the regional groundwater quality. This is accomplished by analyzing ionic concentrations, total dissolved solids, pH, and other parameters relating to water chemistry. Problem areas with abnormally high sulfate concentrations, and TDS values are being identified and studied to determine if brackish Upper Trinity water is migrating into the Middle Trinity aquifer below. Additionally, this study looks at the possibility of natural migration pathways between the Upper Trinity and Middle Trinity aquifers. This research will be presented at the 2015 Bell County Groundwater Symposium.

Jim Tucker – Baylor University M.S. student is researching the Middle Trinity aquifer in Bell and McLennan County.

Join the District for the 15th Annual
Bell County Water Symposium

November 19, 2015 8:00 A.M. – 4:00P.M.

This event is free but requires RSVP by November 13th.

Key Topics and Speakers

Groundwater Management Showcase (Joint Planning, Joint Efforts and Joint Respect)

Central Texas Groundwater Conservation District
Southern Trinity Groundwater Conservation District
Middle Trinity Groundwater Conservation District
Barton Springs/Edwards Aquifer Conservation District
High Plains Groundwater Conservation District
Clearwater Underground Water Conservation District

“Who are the GCD Across TX and What is their Story?”

Sarah Roundtree Schlessinger, Executive Director
Texas Alliance of Groundwater Conservation Districts

Groundwater Case Law, Court Decisions, Affirmation of Groundwater Management:

Mike Gershon, Attorney, Lloyd Gosselink Rochelle and Townsend

“Desired Future Conditions” - The Process, The Rules, The Conclusions, Why Science Matters?

Mike Keester, Senior Hydrogeologist, LBG-Guyton Associates

“Water Supply & Demand”— Trends and Challenges for the Southwest:

Dr. Robert Mace, Deputy Executive Director, Texas Water Development Board

Texas Well Owner Network:

Drew Gholson, TWON Coordinator, Texas A&M AgriLife Extension

Trinity Aquifer Geo-Chemistry Investigation:

Chris Braun, US Geological Survey

Middle Trinity Aquifer Investigation:

Jim Tucker, Baylor University

Edwards Aquifer Geo-Chemistry Investigation:

Chris Braun, US Geological Survey

Edwards Aquifer Investigation of Springs and Recharge Features:

Stephanie Wong, Baylor University

Salado Salamander Investigation:

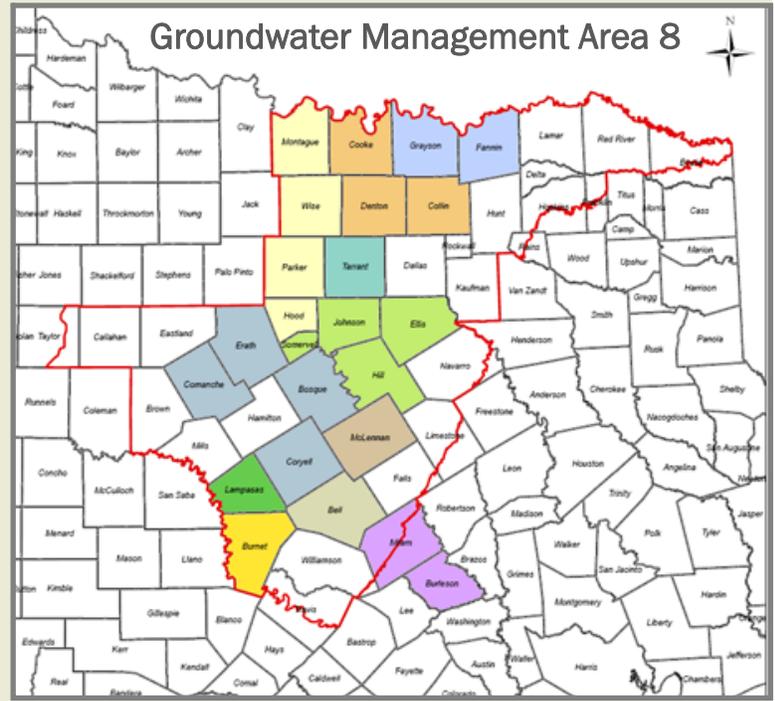
Pete Diaz, Texas Fish & Wildlife Conservation Office

| | |
|---------------------------------|---|
| Clearwater UWCD | Lloyd-Gosselink Attorneys at Law |
| LBG-Guyton Associates | Bell County Engineers Office |
| HALFF Associates | Texas AgriLife Extension Service |
| Texas Well Owner Network | Baylor University, Geology Dept. |

MANAGING OUR WATER

Groundwater Management Area 8 (GMA 8) is a management area created to assist Groundwater Conservation Districts in future planning for groundwater. Groundwater Management Areas were created "in order to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater, and of groundwater reservoirs or their subdivisions, and to control subsidence caused by withdrawal of water from those groundwater reservoirs or their subdivisions, consistent with the states objectives.

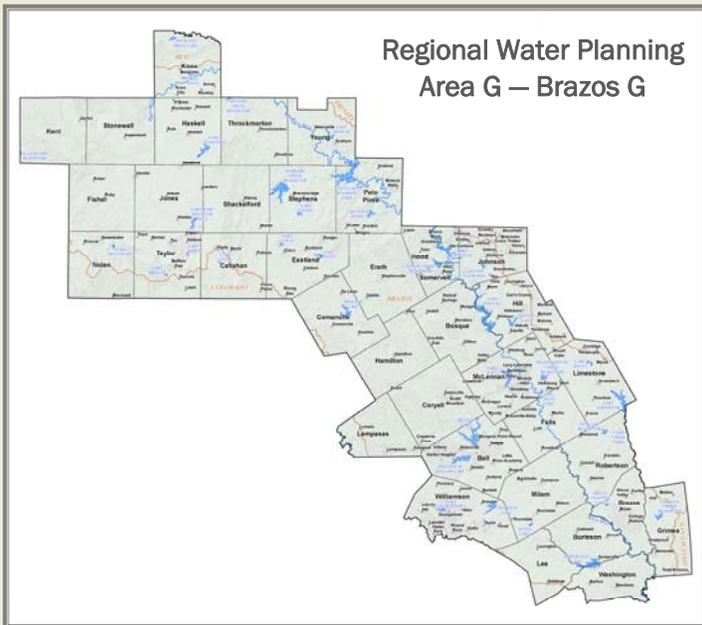
Region G Planning Group (commonly called Brazos G) stretches from the piney woods of Grimes County in the southeast to the rolling plains of Kent County in the northwest, the Brazos G Regional Water Planning Area includes all or parts of 37 counties. Over 90 percent of the region lies within the Brazos River Basin, with the Brazos River being the region's primary source of water. The largest economic sectors in the region are service, manufacturing, and retail trade. Major cities in the region include Abilene, Bryan, College Station, Killeen, Round Rock, Temple, and Waco.



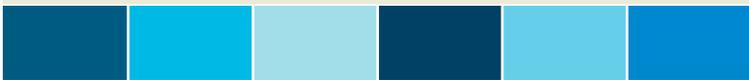
DESIRED FUTURE CONDITIONS

Desired Future Conditions are defined in Title 31, Part 10, §356.10 (6) of the Texas Administrative Code as "the desired, quantified condition of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one or more specified future times as defined by participating groundwater conservation districts within a groundwater management area as part of the joint planning process." The specified time extends through at least the period that includes the current planning period for the development of regional water plans pursuant to §16.053, Texas Water Code, or in perpetuity, as defined by participating groundwater conservation districts within a groundwater management area as part of the joint planning process. Desired future conditions have to be physically possible, individually and collectively, if different desired future conditions are stated for different geographic areas overlying an aquifer or subdivision of an aquifer.

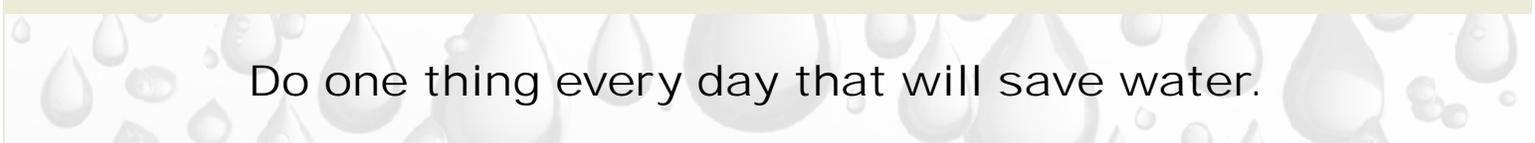
Why does this matter? Because all groundwater districts, including Clearwater UWCD, must conduct joint planning within each of the 14 management areas to set the DFC every five years. Who pays for the effort to set new DFC's during the five year interval? Those who fund Districts at the local level are the ones paying for it. So, when the legislature is in session and there is a bill proposing significant changes to the DFC process, we watch closely because bills filed often create undue burdens through unfunded mandates to the local tax payers.



Counties Represented in both Region G State Water Planning Group that are also in Groundwater Management Area 8 are Bell, Bosque, Comanche, Coryell, Erath, Falls, Hamilton, Hill, Hood, Johnson, Lampasas, Limestone, McLennan, Milam, and Williamson Counties.



Do one thing every day that will save water.



PRESIDENT'S MESSAGE (CONT.)

(Continued from page 1)

water quality screening on your well at no cost if it is registered with us. All you need to do is provide us a sample—we provide the bottle and instructions on obtaining an accurate sample.

You will be informed at our upcoming water symposium on the science done this year, so plan on attending this free conference that will be held on Thursday, November 19th. We will also be updating the public regarding the Salado Salamander and the new laws and rulings passed by the State and the Courts. Please call our office and make a reservation so we can have an accurate count for lunch. Until then, I'll see you at the water Symposium.

Leland Gersbach, President
Clearwater UWCD

MANAGEMENT CHALLENGES FOR SINGLE-COUNTY GROUNDWATER

Aquifer boundaries usually do not coincide with political boundaries. These conditions mean that single-county groundwater conservation districts (GCDs) like Clearwater Underground Water Conservation District (Clearwater) are hydrologically connected to groundwater in adjoining counties. Neighboring counties may have different management strategies for the same aquifer making it difficult to meet management goals such as Desired Future Conditions (DFCs). All GCDs are part of larger Groundwater Management Areas (GMAs) containing many counties and designed to coincide with major aquifer boundaries. GMAs are intended to provide management solutions for GCDs that manage aquifers across district boundaries. However, minor aquifer boundaries often cross GMA boundaries and the effectiveness of GMAs are often not always adequate.

Essentially there are three strategies single-county GWCDs can employ to preserve and protect their groundwater resources. One strategy is to be politically active. Political activity should include participation in the appropriate GMA and at the State level through the Texas Association of Groundwater Districts (TAGD). Another approach is proactive cooperation with adjacent GCDs. Although this may be possible through the GMA structure, sometimes it can be accomplished more effectively by working directly with an adjacent district with more similar interests. Finally, it is wise to develop monitoring systems and support research activities which can provide data helpful in negotiating decisions across political boundaries.

Clearwater shares the Lower and Middle Trinity aquifers with the Southern Trinity Groundwater Conservation District (Southern Trinity) to the north and shares the Edwards and Trinity aquifers with Williamson County to the south. Southern Trinity is a fellow member of GMA 8 but Williamson County does not have a GCD. Clearwater is politically active in GMA 8, TAGD, and the State legislature. Clearwater has been proactive in cooperative efforts with Southern Trinity exemplified by mutual support for Jim Tucker's research on the Middle Trinity aquifer in both Bell and McLennan counties. Clearwater has an active monitoring program and continues to support important research efforts through Baylor University, the USGS and the USFWS. Clearwater is a strong, single county groundwater conservation district that is currently poised to meet most challenges inherent to managing groundwater at the county level. However, Clearwater must continue its efforts if it is to meet future challenges.

Joe C. Yelderman Jr. Ph. D., P.G. #2941 – Hydrogeology
Professor, Baylor University, advisor to graduate students
Jim Tucker and Stephanie Wong.

WELL REGISTRATION REPORT

Well Registration Summary '02 through '15

| Period | Exempts Wells | | Non-Exempt Wells | | Total |
|--------------|---------------|------------|------------------|-----------|--------------|
| | Existing | New | Existing | New | |
| 2002-2014 | 4,060 | 803 | 108 | 48 | 5,070 |
| 2015 | 10 | 22 | 0 | 4 | 36 |
| Total | 4,070 | 825 | 108 | 52 | 5,106 |

Non-exempt wells are capable of producing a large volume of groundwater (over 17 gallons per minute), located on less than 10 acres, or are used for purposes other than Domestic, Livestock, or Poultry. All other wells are “exempt”.

PERMITTED WELL REPORT

2015 Well Production

| Aquifer | Exempts Wells | | Non-Exempt Wells | |
|---------------|----------------|------------|------------------|-----------|
| | Reserved Ac-Ft | Used Ac-Ft | Permits Ac-Ft | YTD Ac-Ft |
| Edwards (BFZ) | 825 | 385 | 2,502.92 | 1,725.01 |
| Trinity | 1,419 | 929 | 2766.09 | 409.46 |
| Other | 749 | 751 | 577.54 | 77.73 |

What is an acre-foot of water? The amount of water needed to cover an acre one foot deep in water. (325,851.43 gallons)

Mission Statement >>>

To implement an efficient, economical, and environmentally sound groundwater management program to protect and enhance the water resources of the District.

PUBLIC ADVISORY COMMITTEE

- Tom Madden—Precinct 1
- Henry Bunke—Precinct 2
- Marvin Green—Precinct 3
- Bradley Ware—Precinct 4
- Bill Schumann —At Large

WATER QUALITY

The District's in house lab offers registered well owners free screening for common constituents and bacteria. Sample bottles are available in our office. Annual screen-

join our
facebook
fan page

E-MAIL CONTACT LIST

Contact the District office if you would like to be included in our e-mail list for agendas and press releases.



Clearwater UWCD
P.O. Box 1989
700 Kennedy Court
Belton, TX 76513

Phone: 254-933-0120
Fax: 254-933-8396
www.cuwcd.com

(POSTAGE STAMP)

(NAME)
(STREET)
(CITY)

THE MANAGER'S COMMENTS

The Clearwater Underground Water Conservation District (CUWCD) was created in 1989 by the 71st Texas Legislature (HB 3172). Although the legislation authorizing the district passed in 1989, the district did not exist until it was confirmed by the voters of Bell County in an election held in August 1999. At that time, voters elected a board of five directors. Directors are elected by county precincts in staggered terms of 4 years. Funding for the district comes from ad valorem taxes at a current rate of \$.00395/\$100 valuation (\$3.95 per year on a home valued at \$100,000). The current board of directors just recently lowered the tax rate. The district has never increased the tax rate since 2002. The message to the citizens in Bell County is that the Board of Directors expect me, as "General Manager" to be *frugal, efficient, and correct* in administering state groundwater law as we protect the resource and property rights.

The District's jurisdiction includes all of Bell County - approximately 1,055 square miles. There are two major aquifers located within the district, the Edwards (BFZ) Aquifer and the three layers of the Trinity Aquifer (upper, middle and lower). Currently, the District is funding in depth scientific research to understand the hydrogeology that makes the water flow in both of the major aquifer systems in the district. This information will continue to allow the district to make decisions on water availability.

The District is governed by Chapter 36 of the Texas Water Code (TWC). Chapter 36 states that groundwater districts are the preferred method for groundwater management. Chapter 36 gives the District the authority to issue permits and set regulations for managing the underground water resources. From this authority, the District has adopted Rules and Regulations and a Management Plan. The groundwater management system we currently have in most of Texas is a concept created by the legislative body that lays the groundwork for the creation of groundwater conservation districts, a template for management, with limits to a district's authority and is known as "Chapter 36, Texas Water Code".

Chapter 36 of the Texas Water Code can be found on our district website along with our District Management Plan, District Rules, and District By-Laws (<http://www.cuwcd.org>). Clear-

water is a complete open book on our website. Each legislative session since 2001, discussions have occurred and modification to Chapter 36 often happens. The most recent session "84th Texas Legislature in the spring of 2015" was no different. Good common sense prevailed this session, even though we often have found very substantive changes with unfunded mandates.

Positive changes did occur in 2015 and are associated with the appeals process when setting new "desired future conditions (DFC's)" and the reestablishment of new "DFC's" every five years, with permit lengths, permitting process and renewals, as well as "aquifer storage and recovery". The "desired future condition" is a term defined in Texas groundwater law that means a quantitative description, adopted in accordance with Section 36.108, of the desired condition of the groundwater resources in a management area at one or more specified future times. This defines the "management focal point" of all groundwater districts. We have to permit to the DFC so that we can scientifically measure the health of the aquifer and sustain it for future generations. This challenge is not easy when a district must sustain the resource and allow production for beneficial use. It all revolves around science and common sense.

Our hope is that the citizens of Bell County appreciate the elected board of directors at Clearwater UWCD and their desire to protect the resource for future generations and still balance those decisions with property rights of all parties. Production is necessary to meet the current needs and uses by exempt domestic well owners as well as those large volume producers who are subject to the permitting rules and regulations of the district.



Dirk Aaron, General Manager
Clearwater UWCD

