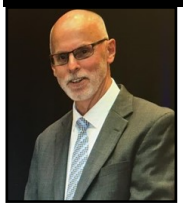
Clearwater Source

Clearwater Underground Water Conservation District

www.cuwcd.org

2021 Annual Newsletter | October 2021 | Volume 17, Issue 1

Population Growth is Upon Us in Bell County



Clearwater Underground Water Conservation District has set the Bell County Water Symposium for November 17, 2021, at the Bell County Expo Center – Assembly Hall. The theme of this year's event is *"CHANGES IN TEXAS MEAN CHANGES IN BELL COUNTY."*

Due to COVID, the 2020 symposium was canceled, but we have restarted our annual event by continuing our efforts with our partners: Texas AgriLife Extension Service in Bell County, the Bell County Engineers Office, and the Bell County Commissioners Court. We also have additional sponsors who have been very supportive.

Our first speaker of the morning will be Mr. Michael Irlbeck who is with EPCOR, an American Company with over 100 years of experience, working with municipalities and communities to develop and manage water and wastewater solutions. EPCOR is one of the largest water utility companies in the Southwest U.S. and is a recognized leader in Public-Private Partnership (P3's) space. Mr. Irlbeck is currently the Business Development Director for EPCOR USA Inc.

Following speakers will be Dr. Roel Lopez , Director with Texas A&M Natural Resource Institute and Dr. Robert Mace, Executive Director with Meadows Center for Water & the Environment at Texas State University. Their shared presentation is going to focus on the rural trends for land development and what that means for groundwater in Texas. Bell County is experiencing tremendous development of rural lands by fragmentation and subdivisions in an unparalleled fashion with developers depending on groundwater of which is unsustainable.

The Keynote of the Day will be delivered by our own County Judge, the Honorable David Blackburn who will discuss our need for understanding the growth that is here today and coming again tomorrow. Judge Blackburn is a key leader in Bell County who is helping all communities navigate the need to understand many issues related to our expanding population, our demand for new developments and the need to supply water in a sustainable fashion.

We will highlight our day with a special recognition of stakeholders and longtime leaders from across the county who have been significant in our forward progress since the drought of the 1950's and the most recent challenges of the past few years. The CUWCD Board of Directors look forward to another year of showcasing the importance of water to our robust economy.

Clearwater will present data per our most recent studies conducted and funded by the district to address many of the unknows concerning the depletion of artesian pressure in the Trinity Aquifer in the most southwestern portions of our County. This issue has been discussed in a collaborative effort with our Legislators and the County Judges and Commissioners of both Bell and Williamson Counties. Our concerns that the true pumping numbers of groundwater in Bell, Williamson and Northern Travis Counties are very relevant and this issue has seen the light of day because Clearwater has funded the necessary science ourselves to see what the regional pumping of groundwater is. Yes, the Counties to the south use more than **42,000-acre feet** of groundwater per year from the Edwards BFZ and Trinity aquifers collectively.

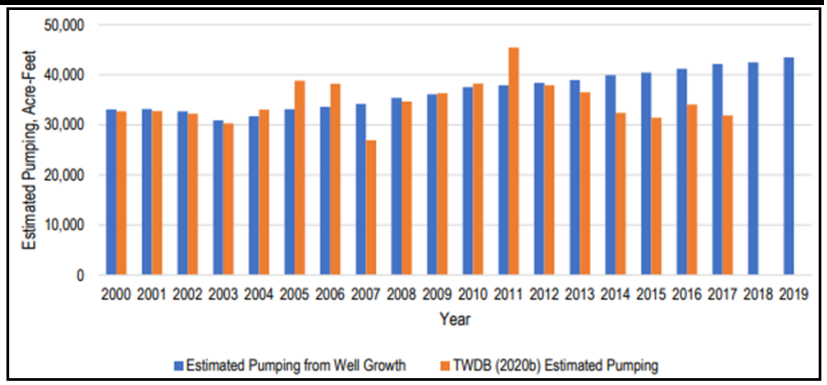


Figure 1. Travis and Williamson counties estimated groundwater pumping from the Edwards BFZ, Trinity and other aquifers.

The Drawdown Analysis of the Middle and Lower Trinity Aquifers in Bell, Travis and Williamson Counties validates that extreme declines continue at nearly ***10 feet per year*** and if the trend continues pumps will have to be lowered in wells with water levels reaching the top of the aquifer in less than 30 years in some of the higher developments in the areas to the west of I35. These declines are illustrated in monitoring wells shown on the map prepared in 2019 in figure 2 below. In northwestern Williamson County, the Middle Trinity Aquifer water levels are near the top of the aquifer. Landowners in this area have reported difficulties accessing groundwater from the Middle Trinity. It is likely that many well owners will soon, if they do not already, have pumps set near the bottom of their wells and will have to adjust to limited groundwater availability or find alternative water supplies. Conditions in the Lower Trinity are better than in the Middle Trinity, but is a much more expensive alternative that may not exist in some areas due to the unknown structure and challenges to drilling. A robust Risk Assessment is being conducted is be evaluated by the

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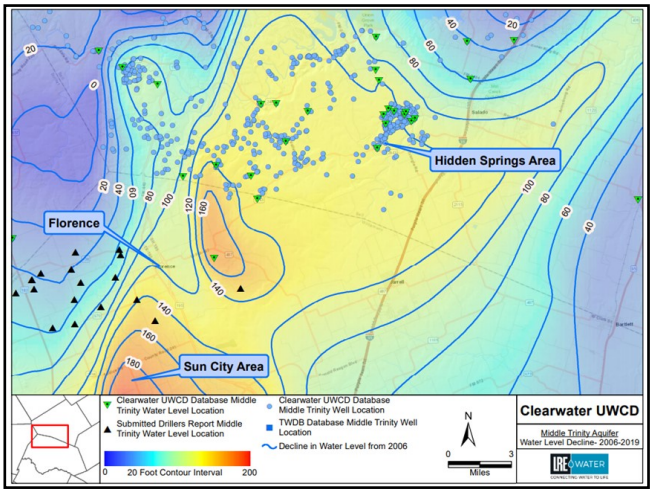

Figure 2. Middle Trinity Aquifer water level declines since 2006.

Board of Directors

Leland Gersbach - Precinct 1
2013-Present (President)

Jody Williams - Precinct 3
2018-Present (Director)

Gary Young - Precinct 2
2014-Present (Secretary)

Scott Brooks - Precinct 4
2018-Present (Director)

David Cole - At large
2013-Present (Vice-President)

Mission Statement

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

Water Quality Screening

The District's in-house lab offers registered well owners free screening for common constituents and bacteria. Annual screening is recommended.

Texas 4-H Water Ambassadors Make a Splash in Bell County and Beyond

With the continued financial and moral support of the Texas Water Industry and Texas A&M AgriLife Extension, the 4-H Water Ambassadors Program continues to push forward with the goal of developing the next generation of water leaders equipped with an appreciation for the complexities of water management.

This year marks the fifth year of the program where approximately 130 high school youth from across Texas have participated. Currently, there are sixty-two 4-H Water Ambassadors throughout the state, six of whom represent Bell County: Sarah Wood, Emma Canales, John Gauntt, Jane Gauntt, Jasmina Karim and Johangir Karim. Luke Read, a recent high school graduate from Bell County served three years in the program and is now pursuing a Civil Engineering degree at Texas A&M University. The 4-H Water Ambassadors Program combines advanced knowledge of water issues with leadership and citizenship development.

Whitney Ingram, Bell County Extension Agent, is very supportive of the program and engaged with the water ambassadors as she helps facilitate ambassador involvement in local events such as those provided by Clearwater. In the past year, state water ambassadors have reported more than 2,600 hours of education and service.

Sarah Wood is a high school senior now serving her third year as 4-H Water Ambassador. This summer, Sarah collaborated with Mary Rush Briggs Library in Morgan's Point Resort to plan a summer water program called "Is Water Wet?" for pre-K through fifth graders as part of their annual reading program. Sarah noted that "the program was a success due in large part to Clearwater Underground Water Conservation District staff and General Manager, Dirk Aaron, who supported the event with handouts and great tools such as the EnviroScape watershed model, rainfall simulator, and their fabulous water trailer".

On behalf of all the water ambassadors, it is my honor to thank Clearwater board members and staff for their continued support and encouragement of these future water leaders.

David Smith, Extension Program Specialist II,
Texas A&M AgriLife Extension, College Station

Water ambassadors with CUWCD General Manager, Dirk Aaron at the Morgan's Point water program.

Sarah Wood, water ambassador, teaching young scholars at the Morgan's Point water program.

Bell County Adaptive Management Coalition Continues

Natural Resources Solutions LLC (NRS) was contracted by the Bell County Adaptive Management Coalition (Coalition) in May 2020 for efforts pertaining to regulatory and supporting processes for the Salado salamander.

In response to U.S. Fish and Wildlife Service's (USFWS) proposed designation of critical habitat, NRS coordinated and developed public comments highlighting successful endeavors undertaken by the Coalition in Bell County that have aided in the protection of the species and its habitat. NRS was successful in its recommendation to remove three critical habitat units that were under an existing conservation easement on Solana Ranch. In the final critical habitat designation, USFWS removed 204 acres (Solana Ranch), which reduced the total critical habitat acreage in Bell County to 583 acres.

NRS also engaged with USFWS to provide technical information and data to inform the Species Status Assessment (SSA) currently being developed by USFWS. In collaboration with the Coalition, NRS conducted a literature review and developed a matrix of the species' ecology and life history (SSA Stage 1); assessed the current condition of the species, its habitat, and impacts (SSA Stage 2); and is currently projecting the species' response to future environmental conditions and conservation efforts (SSA Stage 3). Additional calls will be scheduled, and packages of information will be shared with USFWS.

Madelyn Todd, Project Manager/Policy Analyst,
Natural Resource Solutions LLC

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district and landowners before we can continue expending resources before drilling wells for rural development. The Water Symposium will have a panel of experts to discuss the science of understanding the limited sustainability of groundwater during these challenging times.

This year's annual newsletter has several repeat articles to realign our thoughts back to water and its limited amounts as we have all been somewhat distracted these past two years. But Water is the issue when it comes to our robust economy.

Just two years ago our Board President, Leland Gersbach stated that Clearwater is a leader in fostered local collaboration and he opened the 2019 Water Symposium by focusing on the biggest issue in our region and that is that "***Water will be what moves us forward or holds us back.***" Well, this issue is still upon us and local landowners who depend on groundwater should be mindful of the need to understand our limited resource here in Central Texas.

Dirk Aaron, General Manager
Clearwater UWCD

20th Annual Bell County Water Symposium

"Changes in Texas Mean Changes in Bell County"

November 17, 2021 8:00 A.M. --- 3:00P.M.

Bell County Expo Center - Assembly Hall

This event is free but requires RSVP by November 12th

Program at a Glance

8:00 a.m. - Registration

Status of Water in Texas

Mr. Michael Irlbeck, Business Development Director, EPCOR USA Inc.

Rural Land Trends and What They Mean for Groundwater

Dr. Roel Lopez, Director, Texas A&M Natural Resource Institute

Dr. Robert Mace, Executive Director, Meadows Center for Water & the Environment—Texas State University

Already but Not Yet Understanding Growth in Bell County

Honorable Judge David Blackburn

BRA Update on Surface Water Resources in Brazos Planning Region G

Mr. David Collinsworth, General Manager/CEO, Brazos River Authority

Mr. Brad Burnett, Lower/Central Basin Region Manager, Brazos River Authority

State of Groundwater in Bell County

Mr. Leland Gersbach, Board President, Clearwater UWCD

Mr. Dirk Aaron, General Manager, Clearwater UWCD

New Understand of the Middle Trinity in Bell and Williamson Counties

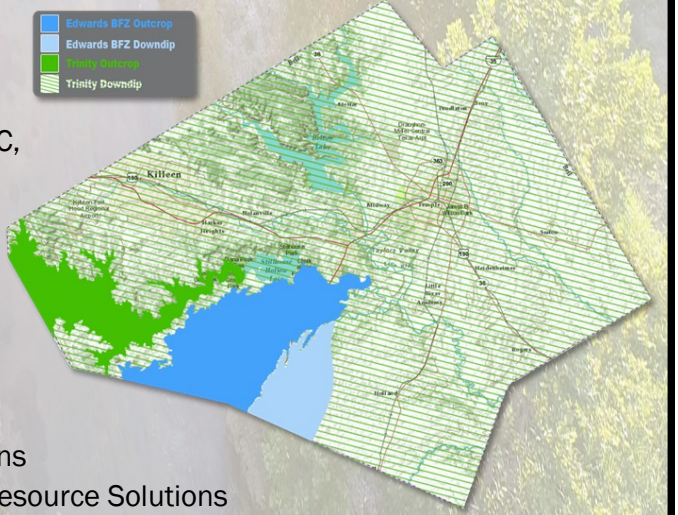
Expert Panel

Mr. Mike Keester, Professional Geoscientist, LRE Water

Dr. Joe Yelderman, Chair of Geosciences, Baylor University,

Mr. Vince Clause, Professional Hydrologist, Allan R. Standen LLC,

Mrs. Michelle Sutherland, Groundwater Resource Consulting



ASR, Is it a Viable Strategy in Bell County

Dr. Neil Deeds, Vice President, Professional Engineer, INTERA

Dr. Steve Young, Professional Engineer/Geoscientist, INTERA

Status of the Salado Salamander and Critical Habitat

Mr. Steve Manning, President & CEO, Natural Resource Solutions

Ms. Madelyn Todd, Project Manager & Policy Analyst, Natural Resource Solutions

Clearwater Underground Water Conservation District

Every drop counts!

The Clearwater Underground Water Conservation District

is Pleased to Announce the 20th Annual

Bell County Water Symposium

"Changes in Texas Mean Changes in Bell County"

November 17, 2021

8:00 a.m. - 3:00 p.m.

Location

Bell County Expo Center - Assembly Hall

301 W Loop 121, Belton, TX

This event is open to the public free of charge

Please RSVP by November 12th

254-933-0120

tsmith@cuwcd.org

Clearwater Underground Water Conservation District would like to extend a special thank you to the sponsors of the 20th Annual Bell County Water Symposium.

THE STATE OF TEXAS * BELL COUNTY *

TEXAS A&M AGRILIFE EXTENSION

Allan R. Standen LLC Groundwater & Natural Resource Consulting

KPA ENGINEERS

AGS Advanced Groundwater Solutions, LLC

LREWater, LLC a Leonard Rice Engineers Company

NRS Natural Resources Solutions LLC

MICHELLE A. SUTHERLAND Groundwater Resource Consulting

Lloyd Gosselink ATTORNEYS AT LAW

INTERA GEOSCIENCE & ENGINEERING SOLUTIONS

Scientific Advancement of the District's Groundwater Management

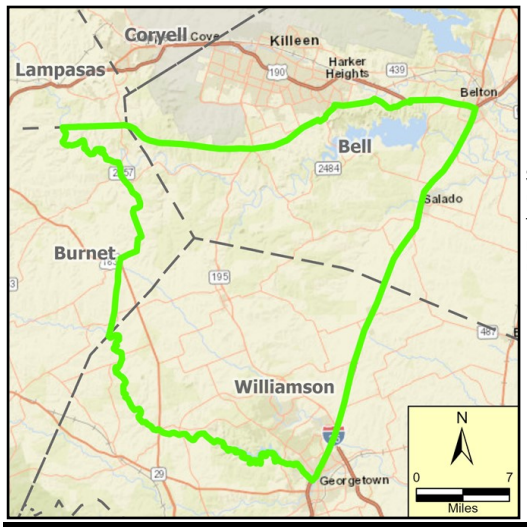
Over the past several years, the District has directed and participated in several studies of the groundwater conditions within and near Bell County. The District's technical consultants have been working to synthesize the information from these studies into a single reference with a focus on what the information means for management of the groundwater resources.

The results of research directed by Clearwater Underground Water Conservation District along with the reports of local well owners and drilling contractors has confirmed that the hydrogeologic conditions and groundwater availability of the Trinity Aquifer are distinctly different in the southwestern area of Bell County from other parts of the county. Over the last few years, the District has invested in more than a dozen projects to investigate the Trinity Aquifer structure, lithology, hydraulic properties, and water-level changes in the area. This year, the District is upholding its dedication to science-based aquifer management through a collaborative project between the District's consultants to develop a holistic understanding of the Trinity Aquifer in southwestern Bell, northeastern Burnet, and northwestern Williamson counties.

One goal of this project is to synthesize the research in which Clearwater UWCD has invested into a single report documenting the consensus understanding of the District's hydrogeologic experts. During this past year, the Clearwater UWCD consulting team developed answers to specific questions regarding the faulting and configuration of the aquifer units in southwestern Bell, northeastern Burnet, and northwestern Williamson counties to arrive at a shared understanding on how these affect groundwater flow through the aquifer.

One result of our work is the development of a science-based delineation of distinct hydrogeologic variations within and near Bell County. Moving forward, these results will help the District's Board of Directors define Management Areas within which groundwater resources can be effectively managed based on the area's specific aquifer conditions. The delineation of these areas may help property owners utilize their groundwater resources while also helping the District manage the resource so that remains available for future generations.

Mike Keester, Senior Project Manager/Hydrogeologist LRE Water



Study area to improve understanding of the faulting and configuration of the aquifer units.

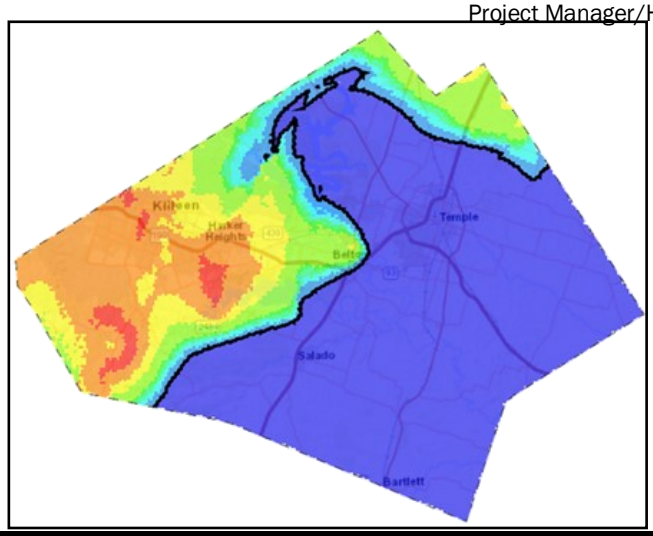


Illustration of the variation in hydrogeologic conditions in the Trinity Aquifer.

Analytical Tool for Evaluating Aquifer Status

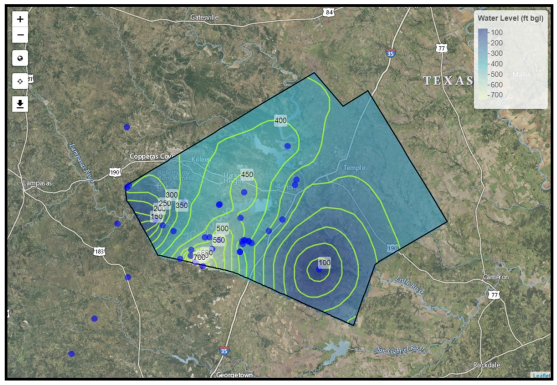
In 2014 the Clearwater UWCD began looking at their monitoring data in a new way to ultimate visualize data Clearwater wanted a scientific tool to better understand how the monitoring data they were collecting correlated to the desired future conditions for the aquifers and to improve communication of the status of the managed aquifers.

What began as a spreadsheet tool has evolved into an interactive web-browser based tool that provides a visual representation of measured water levels for the Upper, Middle, and Lower Trinity aquifers in Bell County.

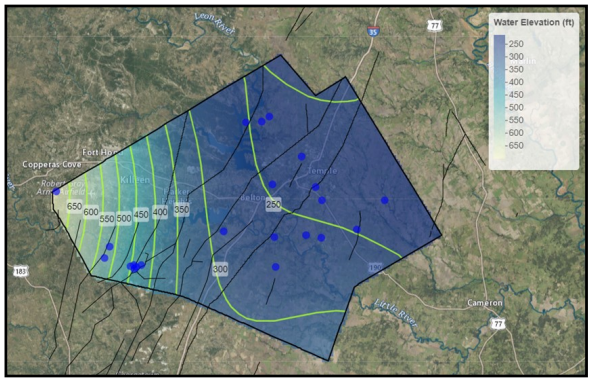
Currently, the tool analyzes water-level data collected at District monitoring well locations in these aquifers to assess and visually represent the current groundwater conditions relative to the desired future conditions.

During the 2021 Texas Alliance of Groundwater Districts Groundwater Summit, the Texas Water Development Board's mantra succinctly summarized the reason why we collect and analyze aquifer data: "The better the data, the better the science. The better the science, the better the policy". Without accurate groundwater data, we cannot begin to understand how our aquifers are doing. Without analysis of that data, we may fall into the trap of simply "shelving our data." Our decisions should be informed by the available science and backed up by our datasets. One of the main questions our analytical tools seek to answer is: Are we exceeding the Desired Future Conditions adopted by the District. To do so, the tool uses available water-level measurements to calculate an annual water-level decline rate for comparison to the adopted Desired Future Conditions. The approach provides a standardized, reproducible, and defensible means of assessing compliance with the District's Desired Future Conditions.

Micaela Pedrazas, Hydrogeologist LRE Water



Drawdown Maps of the Middle Trinity Aquifer .



Lower Trinity Aquifer 2021 Water Evaluation.

Clearwater Underground Water Conservation District
Every drop counts!
P.O. Box 1989
Belton, TX 76513

Knowing Where Your Aquifer Gets its Water Can Be Important

At the end of August, Chalk Ridge Falls Park near Belton was closed following an incident where a dog developed respiratory distress, possibly due to ingesting water containing cyanotoxins. Cyanotoxins are produced by blue-green algae that can grow to harmful levels in warm, stagnant, nutrient-rich water. Because this incident occurred at a park associated with Stillhouse Hollow Reservoir, one question that resulted from this incident was whether lake water could have influenced the presence of algal blooms at Chalk Ridge Falls Park. A first step in answering this question is determining if lake water is connected to water in the park.

Researchers at Baylor University in partnership with CUWCD recently completed a study to investigate groundwater-surface water interactions around Stillhouse Hollow Reservoir. Specifically, the team was interested in seeing if a suite of tracers (water chemistry, deuterium and oxygen-18 stable isotopes, and positive detection of zebra mussel eDNA) would indicate surface water (from the lake) in springs and wells near the reservoir. Results confirm the presence of surface water at sampled sites, indicating that the proportion of surface water varies and is highest during high-flow conditions when the lake level rises into the flood pool where it may be in direct contact with karsted limestone of the Edwards aquifer.

There is no evidence that blue-green algae can persist and be transported through the Edwards aquifer around Stillhouse Hollow Reservoir. However, this study documents the connection between groundwater and surface water in this area of Bell County and highlights the importance of further studies to protect natural resource quality.

Dr. Stephanie S. Wong, Baylor University
Dr. Joe C. Yelderman, Jr., P.G., Chair of Geosciences, Baylor University

Spring flow at Spillway Creek in Chalk Ridge Falls Park increases dramatically in high-flow conditions when the lake level rises into the flood pool.

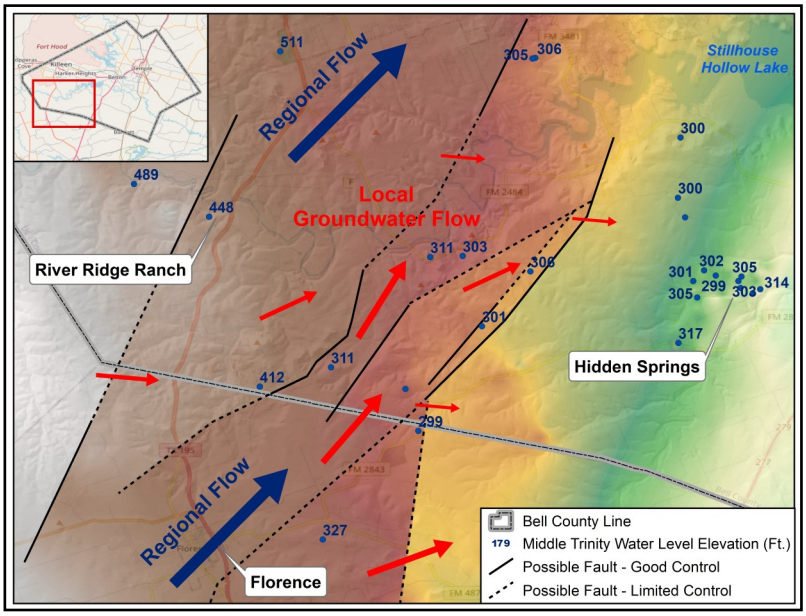
Developing a Conceptual Model for Groundwater Flow in Southwest Bell County

Over the last decade, landowners in Southwestern Bell County have observed local water level declines of over 100 feet in their wells. To address this public concern, Clearwater UWCD has invested in several studies aimed at understanding the Middle Trinity Hensell and Lower Trinity Hosston aquifer systems in this portion of the county. This has included the development and maintenance of the Clearwater 3D hydro-stratigraphic model.

Earlier this year Allan R. Standen, LLC completed a substantial update to the 3D hydro-stratigraphic model where an emphasis was placed on the subsurface geology in this area. Key findings from this update included identifying the Middle Trinity, Cow Creek Limestone as a possible aquifer below the Middle Trinity Hensell in western-southwestern Bell County and the identification of probable subsurface fault offsets impacting groundwater flow within the Middle Trinity Aquifer.

During September 2020, the Clearwater UWCD contracted Allan R Standen, LLC to expand on these findings. This new research will include a detailed review of all available water well driller reports and geophysical logs in an expanded study area to evaluate to what extent the underlying geology is a factor for these water level declines. This research will be completed in late 2020 and is part of a collaborative effort between Clearwater UWCD consultants and Baylor Geologic Studies to better understand the aquifer systems in Southwestern Bell County.

Vince Clause, Hydrogeologist
Allan R. Standen, LLC



Draft conceptual model framework for the Middle Trinity Aquifer in SW Bell County with possible fault/structural controls and grouwndwater flow paths.