

Prairielands eLine

The Newsletter of the Prairielands Groundwater Conservation District

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Understanding and Appreciating Groundwater: A Tribute to Texas Water Well Professionals

For many Texans, the journey groundwater takes from our aquifers hundreds or thousands of feet below us to our household faucets goes largely unnoticed. I'll admit—even with a background in geology, I didn't fully appreciate the process until I began working for a water well drilling company as a greenhorn completing my undergraduate studies.

Following drilling rigs and pump hoists around East Texas opened my eyes to the hard-working groundwater professionals who perform the hands-on work that keeps the water flowing to our homes, farms, and communities.

At Prairielands Groundwater Conservation District (PGCD), we recognize and celebrate careers within the groundwater industry. This quarter, our staff participated in four elementary school career days to introduce students to careers in the groundwater industry—including water well drillers, pump installers, geologists, and more.

Shining a Light on the Groundwater Industry

Water well drillers and pump installers play a crucial role in ensuring access to clean, reliable groundwater for public water systems, rural communities, and commercial/industrial facilities. Without

them, our farmers, ranchers, and industries could no longer supply us with most of our food supplies and modern conveniences.

These professionals are often required to sacrifice time away from their families on weekends, holidays, and in demanding conditions. Their workdays don't end at 5 p.m.—they end when the job is done.

According to the Texas Commission on Environmental Quality, "groundwater is the source for almost 20 percent of public water supplies and over 99 percent of drinking water for the rural population of over 1.32 million Texans." These professionals ensure that the infrastructure needed to extract and deliver groundwater is properly designed, constructed, and maintained.

It is More than Just Digging a Hole

Drilling a water well is an art form. To be a successful driller requires a plethora of knowledge spanning several skills and disciplines including, but not limited to, geology, engineering, heavy equipment operator, electrical, plumbing, welding, diesel equipment repair, meteorology, chemistry, physics, and business management.



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Most days involve braving the extreme Texas weather conditions or working in remote or hard-to-access areas, with long hours and complex technical challenges.

Successful wells start with good preparation and planning. A suitable site is selected, often with consultation with engineers, hydrogeologists, landowners, water operators, and/or drillers who assess site-specific conditions and concerns. Before any well is drilled, proper permitting and well registration requirements are fulfilled with applicable local and state regulators—including your local groundwater conservation district.

Workers “rig up” millions of dollars of specialized equipment consisting of drilling rigs, mud pumps, air compressors, water trucks, generators, mud tanks, and the proper tooling required to handle local conditions. In Texas, the most commonly used method for drilling water wells is direct rotary drilling, in which the drill bit and string rotate to bore through the ground while drilling fluids or air carry the cuttings up to the surface. These cuttings are analyzed to determine water-bearing potential and locate the best aquifer formation to target.

Alternative drilling methods, such as reverse circulation, cable tool, hand dug, direct push, auger, sonic, and coring, may also be used depending on the site-specific conditions and project requirements.



Constructing the Well

After reaching the target aquifer, well casing and screen are installed. This process will vary widely depending on the design of the well and often requires multiple passes with increasing bit sizes, or pressure cementing casing

and drilling out a float shoe in a “two-piece”, telescoping well design. The well screen is slotted pipe placed on the bottom portion of a well to allow groundwater to flow into the well while filtering out sediment. Casing is pipe (usually steel or PVC) that is installed above the screen to prevent borehole collapse and protect against surface contamination.

The space between the screen and the borehole—called the annular space—is filled with gravel pack material while the annular space around the casing is sealed with cement and bentonite to prevent borehole collapse and safeguard against pollutants.

The well is then developed by mechanical and chemical processes that remove drilling debris to create the highest level of continuity between the well and aquifer. A submersible pump is selected and installed to complete well development and bring groundwater to the surface. Finally, the well is connected to the water distribution system.

Even after the well is operational, it requires ongoing maintenance and equipment replacement throughout its lifespan to keep the water flowing.

Appreciating Their Work

Appreciating water well professionals means recognizing the essential service they provide. It’s about acknowledging their critical role in protecting public health, supporting local economies, and ensuring access to one of our most essential natural resources—groundwater.

Many of these professionals operate small, family-owned businesses passed down through generations—embodying a deep legacy of dedication and service.

At PGCD, we encourage our communities to support local water well drilling companies — whether by hiring locally, promoting water conservation, or simply offering a cold drink and a sincere thank you to those working in the triple-digit heat of a Texas summer.

To learn more, visit the PGCD website for a link to the state database of licensed water well drillers and pump installers. Together, we can honor the individuals who help keep Texas water flowing.

*By Dillon Bybee, P.G.
PGCD Staff Geologist*

Understanding Regional Water Planning in Texas: Prairielands GCD's Role in Regions G and C

Water planning in Texas is a collaborative, multi-layered process designed to ensure that our state can meet future water demands through responsible and sustainable strategies. Central to this process is the development of Regional Water Plans, which are compiled by 16 designated Regional Water Planning Groups (RWPGs) across the state. These regional plans are updated every five years and ultimately feed into the State Water Plan, which serves as the foundation for water infrastructure funding and policy decisions at the state level.

Each RWPG includes representatives from across the water sector, including municipalities, industry, agriculture, environmental groups, and groundwater conservation districts. Their goal is to evaluate long-term water needs and identify feasible strategies to address potential shortages.

Prairielands Groundwater Conservation District (GCD) serves a unique position in regional planning, as its jurisdiction spans two regional planning areas:

- Most of the District, Hill, Johnson, and Somervell counties, falls within Region G,
- Ellis County, one of the District's four counties, lies within Region C, which includes much of the fast-growing Dallas-Fort Worth Metroplex.

Because of this overlap, Prairielands GCD actively participates in both Region G and Region C planning efforts to ensure the District's priorities and data are represented in both plans.

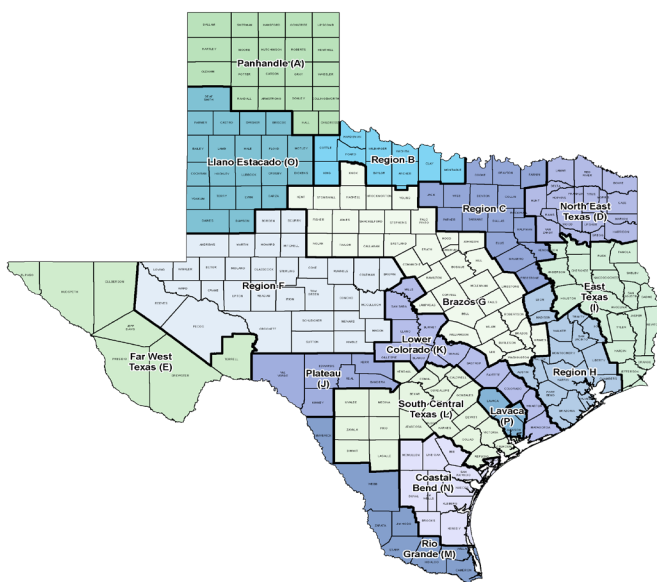
How Groundwater Management Areas (GMAs) Fit In

In parallel to the regional planning process, Groundwater Management Areas (GMAs) play a vital role in shaping how groundwater is managed locally and across planning regions. Texas is divided into 16 GMAs. Prairielands GCD, along with 10 other GCDs,

are members of GMA 8.

Through the GMA joint planning process, groundwater conservation districts within a GMA collaboratively establish Desired Future Conditions (DFCs)—long-term goals that define how much water can be pumped from aquifers without causing unacceptable impacts. These DFCs are then used by the Texas Water Development Board (TWDB) to calculate the Modeled Available Groundwater (MAG) for each aquifer.

Once established, the MAG values are provided to the Regional Water Planning Groups and incorporated into the water supply availability portion of each region's plan. In this way, the work of groundwater districts—like Prairielands GCD—in setting science-based DFCs directly shapes the strategies and assumptions used in Texas' official Regional and State Water Plans.



Moving Forward

By actively participating in both GMA 8 joint planning and Regions G and C water planning efforts, Prairielands GCD plays a vital role in shaping the future of groundwater use and availability in the

region. The District continues to advocate for responsible groundwater management, realistic planning assumptions, and the development of additional water supply strategies—including conservation, reuse, and surface water development.

These efforts ensure that our local aquifers are protected and managed to serve current needs and future generations across Ellis, Hill, Johnson, and Somervell Counties.

For more information about regional planning efforts or to review current draft plans, visit www.brazosgwat.org for Region G or www.regioncwater.org for Region C.

Staff Spotlight

Prairielands Groundwater Conservation District is pleased to announce the addition of Dillon Bybee as the District's new Staff Geologist.

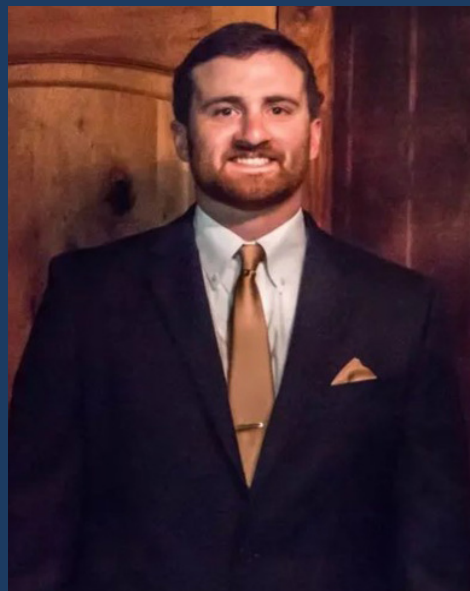
Dillon brings with him a strong background in hydrogeology and water well construction. He is a licensed Professional Geoscientist and Water Well Driller/Pump Installer in Texas, with a diverse range of field and consulting experience. He earned his B.S. in Geology with a minor in Business Administration from Stephen F. Austin State University, where he also completed graduate studies in Geology and GIS.

In his role, Dillon will support the District's efforts in groundwater monitoring, groundwater availability certification and technical permitting reviews, aquifer analysis, and long-range water planning. His practical field experience and technical expertise will be a valuable asset as the District continues its mission to protect and manage groundwater across Ellis, Hill, Johnson, and Somervell Counties.

Over the past several years, Dillon has worked in various capacities—from hands-on drilling operations to technical consulting—at Russell Drilling Company, Eocene Consulting, and Hydrex Environmental. His expertise includes water well design and construction, aquifer analysis, geophysical logging, regulatory compliance, and client project management. Dillon is also skilled in GIS mapping, remote sensing, and the use of specialized groundwater modeling software.

Dillon, originally from North Texas, recently relocated to this area with his family from Nacogdoches. He and his wife Heather have two young children—Marshall and Hadley. We are excited to welcome Dillon and his family to the community and the Prairielands GCD team.

Please join us in welcoming Dillon to the District!



Why Groundwater Level Data Matters in the Prairielands GCD

By Micheal Heath

PGCD Field Operations Coordinator

Groundwater is a major water source for homes, farms, businesses, and communities across the Prairielands Groundwater Conservation District ("District"), which includes Ellis, Hill, Johnson, and Somervell counties. As populations grow and water demands increase, protecting this resource becomes more important than ever.

PGCD regularly monitors groundwater levels through a network of observation wells. This data helps track the condition of key aquifers—like the Trinity and Woodbine—so the District can identify trends, assess drought impacts, and ensure long-term water availability. These measurements are essential for making science-based decisions about well permitting, conservation measures, and drought response. Over the next 30 years, District staff will be actively working to expand the monitoring network to ensure coverage across the entire District.

Groundwater level data also supports broader water planning efforts across Texas. It contributes to the development of regional water plans and helps ensure that PGCD's management strategies align with the Desired Future Conditions established by Groundwater Management Area 8.

For local landowners, utilities, and water providers, water level information is also a practical tool, it helps them manage wells efficiently, anticipate pumping needs, and plan for future supply. By maintaining a robust monitoring program, PGCD promotes transparency, supports informed decision-making, and works to support responsible groundwater management for the benefit of current and future generations. Figures 1–4, on the following page, show water level measurements collected through the District's monitoring program.

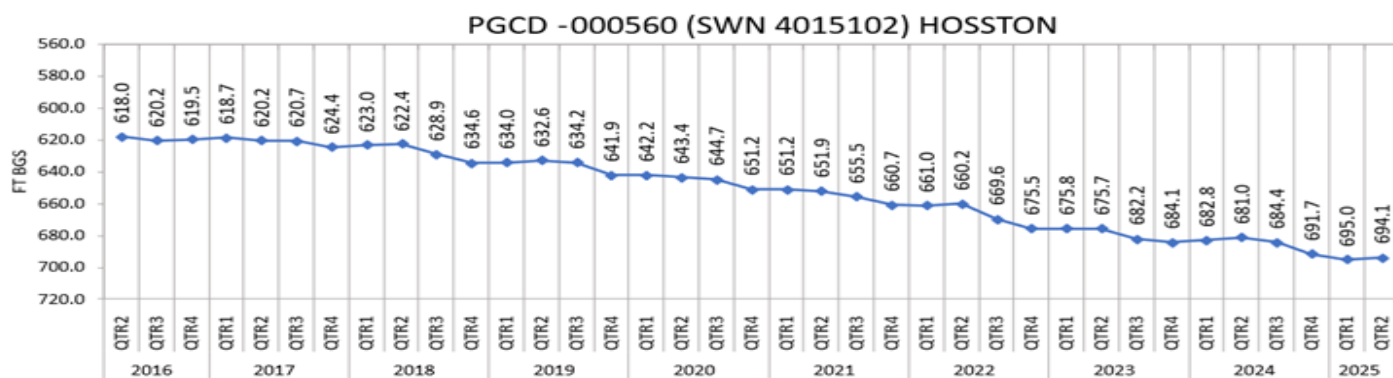


Figure 1: Hosston Formation water levels in Aquilla, TX in Hill County

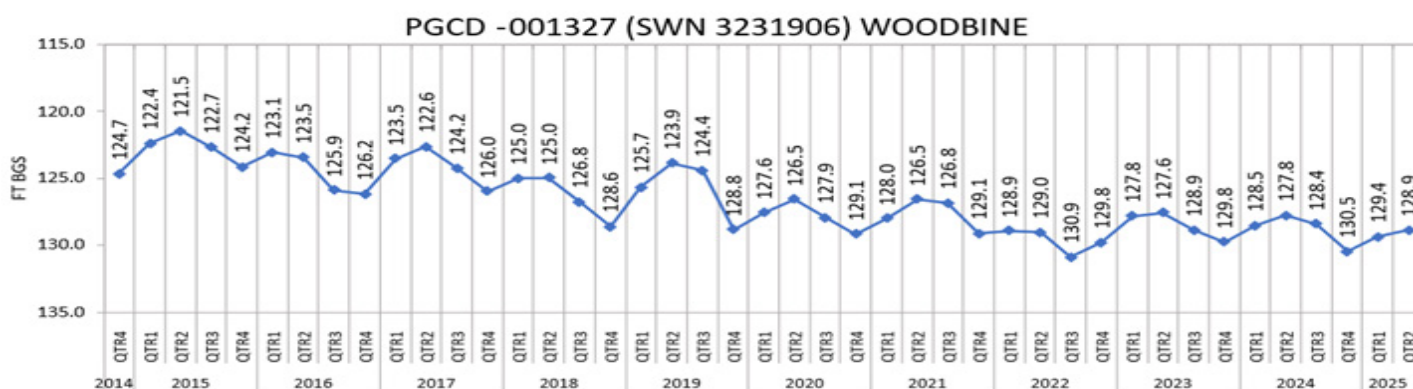


Figure 2: Woodbine Formation water levels in Mansfield, TX in Johnson County

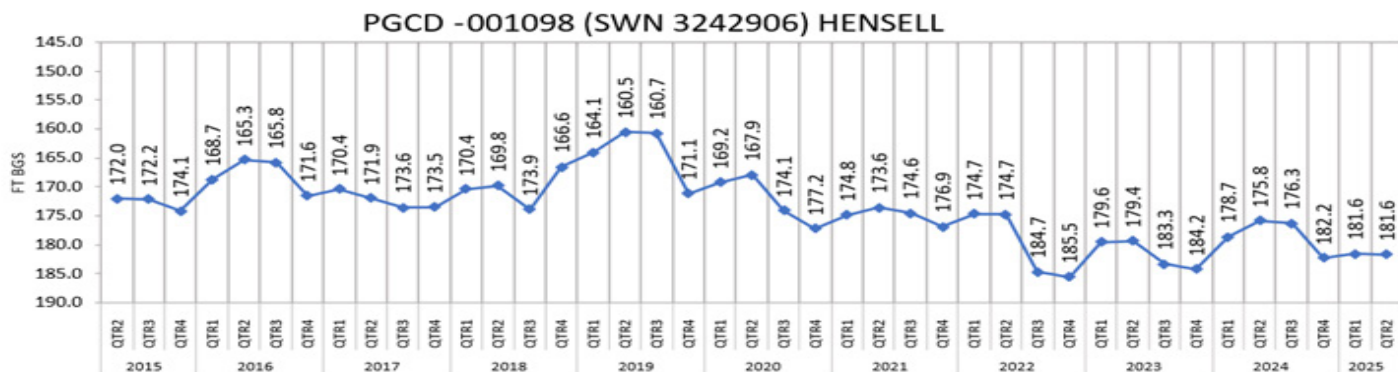


Figure 3: Hensell Formation water levels in Glen Rose, TX in Somervell County

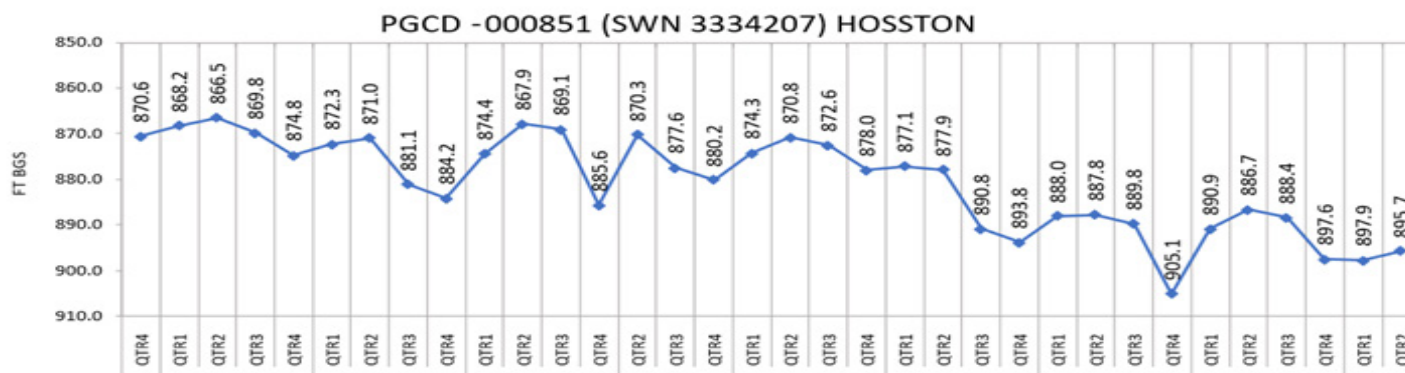


Figure 4: Hosston Formation water levels in Red Oak, TX in Ellis County

About Prairielands GCD

The Prairielands Groundwater Conservation District was created in response to a finding by the Texas Commission on Environmental Quality that groundwater shortages were expected in Ellis, Hill, Johnson, and Somervell counties over the next 25 years. The TCEQ finding required local residents to create a groundwater conservation district, or else TCEQ would mandate one. Enabling legislation for the Prairielands GCD was passed in 2009.

The Mission of the Prairielands Groundwater Conservation District is to develop rules to provide protection to existing wells, prevent waste, promote conservation, provide a framework that will allow availability and accessibility of groundwater for future generations, protect the quality of the groundwater in the recharge zone of the aquifer, insure that the residents of Ellis, Hill, Johnson, and Somervell Counties maintain local control over their groundwater, and operate the District in a fair and equitable manner for all residents of the District.

Upcoming Events and Meetings

May

- 31 Rainwater Harvesting Workshop**
208 Kimberly Dr.
Cleburne, TX

June

- 10 WET Event**
Staples Elementary
Summer Camp
- 10-11 TAGD Summer Business Meeting**
Pflugerville, TX
- 11-13 TWA Summer Conference**
The Woodlands, TX

- 16 PGCD Board Meeting**
9:00 a.m.
208 Kimberly Dr
Cleburne, TX

- 24 GMA 8 Meeting**
9:00 a.m.
208 Kimberly Dr
Cleburne, TX

July

- 4 Independence Day**
PGCD Office Closed
- 21 PGCD Board Meeting**
9:00 a.m.
208 Kimberly Dr
Cleburne, TX

General Manager
Kathy Turner Jones

Board:

President
Charles Beseda
Hill County

Vice President
Paul Tischler
Johnson County

Secretary/Treasurer
Maurice Osborn
Ellis County

Director
Marty McPherson
Somervell County

Director
Kathy Tucker
Ellis County

Director
John Curtis
Somervell County

Director
Brad Daniels
Hill County

Director
Barney McClure
Johnson County

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