2023 Annual Report

Hays Trinity Groundwater Conservation District

2023 Board of Directors

Linda Kaye Rogers – President

Bruce Moulton – Vice President

David Smith – Secretary/Treasurer

Doc Jones

Carlos Torres-Verdin

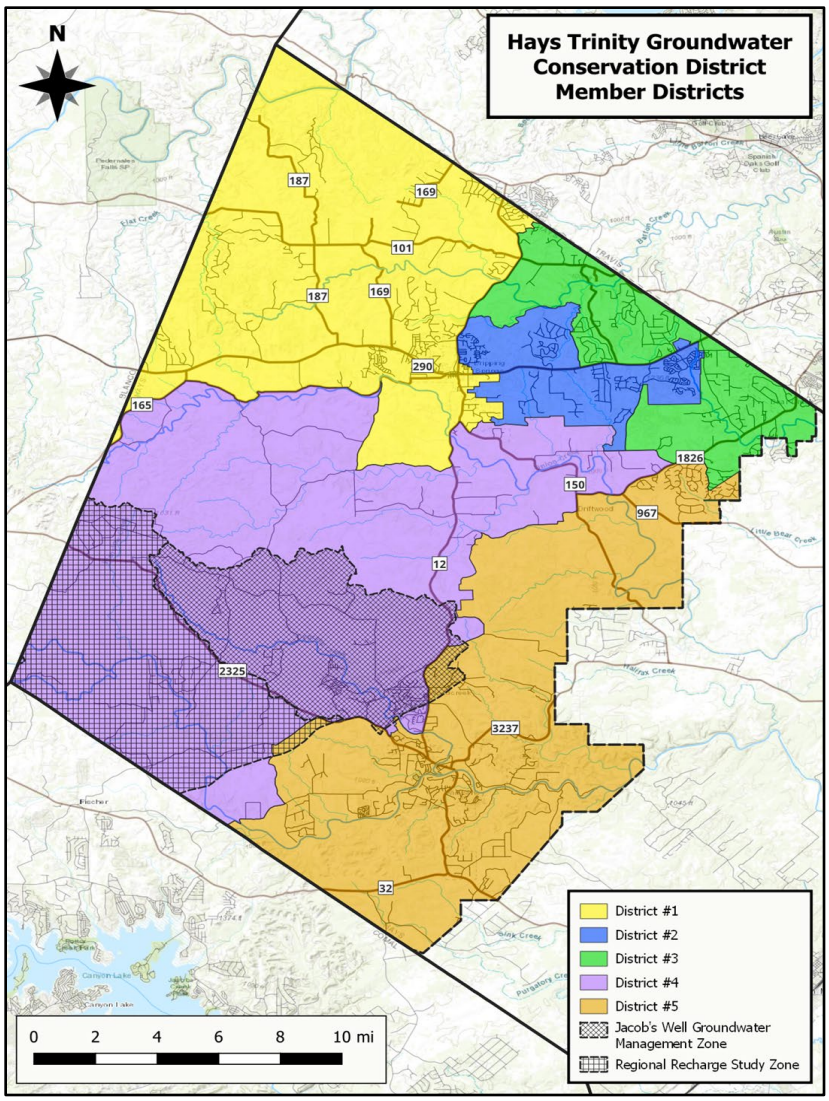
2023 Staff Members

Charlie Flatten – General Manager

Radu Boghici PG -- Hydrogeologist

Keaton Hoelscher – Geo-Technician

Laura Thomas – Assistant General Manager



Researched and compiled in 2024 by:

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Laura Thomas, Assistant General Manager
Radu Boghici, P.G., Hydrogeologist
Keaton Hoelscher, Geoscience Technician

2023 Board of Directors:

Linda Kaye Rogers, President; Bruce Moulton, Vice President; David Smith, Secretary/Treasurer; Doc Jones; Carlos Torres-Verdin.

2023 ANNUAL REPORT

HAYS TRINITY GROUNDWATER CONSERVATION DISTRICT
MANAGEMENT GOALS, OBJECTIVES, & PERFORMANCE STANDARDS

Executive Summary

The 2023 Annual Report is an account of the Hays Trinity Groundwater Conservation District's (District or HTGCD) management and protection of the Trinity Aquifer through the development of science, data gathering, regional groundwater planning, permitting, education, and outreach.

In 2023, the District initiated and participated in numerous activities including the development and refinement of local hydrogeologic science, education & outreach, policy directives, capital projects, and drought management in order to fulfill its objectives.

The financial health of the District in the short term is secure. However, due to revenue structures, a reduction in economic growth would negatively impact the District's revenues and its ability to effectively protect the groundwater resource. A move away from growth-based revenue is recommended. The District passed its mandated annual 2022 audit (See Financial Appendix).

A stubborn and severe drought dominated the District's management throughout 2023. The District declared Alarm Drought Stage in February of 2022. By September of 2022, conditions had deteriorated such that western Hays County remained in the highest (Emergency Drought) stage for the entirety of 2023. Following amendments in 2022 relating to drought stages and triggers, the Board amended District rules to further improve conservation and management of the aquifer during drought. The District also undertook a significant set of amendments to the rules largely for the purpose of conforming to new statewide legislative mandates and conformation to Chapter 36, Texas Water Code. See Section 6 for further detail.

The HTGCD Board of Directors held 15 Board meetings and 6 Public Hearings in 2023 (Appendix, Section 1).

2023 Numbers At A Glance:

- 99 new wells
    - 97 exempt (domestic and agriculture)
    - two non-exempt
- 102 total active permits
    - 4 new permits issued (8.81 acre-feet/year)
    - 1 permit retired (1.3 acre-feet/year)
- 7.51 acre-feet/year increase in permitted volume in 2023;

- 3,805 total permitted acre-feet/year
- 696 new public water supply connections

The District registered 99 new wells in 2023; 97 are exempt from regulation and two are non-exempt. The District added one observation/monitor well to its network. The District issued 4 new permits for non-exempt withdrawals and retired 1 permit bringing the total to 102 active permits. The net change in permitted volume is 7.51 acre-feet/year for a total of 3,805 acre-feet/year. There were 696 new public water supply connections reported to the District (Appendix, Section 2). Permitted plus estimated Exempt volumes committed totaled 7,757 acre-feet/year leaving 1,341acre-feet/year available from the Texas Water Development Board's (TWDB) Modeled Available Groundwater (MAG) allotment[1] of 9,098 acre-feet/year for the District. It should be noted that the 1,341 acre-feet/year volume remainder must be shared by future exempt (domestic and agriculture[2]) and non-exempt (commercial and other) users.

Rules, Bylaws, Enabling Legislation, and other regulatory structures of the District can be found on the District website's Regulatory page.

In addition to the following prescribed Objectives and Performance Standards, the District maintains a robust Education and Outreach Program. 2023 highlights include the continuation of the Water Wise Speaker Series, and various public facing education and outreach opportunities. See Appendix Section 5 for details.

Introduction

The Hays Trinity Groundwater Conservation District was created by the 77th Texas State Legislature (S.B. 2, 2001) in order to compile and develop sound hydrologic data and to manage and protect the aquifers that supply safe water in western Hays County as illustrated by the Map on page 2. The District is governed by a locally elected Board of Directors and is managed by District Staff as listed on the title page.

As required by District Bylaws (4.2, a) an annual report shall be prepared for and provided to the Board of Directors by District Staff on the status of the District and its programs. The *2021 Groundwater Management Plan* serves as a guide for the District's annual reports. The *2022 Annual Report* describes a methodology for tracking progress in achieving management goals. The headings in the report are prescribed by the Texas Water Development Board TWDB: TAC 356.52 (a)(2), (a)(3), TAC 356.52(a)(1), and in TWC 36.071. The District shall use this Report to document other business, such as Financial Reports.

[1] TWDB MAG model run GR21-014 stipulates a decreasing MAG over time.
[2] By Enabling Legislation design (and unlike most GCDs in the State), Agriculture is exempt from permitting in the HTGCD.

Management Objectives and Performance Standards

1. Goal: Providing the Most Efficient Use of Groundwater

1.1. *Management Objectives*

Each year, the District will hold at least one educational event.

Performance Standard

Each year, a summary of the District educational events schedule will be included in the Annual Report

HTGCD attended, participated, hosted, or presented in the following educational, outreach, and planning events:

January 2023

- 11 Participated: Region K
- 11 Participated: DSUC
- 12 Hosted: HTGCD Board Meeting
- 16 Attended: DSWSC
- 19 Participated: AQUA/WVWA
- 19 Participated: INTERA
- 22 Attended TCEQ Public Meeting on Blizexas, LLC's Proposed New TPDES Permit No. WQ0016111001
- 24 Attended: TWDB Water for Texas
- 30 Hosted: Coms Smith + Shell

February

- 2 Hosted: HTGCD Board Meeting (postponed)
- 6 Participated: INTERA
- 6 Hosted: DSWSC
- 6 Hosted: Fults Lawsuit
- 7 Participated: AQUA wells meeting
- 7 Participated: AQUA wells site visit
- 8 Participated: SwTCGCD Board Meeting
- 8 Participated: DSUC
- 9 Presented: CCWPP
- 15 Hosted: HTGCD Board Meeting
- 16 Participated: La Ventana Site Visit
- 17 Hosted: Holly Fults + 1
- 20 Attended: DSWSC (DS+BM)
- 21 Participated: GMA-9
- 21 Participated: THCCN
- 22 Attended: Cen Tex Water Conservation Summit
- 23 Hosted: Rule 16 Planning

March

- 2 Hosted: HTGCD Board Meeting

- 3 Participated: Tri-District Managers' Meeting
- 7 Participated: GMA-9 Ellenburger Model Planning
- 8 Hosted: Wimberley Hill RV Technical – DR/EO/Staff
- 8 Attended: DSUC
- 9 Attended: TAGD Business Mtg.
- 15 Attended: Mirasol Site Visit
- 20 Attended: GMA-9 NGO Working Group
- 22 Participated: Sentinel Peak Preserve CCWPP Riparian Wkshop
- 27 Hosted: Eric Osterhaus – Wimberley Hill RV - Policy
- 28 Attended: House Natural Resource Committee Mtg.
- 29 Attended: TLAP SOAH Hearing
- 30 Hosted: Special Board Meeting – INTERA
- 31 Jacob's Well Spring: a Hydrogeological Review; Presentation before the Texas Groundwater Association Annual Meeting, San Marcos, March 30, 2023 (Boghici)

April

- 6 Hosted: HTGCD Board Meeting
- 11 Participated: Testify at HNRC on CSHB-5025
- 17 Attended: DSWSC Board Meeting
- 18 Hosted: HTGCD Special Board Meeting (2 Variances)
- 19 Presented: CCP GW Workshop
- 21 Hosted: Rebecca Cade (San Marcos Reporter)
- 25 Participated: GMA-9 Boerne
- 26 Participated: Region K Montopolis
- 28 Presented: La Ventana Resident Mtg
- 28 Hosted: Aqua Texas Pump Test Plan Mtg.
- 29-30 Participated: Dripping Founders Day

May

- 4 Participated: Region L
- 4 Participated: THCCN H2O
- 4 Hosted: HTGCD Board Meeting
- 5 Hosted: O&E Meeting
- 8 Participated: WWSC mtg
- 9 Hosted: D. Trejo
- 10 Participated: GMA-10
- 10 Attended: DSUC
- 11 Presented: UT Field class
- 15 Attended: DSWSC
- 17 Hosted: Mikah Shaw
- 17 Participated: M. Bruno: GCD Planning Tools
- 18-19 Presented: Hill Country Leadership Institute
- 22 Participated: Silver Creek pump test
- 25 Participated: Mirasol visit
- 31 Participated: HTGCD Rules committee

June

- 1 Hosted: HTGCD Board Meeting
- 6 Participated: TAGD Technical Well Sampling Class
- 6 Participated: TAGD Business Meeting
- 14 Attended: DSUC Meeting
- 19 Attended: DSWSC Board Meeting
- 28 Participated: Aqua Texas Aquifer Test data dump
- 29 Hosted: Silver Creek
- 29 Hosted: INTERA Mirasol
- 30 Hosted: Mirasol Greg Ellis
- 30 Hosted: Mirasol Jim Truitt

July

- 5 Hosted: Mikah Shaw interview
- 6 Hosted: HTGCD Board Meeting
- 10 Participated: Aqua reporting conf call
- 12 Participated: Region K
- 12 Participated: Ozona Bank dye trace
- 13 Participated: GAM Stakeholder Group
- 14 Presented: Wimberley WPP
- 17 Participated: GMA-10
- 17 Attended: DSWSC Board mtg
- 18 Participated: SWTCGCD Board mtg
- 19 Hosted: Jim Blair Bee Cave Drilling
- 21 Participated: Emma Margulies (HCA)
- 24 Participated: TAGD Panel mtg
- 25 Participated: GMA-9
- 26 Hosted: Jim Truitt Mirasol
- 27 Participated: Mgrs Mtg
- 27 Participated: City of Blanco Water mtg
- 31 Participated: Wizard Academy site visit

August

- 3 Participated: Region L
- 3 Participated: HC Trinity Aquifer Model Stakeholder Advisory Committee
- 3 Hosted: HTGCD Board Meeting
- 4 Participated: HCCN Water Team
- 8 Participated: Climate news interview
- 8 Participated: KUT news interview
- 9 Participated: Mayor Rasco Woodreek
- 9 Attended: DSUC
- 10 Participated: Bill Ward CMU
- 10 Hosted: DSUC Nominating Committee
- 11 Participated: Tx Tribune news interview
- 15 Hosted: Sanbourn & Assts
- 15 Participated: BSEACD modeling

- 17 Participated: GMA-9 O&E committee
- 18 Hosted: Aaron Reed
- 18 Hosted: Carly
- 18 Participated: Texas Monthly news interview
- 21 Hosted: Treasurer/2024 Budget
- 21 Attended: DSWSC Bd. Mtg
- 22 Participated: TAGD panel planning
- 25 Hosted: City of Blanco atty + city manager
- 29-31 Presented: TAGD 2023 Summit

September

- 1 Hosted: Liz Tietz SAEN
- 5 Hosted: Don Rauschuber
- 6 Presented: HCMN Water 101
- 7 Hosted: HTGCD Board
- 8 Participated: Ashley Wayman TML Board Member
- 8 Hosted: Ansel Gomes
- 11 Participated: BSEACD model meeting
- 12 Hosted: Staff Rules Workshop
- 13 Attended: DSUC
- 18 Attended: DSWSC Board
- 19 Attended: BS University
- 20 Hosted: Lon Shell et al
- 22 Attended: Ed Talks
- 26 Participated: GMA-9 – Boerne
- 27 Hosted: BRAAT Pre-meeting
- 28 Participated: HCA Leadership Summit
- 29 Participated: GCD GM Drought Meeting

October

- 4 Hosted: Rules Committee
- 5 Hosted: Board Meeting – Sunset Canyon
- 11 Hosted: Enforcement Workshop
- 11 Participated: DSUC -- Dripping
- 12 Hosted: Sawyer Ranch Offices enforcement Meeting
- 12 Hosted: Mr. Wages – SWTU
- 12 Hosted: Rusty Tarver -- Mirasol
- 13 Participated: RWQPP
- 13 Participated: BRAAT
- 18 Participated: WWSC Meeting
- 18 Participated: GMA-9 Water+DFC 101 -- Bulverde
- 19 Hosted: Spring Flow DFC Mtg.
- 19 Hosted: Rule 16 mtg.
- 20 Attended: Texas Groundwater Invertebrate Forum
- 24 Hosted: Dave Willard
- 26 Participated: One-Water Seminar – Boerne

- 26 Attended: DSWSC Board Meeting
- 27 Participated: Cow Creek GCD Event Prep
- 27 Hosted: Jeff Shindler Fitzhugh Place
- 30 Participated: Mirasol ILA
- 31 Presented: Chairman Perry

November

- 1 Participated: GMA-9 Water + DFC 101 -- Boerne
- 2 Participated: Region L
- 2 Hosted: HTGCD Bd Mtg
- 6 Participated: Shell + Smith + Rogers Water Availability Studies
- 7 Participated: Shady Oaks RV Manager meeting7:
- 8 Participated: SwTGCD Bd Mtg
- 9 Hosted: Kathy Ramsey
- 9 Presented: Hill Country Leadership Institute – Boerne
- 10 Participated: Brian Hunt BEG Field Course
- 13 Presented: KWVH Radio interview
- 15 Hosted: Mirasol staff/legal workshop
- 15 Participated: AgriLife samples drop-off – Wimberley
- 15 Hosted: Silver Creek staff/hydro workshop
- 15 Presented: Tx. St. Hydrogeology Class Presentation – San Marcos
- 16 Participated: Agrilife Well Health Workshop – Wimberley
- 17 Participated: RWQPP
- 27 Attended: DSWSC Board Meeting
- 28 Participated: GMA-9 Regular meeting – Boerne
- 29 Participated: SwTGCD Board Mtg – Oak Hill
- 30 Hosted: Mirasol staff/legal workshop
- 30 Participated: Hays Co GW Model Taskforce meeting at BSEACD

December

- 1 Participated: Region K
- 1 Participated: Mirasol
- 5 Participated: Mirasol
- 6 Participated: GMA-9 DFC workshop
- 7 Hosted: HTGCD Bd Mtg
- 8 Participated: Mgrs' Meeting
- 11 Participated: Rainbow Ranch Spud-in
- 12 Hosted: Rule 16
- 13 Attended: DSUC
- 13 Participated: GMA-9 Workshop
- 14 Hosted: Counsel mtg on AQUA
- 14 Hosted: DFC Mtg w/Dirk Aaron
- 15 Hosted: Counsel Mtg on Mirasol
- 18 Attended: DSWSC Bd Mtg

2. Goal: Controlling and Preventing Waste of Groundwater

2.1. Management Objectives

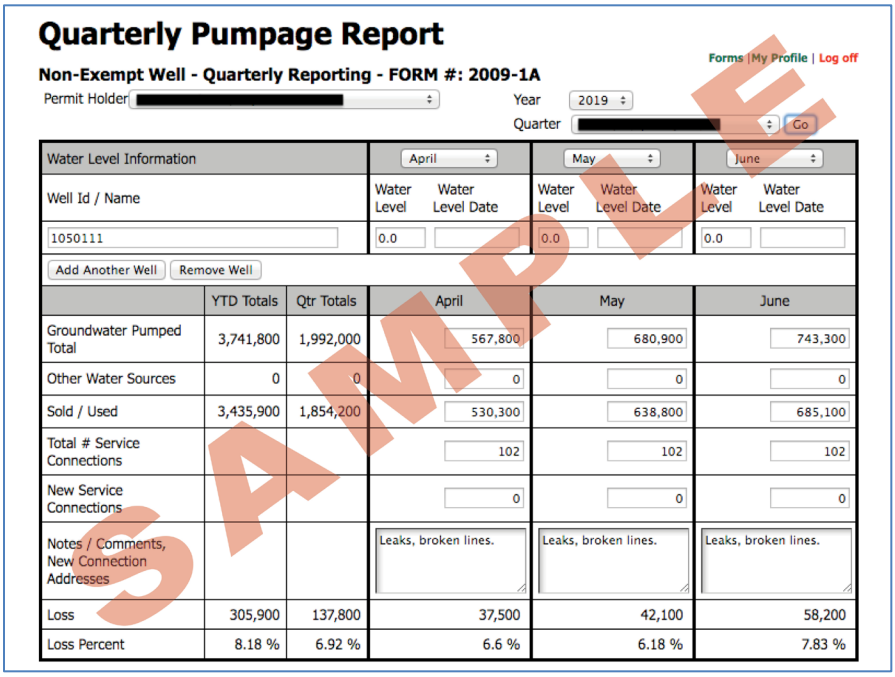
Each year, the District will take complaints from any concerned citizen or entity in the District on cases of waste or possible waste.

Performance Standard

In each Annual Report, the District will include a discussion of the recent issues with waste and recommend any amendments to the rules to prevent the waste of groundwater.

District Staff reports to the Board of Directors during public meetings on the topic of waste. No official public complaints were submitted to the District office concerning waste or possible waste during 2023. However, the District offices did field complaints about excessive irrigation and vanity ponds.

The District relies on the online Quarterly Reporting process that allows all District operating permit holders instant access to enter and review their own production, sales, connections, and percent losses. Communication concerning loss is tied directly to each quarterly report. This gives the permit holder and the District an electronic record of reasons for loss including circumstances such as line-breaks, meter replacement, fires, or flushing. It also gives an indication of historic line loss and information on permittees who have habitually high line loss due to inadequate maintenance[3]. An example of a Quarterly Report can be found in **Figure 1,** below.



Quarterly Pumpage Report

Forms | My Profile | Log off

Non-Exempt Well - Quarterly Reporting - FORM #: 2009-1A

Permit Holder [redacted] Year 2019 Quarter [redacted] Go

Water Level Information			April		May		June	
Well Id / Name			Water Level	Water Level Date	Water Level	Water Level Date	Water Level	Water Level Date
1050111			0.0		0.0		0.0	

Add Another Well | Remove Well

	YTD Totals	Qtr Totals	April	May	June
Groundwater Pumped Total	3,741,800	1,992,000	567,800	680,900	743,300
Other Water Sources	0	0	0	0	0
Sold / Used	3,435,900	1,854,200	530,300	638,800	685,100
Total # Service Connections			102	102	102
New Service Connections			0	0	0
Notes / Comments, New Connection Addresses			Leaks, broken lines.	Leaks, broken lines.	Leaks, broken lines.
Loss	305,900	137,800	37,500	42,100	58,200
Loss Percent	8.18 %	6.92 %	6.6 %	6.18 %	7.83 %

SAMPLE

Figure 1: Quarterly Report showing an example of how line loss is calculated.

[3] Rule 2.1 Waste B, E.

3. Goal: Controlling and Preventing Subsidence

The rigid geologic framework of the region precludes significant subsidence from occurring. Therefore, this goal is not applicable to the operations of Hays Trinity Groundwater Conservation District.

4. Goal: Addressing Conjunctive Surface Water Management Issues

4.1. *Management Objective*

Each year, the District will promote the use of surface water or other alternatives to groundwater in growing areas where groundwater demand is projected to lower the water tables and to reduce stream and spring flow to unacceptable levels.

Performance Standard

The District will strive to meet with the planning departments of major surface water providers within the District at least once per year. The District will summarize these meetings and their outcomes in the Annual Report.

Dripping Springs Water Supply Corporation (DSWSC) and the West Travis County Public Utility Authority (WTCPUA) are the two major surface water providers in the northern portion of the District. They supply wholesale and retail water sourced from the Lower Colorado River Authority (LCRA) Highland Lakes resource. Below is a list of meetings held with DSWSC or WTCPUA.

Meetings*:*

- Charlie Flatten and/or select Board members communicated or met on a more than monthly basis with DSWSC Staff and select Board members on conservation, legislation, permitting, and fee definitions.
- Charlie Flatten and WTCPUA Director and or Board Members met to discuss the PUA's potential expansion of services and/or expansion of supplies to the DSWSC.
- Charlie Flatten serves on both of the District's Regional Water Planning Groups (Blanco/Guadalupe and Colorado River basins) where he monitors future plans to move surface water up into the HTGCD.
- District Staff promotes the use of rainwater at every available interaction with the public in order to reduce the use of groundwater.

5. Goal: Addressing Natural Resource Issues Which Impact the Use and Availability of Groundwater and Which are Impacted by the Use of Groundwater

5.1. *Management Objective*

Each year, the District will make at least one endorsement or contribution to ongoing studies of geologic, environmental, or hydrogeologic studies being performed in the district area.

Performance Standard

Each year, a summary of the District's contributions or endorsements of ongoing studies will be included in the Annual Report.

COMPLETED STUDIES

Science Reports

- *Jacob's Well Spring: a Hydrogeological Review; Presentation before the Texas Groundwater Association Annual Meeting, San Marcos, March 30, 2023 (Boghici)*
- *Evaluating Compliance With the Desired Future Conditions Within Hays Trinity Groundwater Conservation District* (Boghici)
- *Recommendation to the HTGCD Board for the Establishment of a Streamflow-Based Ten Percent Production Cutback in Response to Drought (Boghici, Flatten)*
- *Research Proposal: Toward Developing A Quantifiable and Updatable Dynamic Model of Aquifer Volume for the District: Material Balance to Trigger Public Awareness & Conservation (Boghici, Flatten)*
- *Research Proposal Submitted in Response to the TWDB Surface Water Stakeholder Solicitation for 2024-2025 (Boghici, Flatten)*
- *Estimating Time Series Storage Changes for the Trinity Aquifer in the Hays Trinity Groundwater Conservation District (Boghici)*
- *Comments on the Woodcreek Aquifer Test Report (Boghici)*
- *District: Little Blanco River Gain-Loss Study* -- in press (Wierman, Walker, Webster, Boghici)
- *Potentiometric Surfaces of the Lower and Middle Trinity Aquifer in Southwestern Hays County, Texas ongoing* (Webster, Boghici)
- *Identifying The Source Of Young Groundwater Fraction In Lower Trinity Samples – ongoing* (Boghici)

Science Reports by others using HTGCD data and resources

- *Preliminary Report on the Installation of Two Multilevel Monitor Wells Near Jacob's Well:* BSEA/CD (Smith, Watson, Camp)

- *Hydrogeologic Investigations of the Trinity Aquifers in Western Travis County along a Portion of Lake Travis and a Transect from Northern Hays County to Bell County, Central Texas:* BEG (Hunt, Cockrell, Smith)

Policy Reports

- *Tools for Managing Groundwater in the Texas Hill Country* ©2023 Hill Country Alliance (M. Bruno, Flatten, Fieseler, Puig-Williams, Enders, Allen, Sodek)
- *Land, Water, Sky, and Natural Infrastructure Plan* ©2023 Hill Country Alliance (K. Romans, et. al.)

- *2022 Annual Report*

ONGOING STUDIES

Regional Recharge Study Zone: Rule 16 calls for continued data collection, research, and scientific development of the hydrogeology of the Blanco River Basin as defined. Staff have been collecting new data (water levels in wells, water quality and isotopy) and compile available information to delineate and characterize the source(s) of the springflow in the Pleasant Valley Springs.

Horseshoe Ridge Middle Trinity Monitoring Well: With assistance from the Texas Water Development Board, we have equipped the monitoring well with a pressure transducer, a data cable and a datalogger for hourly water level data collection. Staff have been visiting the site quarterly to download the data and have been preparing to upgrade the site to GOES satellite telemetry in 2024. Water level readings are posted on the TWDB Water Data For Texas website.

Dedicated Monitor Well Project: The HTGCD Dedicated Monitor Well Project continued in 2023. The Dedicated Monitor Well Project is designed to provide long-term water-level monitoring and ongoing groundwater quality data from carefully selected well sites in western Hays County. A complete aquifer formation evaluation program was carried out at each borehole, including core and cutting samples analyses, geophysical logging, down-hole video, aquifer testing, and water sample recovery. An extensive technical report was completed for each location and posted to the District website. Funding for the project came from HTGCD, Hays County, Dripping Springs Water Supply Corporation, and Barton Springs Edwards Aquifer Conservation District (BSEACD). Technical support and assistance were provided by District Staff, the Blanco Pedernales Groundwater Conservation District, BSEACD, Edwards Aquifer Authority, Texas Water Development Board, the University of Texas Bureau of Economic Geology, and the Texas State University Meadows Center for Water & the Environment. There is also outstanding cooperation and assistance from local landowners who allow District access to their properties.

As a result, continuous water level data and periodic water quality samples are collected from the dedicated monitor wells and made available to the public. Through ongoing monitoring of the dedicated wells, the District continues to expand the reliable long-term record of water levels and groundwater quality, a critical dataset for informing groundwater management decisions.

Blanco River Aquifer Tool for Water and Understanding Resiliency and Sustainability Trends (BRAAT): HTGCD technical staff worked with a group of geoscientists led by the Meadows Center to develop the second phase of this surface-groundwater interaction-based model. Phase 2 will include the development of a numerical model from the conceptual model, which will have the capabilities to simulate groundwater recharge, spring discharge, flow in the Trinity Aquifer, and surface water-groundwater interactions. The groundwater flow model will provide HTGCD, BSEACD, and Hays County with a valuable tool for evaluating groundwater availability in Hays County and pumping impacts to the Trinity Aquifer, springs, and surface water. See *Blanco River Aquifer Assessment Tool A Tool to Assess How the Blanco River interacts With Its Aquifers: Creating the Conceptual Model* (Martin et al., 2019).

District Hydrogeological Analyses of the Trinity Aquifer System: Hydrogeologic data from the Trinity Aquifer was collected and analyzed during 2022. This is an ongoing project designed to acquire and interpret pertinent technical data and to apply this information to District operational management. Data includes geophysical well logs, cuttings samples, groundwater levels, groundwater samples & chemical analyses, pumping test reports, surface geology, and groundwater use (pumpage). This information is maintained in the District's growing database and is used in conjunction with the TWDB groundwater database. Local and regional modeling projects such as the TWDB Conceptual Model of the Hill County Trinity Aquifer and more local modeling will incorporate this data into their analyses.

Jacob's Well Groundwater Management Zone: In March 2020, HTGCD Board of Directors approved the creation of the Jacobs Well Groundwater Management Zone (JWGMZ) via Rule 15. This project was the culmination of technical staff, an interagency group of groundwater scientists, and stakeholder collaboration. Staff began an implementation process to guide permittees in the regulatory process. The Board also began JWGMZ specific Drought Stage declarations based on triggers set by rule. Rule 15 expressly specifies that the Board will take no enforcement action until March 2021. Note: An April 2021 Public Hearing and Board action delayed enforcement until March 2022 due to Covid concerns. 2023 Board action made several changes to Rule 15's drought management and curtailment provisions to create a more predictable assessment of annual production during drought. Board action also recognized previous conservation achievements by permittees through the grant of conservation credits that are applied to curtailment baselines.

March of 2022 saw final implementation and full permitting of all non-exempt groundwater users in the Zone. All rules will be applied to permittees. The first round of overproduction NOAVs were applied to qualified permittees in early 2023.

HTGCD Surface Water Monitoring Project: Groundwater-surface water interactions are a critical component of the story of recharge and discharge within the Trinity Aquifer in western Hays County. By periodically measuring surface water flows, hydrogeologists develop a greater understanding of how these interactions impact the aquifer and change over time. This ongoing project will rely on continued data gathering. Technical staff will continue to collect surface water flow data in the Blanco, Onion Creek, and Barton Creek basins to develop a greater understanding of groundwater-surface water interactions in the District.

Technical Staff will also continue to collaborate with Meadows Center for Water and the Environment scientists in the ongoing *Little Blanco Occurrence of Flowing Water* surface water – groundwater interaction study.

Lower Trinity Project: The Project was initiated in 2012 to evaluate the potential for an alternative groundwater source for western Hays County. Previous Lower Trinity studies have consisted of aquifer testing to define aquifer parameters and overall groundwater availability and adding Lower Trinity wells to the District's Monitoring network. The hydrogeological evaluation of the Lower Trinity Aquifer was given a higher priority in 2023 by new staff hydrogeologist Radu Boghici, P.G.-- with the addition and analyses of geophysical logs and water samples. The northeastern part of the District is an area of ongoing study due to rapid development where the Middle Trinity Aquifer appears to be dewatered, and new wells are finding minimal production from the Lower Trinity Aquifer.

6. Goal: Addressing Drought Conditions

The continued health and potential sustainability of the Trinity Aquifer is the primary informer of the **(Figures 6, and 7)** District's outlook and actions. Drought is the most difficult variable in the hydrologic equation to manage. the District employs a variety of drought management tools ranging from education to prescribed curtailment.

2022 saw the first District-Wide 40% Emergency Stage in the history of the District. Throughout 2023, weather conditions remained dire with below-average rain fall and above average stretches of high temperatures, and the District remained in Emergency Drought Stage for the entirety of 2023. Emergency Stage includes a 40% curtailment of permitted volumes District-wide, and 30% curtailment of historic use in the Jacobs Well Groundwater Management Zone. For perspective, two rain gauges monitored by the district show 35.4 and 37 inches of average rainfall for Dripping Springs and Wimberley, respectively, but only

18.7 and 19.9 inches in 2023.**Figure 2** shows how drought impacted Texas in 2023 (Source: U.S. Drought Monitor).

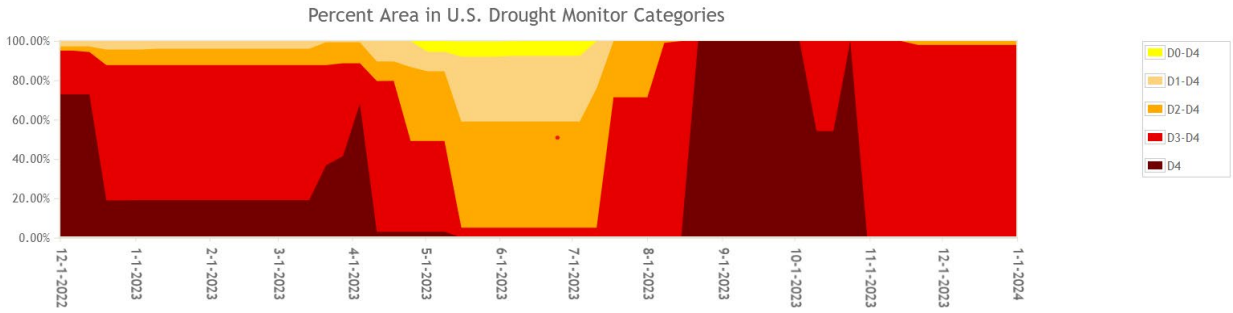


Figure 2: Percent of Texas in Drought Throughout 2022. D0 = No Drought, D4 = Max Drought

The District fulfilled requirements and enforced rules associated with the Jacob's Well Groundwater Management Zone, which were created to protect Trinity Aquifer resources in the Jacob's Well Springshed.

The ongoing Hill Country drought, new language required by the Texas Legislature, conforming changes to adhere to Chapter 36, Texas Water Code, and general housecleaning resulted in a series of updates to District Rules. The District publicly noticed discussion on the rules in public meetings in July, August, September, and October, with public hearing and Board action in November. The District has the authority to carry out its statutory purposes from expressly granted and necessarily implied legal authority and has some ability to reasonably decide how best to regulate groundwater within its jurisdiction. To that end, an overview of 2023 rule changes follows.

- Rules 1, 3.6, and 5.6 were adjusted due to mandates by the Legislature regarding enhanced petitioning processes and updated export language.
- Rule 2 definitions were updated where necessary to conform with rules and code.
- Rule 3 changes included updated District language to conform with water code, especially with regard to required drilling permits, an adjunct to the District's well construction notifications.
- Rule 4 changes included changes to spacing requirements, drilling permits required by water code, and an application dormancy policy.
- Rule 6 had plugging and capping language adjustments to conform with Ch. 36.
- Rule 9 defined the District's prohibition on Waste and Pollution. Notably, all Groundwater Conservation District mandates in Chapter 36 include groundwater *quality*.
- Rule 10 changes cleaned up language relating to enforcement and NOAV procedures, including adjusting the language to conform with statute, and moved the Fee and Settlement Schedule to a Board Resolution instead of being defined within the rule.
- Rule 13 was amended to include a mandatory 10% Conservation Stage drought curtailment as well as the use of the Palmer Drought Severity Index in determining the

current drought stage. Early in 2023, Rule 13 was amended to be more responsive to drought and recharge, allowing any of the indicators that persisted for 30 days to trigger going into drought, and requiring both river flows at 60 days to indicate sufficient recharge to come out of drought.
- Rule 15 received clean up and adjustments to conform with changes in other rules.

Additionally, the District conducted scientific and policy reviews (See Section XX) in coordination with outreach processes in order to enact several new drought rules (Chapters 11, 13, and 15) that created restrictions on new well construction notices and new permits or permit amendments during Critical or Emergency Drought Stages.

- Rule 11.1.4(B): Suggests all pump and aquifer test discharge have a beneficial use
- Rule 13.3.2: Defines Drought Stage names and curtailment rates
- Rule 13.3.3(A-C): Strengthens restrictions on pond-filling during drought, prohibits new permit applications & permit amendments for additional production, and prohibits new non-exempt well construction during the top 2 drought stages
- Rule 15.2.4 (B): Prohibits pond-filling from non-exempt wells during drought in the JWGMZ

The District is fulfilling its Rule 16 requirement to gather scientific data on the 56-square mile Regional Recharge Study Zone. See Appendix, Section 3:

Water level percentiles in **Figure 3** represent the water level elevations in wells as a percentage relative to the maximum historical water levels. Historical values are from 2008 to 2019. A percent of zero would represent the lowest historical water level, while 100 percent represents the highest historical water level. Shades of purple represent negative values, signifying water levels below the 2008-2019 minimum.

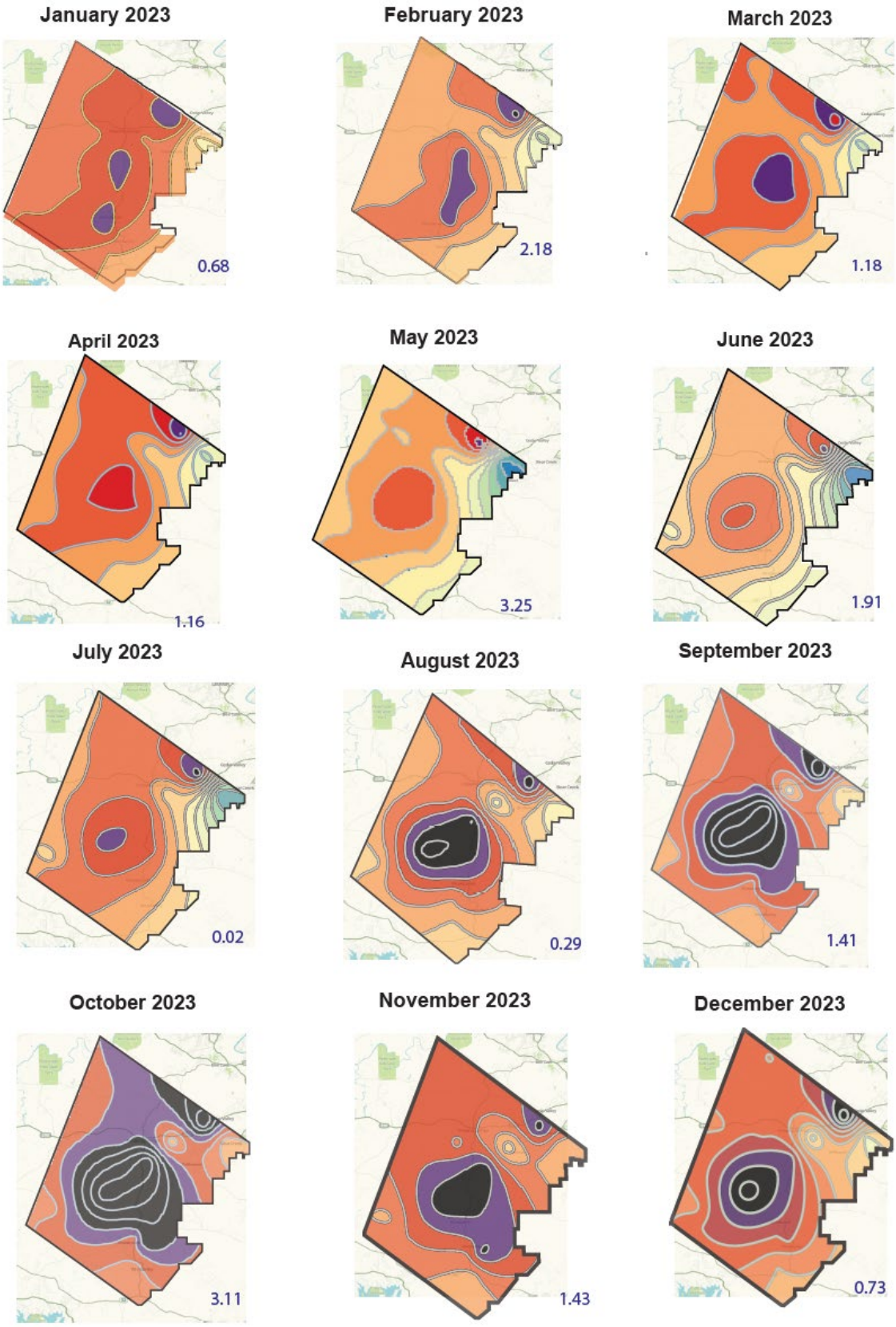


Figure 3: Timestep Water Level Percentiles for the Middle Trinity Aquifer

6.1. *Management Objective*

The District has developed individual permit specific User Drought Contingency Plans to protect and conserve groundwater during critical drought conditions. The plan will be updated as additional data becomes available.

Performance Standard

The District will post a copy of the plan on the HTGCD website and will include an updated Drought Contingency Plan, available to end-users, in the Annual Report.

The District updated its Drought Contingency Plan in 2022 to reflect new drought requirements for the JWGMZ (see Appendix, Section 3). The District updated its User Drought Contingency Plan (UDCP) for all non-exempt operating permit holders (see Appendix, Section 3). The UDCP is available for review on the District's website under Forms. The District updated its Water Conservation Plan (see Appendix, Section 3) which is also part of the paperwork required by the District for all new and amended operating permit applications to be administratively complete.

A Drought Production Cutback Chart is included with each new permit, amended permit, and permit renewal. An example of a Drought Production Cutback Chart can be seen in **Figure 4**, below. The cutback chart divides the permitted amount of each permit to show an exact monthly production, in gallons, for every possible drought stage so permit holders can prepare for Board-declared drought conditions.

6.2. *Management Objective*

Each quarter, the District will check the National Weather Service – Climate Prediction Center website (https://www.ncdc.noaa.gov/temp-and-precip/drought/weekly-palmers/) for updates of the Palmer Drought Index. The District will download the updated Palmer Drought Severity Index (PDSI) map and check for periodic updates on www.waterdatafortexas.org/drought.

Performance Standard

Quarterly, the District will assess the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps will be included with copies of the quarterly briefing in the District Annual Report to the Board of Directors.

The General Manager's Monthly Report includes a briefing on the status of drought within the District and is given to the Board of Directors during Board Meetings. The briefing includes maps from the US Drought Monitor and the Palmer Drought Severity Index, monitor well level averages, and HTGCD drought trigger updates (see Appendix, Section 3).

HTGCD Staff records and addresses all filed complaints of waste or possible waste during the drought briefing. HTGCD Staff provides a monthly review of the current drought status to the Board of Directors at regular open meetings.

6.3. *Management Objective*

Each year, the District will collect monthly water level data from a network of monitoring wells.

Performance Standard

Each year, a report of the District water level collection activities, including a table of the water levels measured in District monitoring wells, will be included in the annual report.

Monthly, District Staff collects water levels from dedicated District monitor wells (**Figure 5**). The information collected is entered into and displayed on the District's website as hydrographs transposed with rainfall data collected from NOAA The public can access the District's website for more specific data by scrolling over the hydrographs to see elevation above mean sea level and surface to top of water level measurements. Hydrographs for Mount Baldy and Henly Church wells (**Figures 6 and 7**), and the flow rates from the Blanco and Pedernales Rivers are used to measure the current health of the aquifer. One can find current flow rates of the Blanco and Pedernales Rivers on the District Drought Management webpage.

In addition, District staff downloads quarterly data from 18 transducer wells within western Hays County. This information is located on the District's website for public use.

See Appendix, Section X for the 2023 Monitor Well Levels chart describing monthly water level measurements.

Drought Production Cutback Chart

[Permittee] 5.12 Acre-ft. Tier: 2

2021 1,668,357 Gallons

Month	Gallons Produced	Monthly % of Annual Permit	Drought Stage	Suggested Allotment	Drought Stage 1 Voluntary 10%	Drought Stage 2 20%	Drought Stage 3 30%	Drought Stage 4 40%
January		6%		100,101	90,091	80,081	70,071	60,061
February		7%		116,785	105,106	93,428	81,749	70,071
March		7%		116,785	105,106	93,428	81,749	70,071
1st Quarter		*20%*						
April		7%		116,785	105,106	93,428	81,749	70,071
May		8%		133,469	120,122	106,775	93,428	80,081
June		10%		166,836	150,152	133,469	116,785	100,101
2nd Quarter		*25%*						
YTD		*45%*						
July		12%		200,203	180,183	160,162	140,142	120,122
August		12%		200,203	180,183	160,162	140,142	120,122
September		10%		166,836	150,152	133,469	116,785	100,101
3rd Quarter		*34%*						
YTD		*79%*						
October		8%		133,469	120,122	106,775	93,428	80,081
November		7%		116,785	105,106	93,428	81,749	70,071
December		6%		100,101	90,091	80,081	70,071	60,061
4th Quarter		*21%*						
TOTALS		*100%*						

SAMPLE

Figure 4: Example of a Drought Production Cutback Chart

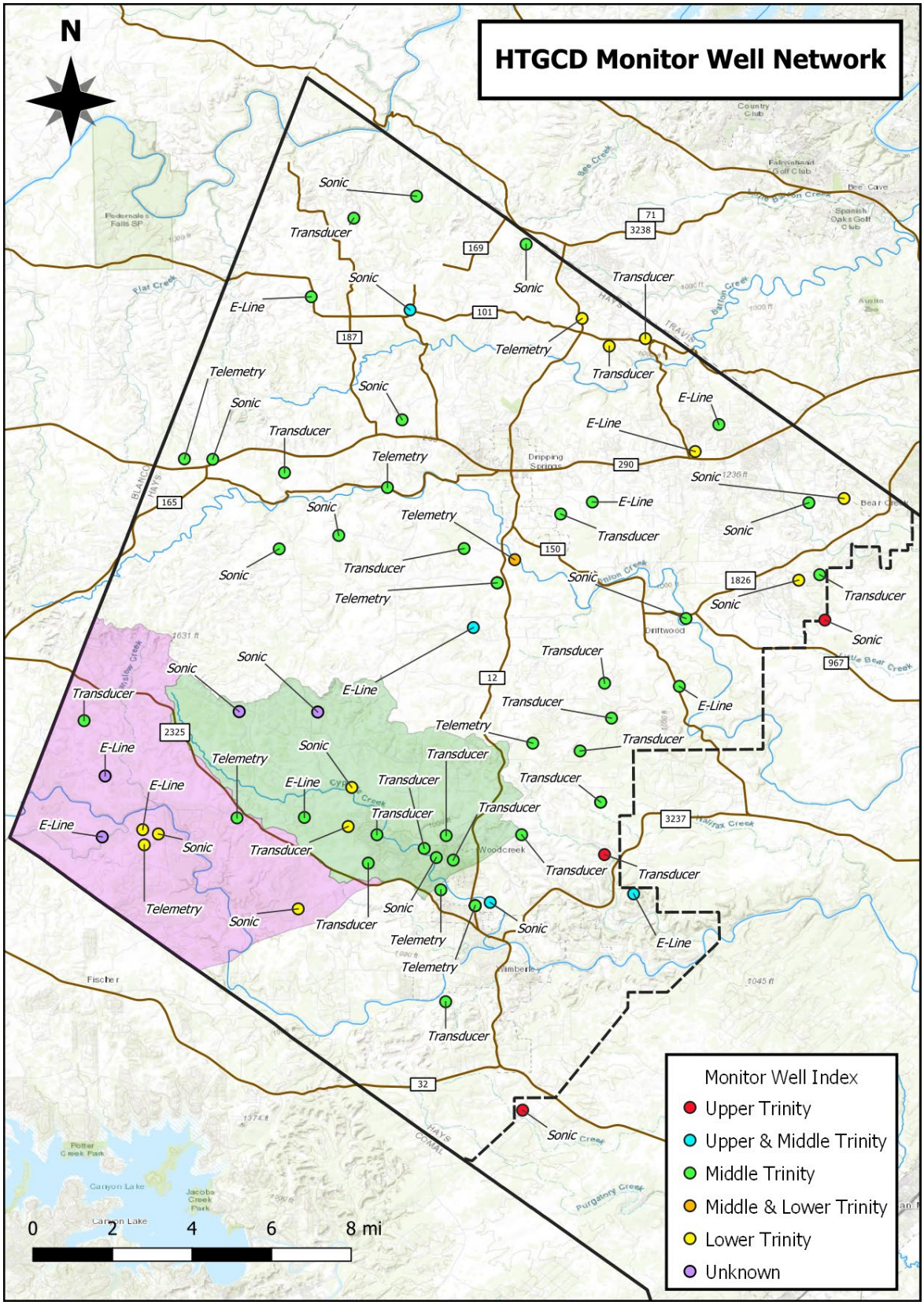


Figure 5: District Well Water Level Monitoring Network

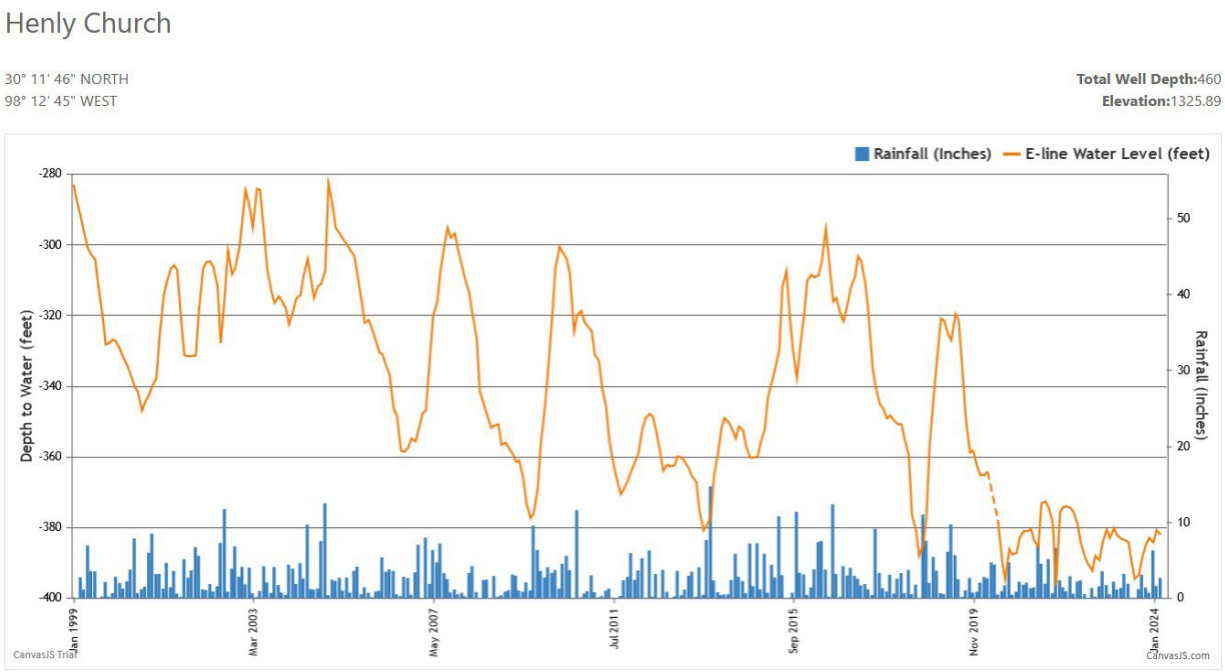


Figure 6: Henly Church Well Hydrograph Showing Water Level Elevation (ft. above sea level) and Monthly Rainfall (inches).

Mt. Baldy

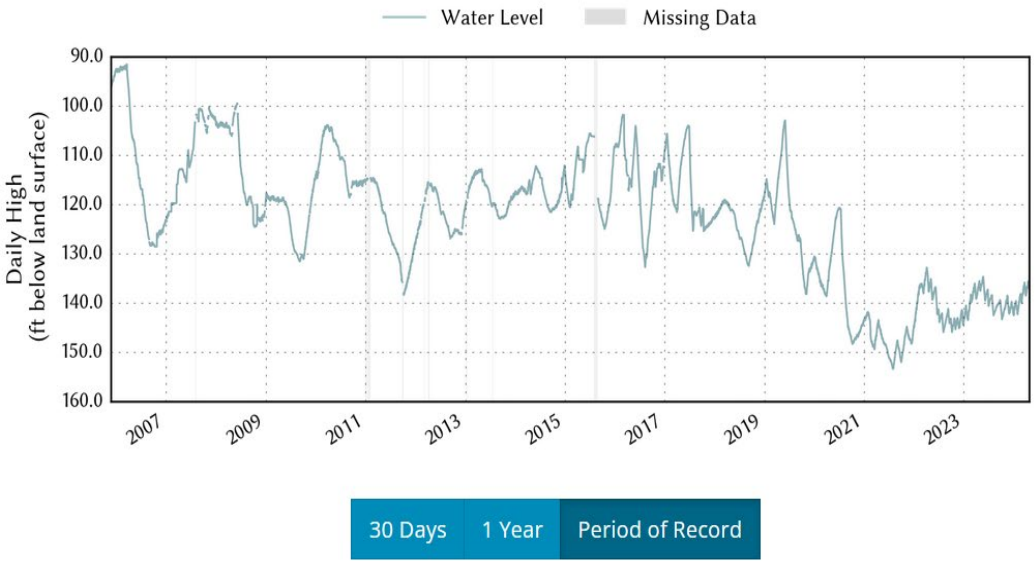


Figure 7: Mount Baldy Well Hydrograph Showing Water Level Depth (ft. below land surface).

6.4. *Management Objective*

Each year, the District will monitor data collected from the U.S. Geological Survey (USGS) water-flow monitoring stations on the Blanco River, Pedernales River, Onion Creek, and at Jacob's Well Spring.

Performance Standard

Each year, the District will review the prior year's monitoring data with local, state, or federal organizations and prepare a summary to be included in the Annual Report.

The Pedernales and Blanco River flow, and the Palmer Drought Severity Index are HTGCD's General Purpose Drought Indicators. Current conditions of the Drought Indicators are hosted on the Drought Management page of the District website.

Jacobs Well Spring flow is measured monthly for current conditions as a marker for drought curtailment in the JWGMZ.

7. Goal: Addressing Conservation

7.1. *Management Objective*

Each year, the District will submit one article for publication regarding water conservation to at least one newspaper of general circulation in Hays County.

Performance Standard

Each year, a copy of the article submitted for publication will be included in the Annual Report.

The District submitted, appeared in, or provided information in the following articles for publication in the press;

- KWVH Radio: Rootin' Around: *Classic Tales Of The Perils, Loss, Hope & Redemption Of Water -- Our Most Precious Resource*. By Michael August. November 18, 2023
- KVUE-ABC Television News: *Texans To Decide On $1B Fund To Create New Water Supplies, Repair Deteriorating Infrastructure*. By Jenni Lee. November 3, 2023
- San Antonio Express News: *Protecting The Trinity: Why The San Antonio Area's Other Aquifer Is So Important ~The Trinity Aquifer Not Only Serves Much Of The Hill Country, But Is Also Crucial To The Health Of The Better-Known Edwards Aquifer*. By Liz Teitz, Wesley Ratco. October 30, 2023
- Hays Free Press: *Aqua Texas Negotiates With Groundwater District On Overpumping Fine - Aquifers Drying Up Cause Residents To Fear Water Shortage*. By Megan Navarro. October 4, 2023
- Texas Monthly: *Who's Killing Jacob's Well?* By Forrest Wilder. August 28, 2023

- Wimberley View: *Aqua Texas Fined Almost $450,000 For Overpumping*. August 24, 2023
- Texas Tribune: *Heat, Drought And Population Growth Have Stressed Aquifers That Supply Water To Millions Of Texans*. By Dylan Baddour, Inside Climate News. August 16, 2023
- The Big Bend Sentinel: *Our Water Matters*. By Trey Gerfers. September 6, 2023
- KVUE-ABC Television News: *Aqua Texas Ignored Pumping Limits On Aquifer That Feeds Jacob's Well, Report Says*. August 17, 2023
- My San Antonio: *Texas Utility Company Ignored Pumping Limits, Endangering Jacob's Well*. By Steven Santana. August 16, 2023
- KUT Radio News: *Utility Company Aqua Texas 'Ignored' Pumping Limits In 2022, Threatening Jacob's Well*. By Maya Fawaz. August 15, 2023
- KXAN-NBC Television News: *Hays Groundwater District Says Water Company Overused 89M Gallons In 2022, Impacting Jacob's Well Zone*. By Taylor Girtman. August 7, 2023
- Wimberley View: *Conservation District To Address Overpumping*. *May* 3, 2023
- Wimberley View: *Local Water Groups Host Groundwater Workshop For Hays County*. April 12,2023
- Wimberley View: *Legislators Propose How To Manage Water In Latest Round Of Bills*. March 15, 2023

In addition to press releases, the District maintains a robust Education and Outreach program and serves as a liaison between the Board of Directors, the public, the press, private entities, Universities, and other GCDs or agencies.

- Presentations/Panel Appearances
  - *Classic Songs On the Perils, Loss, Hope & Redemption of Water -- Our Most Precious Resource*. *Rootin' Around with Mike August*. KWVH 94.3 FM Wimberley, Texas. Guest and content provider. 2023
  - *Karst Groundwater Drought Management:* Dr. Robert E. Mace's fall 2023 Groundwater Resources class (GEO-4334). San Marcos Texas
  - *Groundwater Workshop - Coordinated Groundwater Management Tools:* Cypress Creek Project: 2023 Wimberley Texas
  - *Managing Groundwater in Drought* - Texas Association of Groundwater Districts - 2023 Texas Groundwater Summit. John Dupnik PG (Deputy Executive Administrator, Water Science and Conservation, TWDB), Kody Bessent (CEO, Plains Cotton Growers, Inc.), Amy Hardberger, PG, JD (McCleskey Professor of Law; Director, Texas Tech Center for Water Law and Policy; Texas Tech School of Law), Drew Satterwhite (G.M. Canadian River Municipal Water Authority). San Antonio Texas.
  - *From Science to Management: The Role of GCDs* - Hill Country Leadership Institute: 2023. Kickapoo Springs (Ted Flato) Ranch, Edwards County. With Katherine Romans (E.D. Hill Country Alliance), Rebeca Gibson (Mayor of Bandera & Bandera County River Authority & Groundwater District Director), Curt Campbell PE (Senior VP Engineering & Natural Resources · Westward Environmental & Cow Creek GCD Director), Ben Eldredge (VP Conservation, Cibolo Conservancy & Cow Creek GCD Director)

- Jacob's Well Spring: a Hydrogeological Review; Presentation before the Texas Groundwater Association Annual Meeting, San Marcos, March 30, 2023 (Boghici)

- Community Engagement
  - Dripping Springs Founders Day (tableing)
  - *Groundwater: Planning for the Future*:
    - Upper Guadalupe River Authority, Kerrville Texas ℗ Nov. 2023
    - Herff Farm, Boerne Texas ℗ Nov. 2023
    - Bulverde Public Library, Bulverde Texas ℗ Oct. 2023

- ***Water Wise Speaker Series*** with live presentations from
  - *New Groundwater Modeling Tool*: Jeff Watson PG, Barton Springs/Edwards Aquifer Conservation District: February 2, 2023
  - *Jacobs Well Groundwater Management Zone*: Marcus Gary PhD, Edwards Aquifer Authority: May 4, 2023
  - *Deep Aquifer Creatures*: Andy Gluesenkamp PhD, San Antonio Zoo:

- **District Forms** update program

- 20 **Social Media** posts

- **Collaborative efforts**
  - Active communication and collaboration with the **Meadows Center for Water & Environment**
  - Active communication and collaboration with various **University of Texas** Schools, and **Texas State University** Departments of Geography and Biology
  - Active collaboration with the **Hill Country** Conservation Network and created input for the **Hill Country Natural Infrastructure Plan**
  - Active collaboration with the Barton Springs (Travis/Hays Co) **Regional Water Quality Protection Plan** working group (Austin Water, Austin Watershed Protection, SOS, Save Barton Creek Alliance, WVWA, Hays County, Travis County LCRA, BSEACD, SwTCGCD, City of Buda, &tc)
  - Active collaboration with the **Hill Country "*One Water*" Delegation** (NBU, SAWS, GBRA, Austin Watershed Protection, Mitchell Foundation, Meadows Center for Water & Environment, City of Buda, Hill Country Alliance, Texas Water Alliance, Texas Water Market Makers)
  - Active communication and collaboration with **local/regional water agencies**:
    - Aqua Texas
    - Wimberley WSC
    - Dripping Springs WSC
    - West Travis Co Public Utility Authority
    - Guadalupe Blanco River Authority
    - Lower Colorado River Authority
    - Barton Springs/Edwards Aquifer Conservation District
    - Edwards Aquifer Authority
    - Blanco Pedernales GCD

- Southwest Travis County GCD
- Comal County GCD
- Cow Creek GCD
- Burnet County GCD
- Hill Country Underground Water District (Gillespie County)

- Active communication and collaboration with **local/regional conservation non-profits**:
  - Cypress Creek Watershed Protection Program
  - (Wimberley Valley) Watershed Association
  - Friends of Blue Hole
  - Hill Country Alliance
  - The Nature Conservancy
  - Hill Country Conservancy
  - Hill Country Conservation Network
  - Environmental Defense Fund
  - National Wildlife Federation

8. Goal: Addressing Recharge Enhancement

Due to the geologic and hydro-stratigraphic structure of the Trinity sub-aquifers, the implementation of significantly effective recharge enhancement to the primary source aquifer may not be practical. Current interpretation of geologic data suggests that downward leakage within the Trinity Group is limited to specific stream segments. Recharge takes place within the geographic confines AND west of the District near the sedimentary wedge-edge of the water bearing rock units through diffuse infiltration. Given the location of suspected recharge and its nature, neither general land management nor focused enhancement practices may be feasible. Therefore, until additional Hydrogeologic data is available, this goal is not applicable to the operations of this District.

9. Goal: Addressing Rainwater Harvesting

9.1. *Management Objective*

Each year, the District will make at least one endorsement or contribution to programs that encourage, install, educate, or assist individuals in the implementation of rainwater harvesting systems in the District area.

Performance Standard

Each year, the District will provide records of contributions or promotions of rainwater harvesting events or companies in its Annual Report.

The HTGCD's Water Wise Speakers Series features videos on rainwater harvesting and can be viewed on the Districts You-Tube Channel.

The District encourages the use of rainwater collection systems on all new homes, businesses, and existing buildings during every monthly Board Meeting as part of the General Manager's Report.

Additionally, District staff receive TCEQ mailings concerning new business development within the District's boundary. A review of the packets includes direct communication, not only with TCEQ about the project, but also with the developer and their engineer. This includes inquiry about the installation of rainwater harvesting on common buildings or the ability of residents to install rainwater harvesting equipment.

10. Goal: Addressing Precipitation Enhancement

This goal is not applicable to the operations of this District.

11. Goal: Addressing Brush Control

11.1. *Management Objective*

The District will attend or contribute to at least one event each year that promotes and educates the public on proper land management practices.

Performance Standard

Each year, the District will provide records of contributions or promotions of land management events or companies in its Annual Report.

District Staff participated in the Texas Hill Country Conservation Network's *Hill Country Natural Infrastructure Plan*. This project is focused on determining conservation metrics in the Hill Country and advancing conservation measures moving forward.

District staff attend and participate in the monthly Regional Water Quality Protection Program which focuses local agency and NGO capacity on a variety of land management best practices including brush control in the Edwards Aquifer Contributing and Recharge Zone.

District staff promotes recharge of the aquifer through such means as proper brush management and reestablishment of deep-rooted native grasses to promote infiltration into the aquifer during monthly Board Meetings in the General Manager's Report.

The District also provides educational materials for the public to take home on the subject of native plants, rainwater harvesting, aquifer storage and recovery, and other educational topics.

12. Goal: Addressing Desired Future Conditions (DFCs)

12.1. *Management Objective*

The District is working within the framework of Groundwater Management Area- 9 (GMA-9) to upgrade and maintain a well database map and files that will identify all District monitoring wells in the management area. The District will work with GMA-9 and their consultants on an acceptable method to analyze and report drawdown levels relative to the DFC. Deliverables may include potentiometric surface maps of the Middle and Lower Trinity Aquifers and selected hydrographs plus other documents generated by the consultants.

Performance Standard

Each year, the District will review the average drawdown of at least two Trinity Aquifer monitor wells, one in each Planning Region, against the DFC projected average regional drawdown for western Hays County. The District shall provide a summary in its Annual Report.

Texas Regional Water Planning requires that all Districts across the Hill Country Trinity Aquifer work together as a Groundwater Management Area (see **Figure 8**, page 28) to develop and monitor a 50-year aquifer level management goal. This planning goal is known as a Desired Future Condition (DFC). The DFC for the Trinity aquifer-wide is 29-feet of average drawdown over 50-years. The TWDB has scientifically quantified that average drawdown as a volume—and allotted the District 9,098 acre-feet/year of Modeled Available Groundwater (MAG).

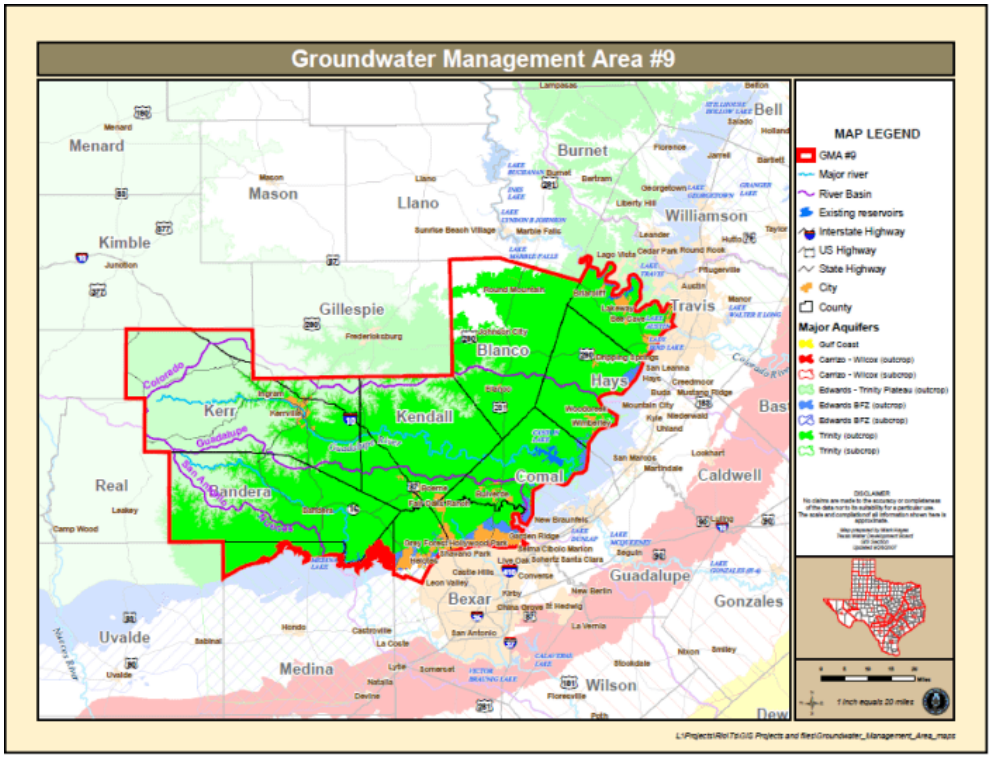


Figure 8: Map of Groundwater Management Area 9

Water Planning Region K:

Henly Church Hydrograph

Applying a trendline to the Henly Church hydrograph from the previous ten years (2013 – 2023) displays decreasing water levels for that period (-4.45 ft./yr.) (Figure 1). This would indicate a water level *decrease* of 44.50 ft. from 2013 – 2023. Evaluating the water level trendline for the entire period of record for this well (1999 – 2023) shows a historical trend that is still negative but has a *smaller decrease* of -2.75 ft./yr., resulting in a 66.0 ft. drop in water level over that time period. **Figure 9** demonstrates the difficulties of applying a trend line to a small sample size.

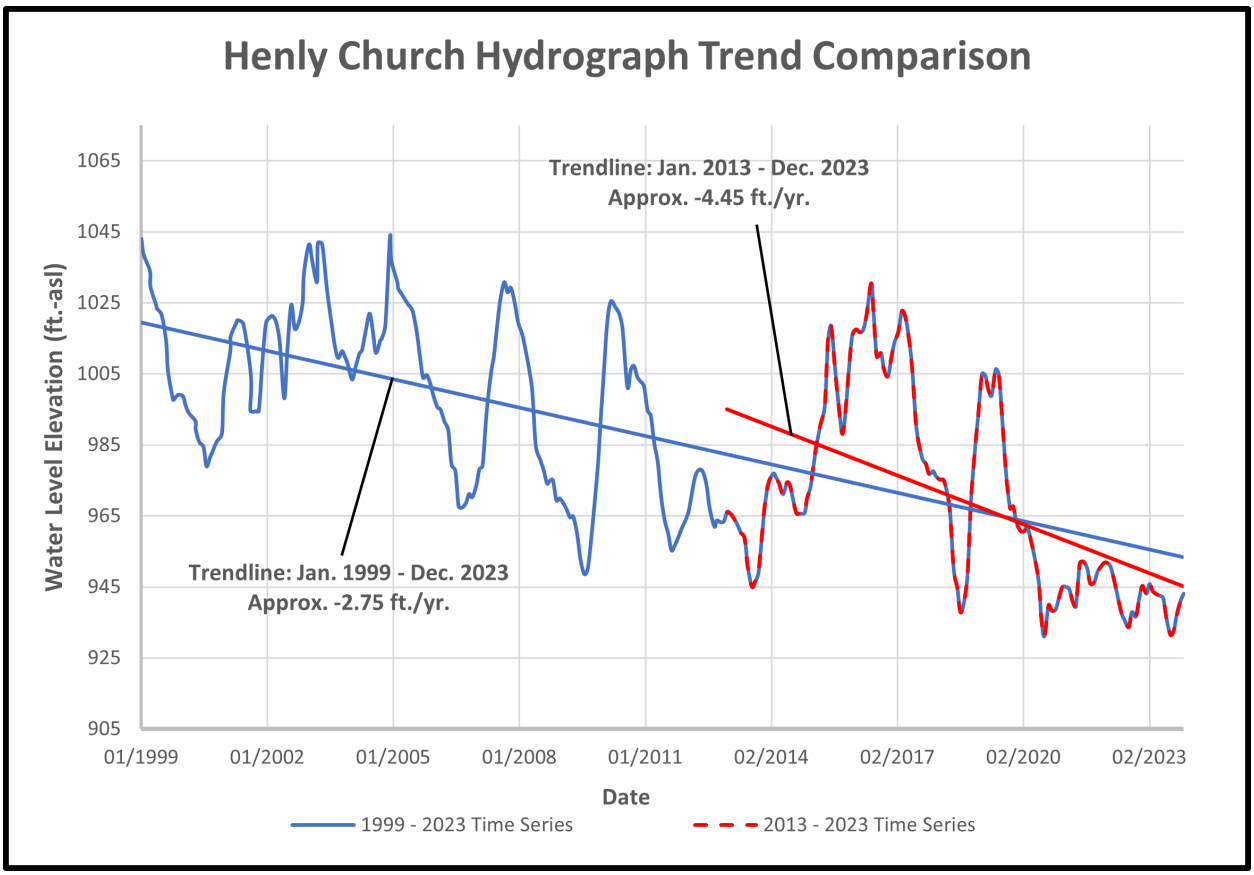


Figure 9: Henly Church well water level trendline comparison showing data from January 2013 to December 2023. The graph shows two trendlines, the blue starting in January 1999, the red starting in January 2013.

Water Planning Region L: Glenn Hydrograph

The Glenn hydrograph trendline is negative (decrease in water level over time) at a rate of -1.25 ft./yr. This would indicate a *decrease* of 18.75 ft. during the 2008 – 2023 time period (**Figure 10**). Like the Henly well, the Glenn well experiences large seasonal fluctuations in water level that make accurate assessment of water level trends difficult to conduct. As such, caution should be exercised when using trendlines to evaluate long-term karst aquifer trends.

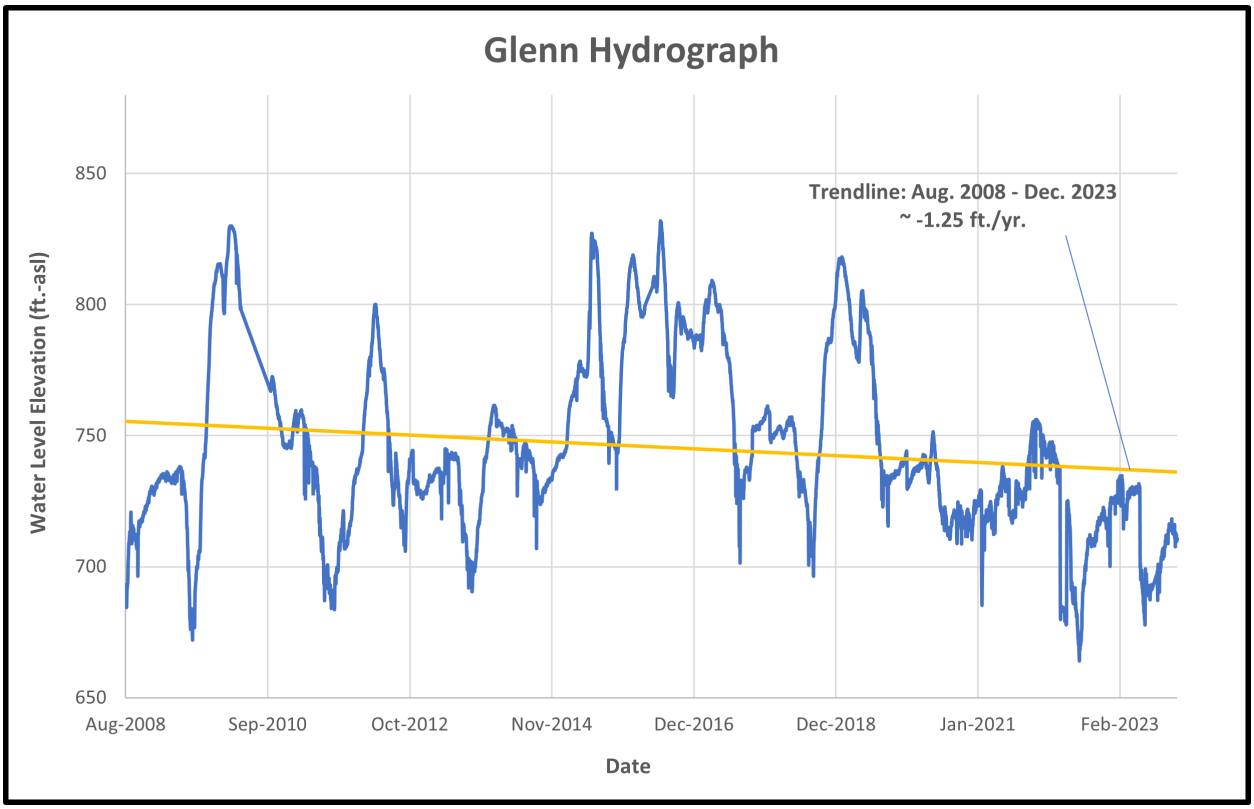


Figure 10: Glenn Well Hydrograph showing the trendline from August 2008 to December 2023.

12.2. *Management Objective*

The Modeled Available Groundwater (MAG) for the Trinity Aquifer in the District is derived from the DFC and requires frequent review against estimated pumpage.

Performance Standard

The District shall prepare an Annual Report of MAG estimated pumpage to monitor District compliance. A summary shall be presented to the District Board and made available to the public and included in the Annual Report.

The Available Groundwater HTGCD Trinity Aquifer System chart (**Table 1**, page 32) has been updated for 2023 and includes estimated exempt use production numbers and actual production

reported from non-exempt permit holders from 2009 through 2023. A summary (**Figures 12** and **13**, pages 34-35) was provided to the District's Board of Directors during the annual report presentation. Special attention should be given to the following data:

During 2023, 99 new wells were registered within the District boundary. 97 of them are exempt wells. Using 330 gallons per day, calculations show that 36 acre-ft/year will be produced on average from the newly added 97 exempt wells. The total exempt use for domestic and agriculture use during 2023 was estimated to be 3,895 acre-ft.

The total permitted "non-exempt" use during 2023 is 3,905 acre-feet, which includes an estimated 100 acre-feet of non-permitted non-exempt use. The sum of "non-exempt use" (3,905 acre-feet) and "exempt use" (3,895 acre-feet) allocated as of end of 2023 is 7,800 acre-feet. Actual 2023 non-exempt production reported to the District totaled 2,191 acre-feet.

Extrapolating a linear trend based on the previous 5-years of data, permitted plus exempt use will exceed the MAG (9,098 acre-feet per year) in 2033 (**Figure 11**).

The Texas Water Development Board set the Hays Trinity Groundwater Conservation District's total MAG (Modeled Available Groundwater) at 9,098 acre-feet. As of 2023, the District has committed 7,800 acre-feet. The remaining 1,298 acre-feet must be distributed between future new exempt and non-exempt commitments.

HTGCD-Trinity Aquifer Management as of December 31, 2023 (Acre-Feet/Year, AFY)

Year-End	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Modeled Available Groundwater [1]		**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,109**	**9,098**	**9,098**	**9,098**	**9,098**
Exempt Use: Domestic/Agricultural	[2]3,300	3,322	3,358	3,398	3,448	3,495	3,542	3,577	3,616	3,663	3,716	3,758	3,809	3,859	**3,895**
Non-Exempt Use: Permitted[3]	1,860	1,877	2,442	2,451	2,854	2,989	3,310	3326	3,545	3,741	3,903	3,924	3,931	3,574	**3,805**
Non-Exempt Use: No Permit -Estimated[4]	100	100	100	100	100	100	100	100	100	100	100	100	100	100	**100**
Non-Exempt Use: Reporting - No Permit[5]	482	364	306	235	19	2	3	4	0	0	0	0	0	0	**0**
Sub-Total Committed	5,742	5,663	6,206	6,184	6,421	6,586	6,955	7,007	7,261	7,504	7,719	7,782	7,840	7,533	**7,700**
Net Available Groundwater (MAG-Sub-Total)		3,446	2,903	2,926	2,688	2,523	2,154	2,102	1,848	1,605	1,390	1,316	1,258	1,565	**1,398**
Non-Exempt Actual Production	1,987	1,796	2,004	1,691	1,599	1,532	1,537	1,586	1,815	1,904	1,940	2,231	2,049	2,523	**2,291**

2009 : 99 new Well Construction Notifications or 37AFY
2010 : 59 new Well Construction Notifications or 22 AFY
2011 : 96 new Well Construction Notifications or 36 AFY
2012 : 107 new Well Construction Notifications or 40 AFY
2013 : 135 new Well Construction Notifications or 50 AFY
2014 : 126 new Well Construction Notifications or 47 AFY
2015 : 127 new Well Construction Notifications or 47 AFY
2016 : 95 new Well Construction Notifications or 35 AFY
2017 : 105 new Well Construction Notifications or 39 AFY
2018 : 126 new Well Construction Notifications or 47 AFY
2019 : 144 new Well Construction Notifications or 53 AFY
2020 : 115 new Well Construction Notifications or 42 AFY
2021 : 137 new Well Construction Notifications or 51 AFY
2022 : 127 new Well Construction Notifications or 47 AFY
2023 : 99 new Well Construction Notifications or 43 AFY

[1] TWDB-calculated MAG pumping decreases over time, and incorporates assumptions on future use
[2] Approved by the HTGCD Board April 25, 2011 based on the HDR NA Case 5,784 (Water-Wastewater Plan for Hays Co., 2011)
[3] Total AFY permitted for pumping in existing operational permits
[4] Non-Exempt Use: not permitted and not reporting; Goal: permit users and move 100 AFY towards 0 AFY*)
*)10 AFY calculated: Identified & Under Investigation = 50 cases @ 2 AFY each = 100 AFY
[5] Non-Exempt Use: reporting but not permitted; Goal: permit users and move 4 AFY towards 0 AFY

Numbers at a Glance

Total Registered Wells:	3,750
Total Utility Connections:	4,670
Total Volume permitted (estimated):	3,805
Total non-exempt produced, AFY:	2,291
Total exempt use (estimated, AFY):	3,898
Total produced (estimated, AFY):	6,186
Total Modeled Available Groundwate	9,098

Table 1: Modeled Available Groundwater in the Trinity Aquifer System within the Hays Trinity GCD Jurisdiction.

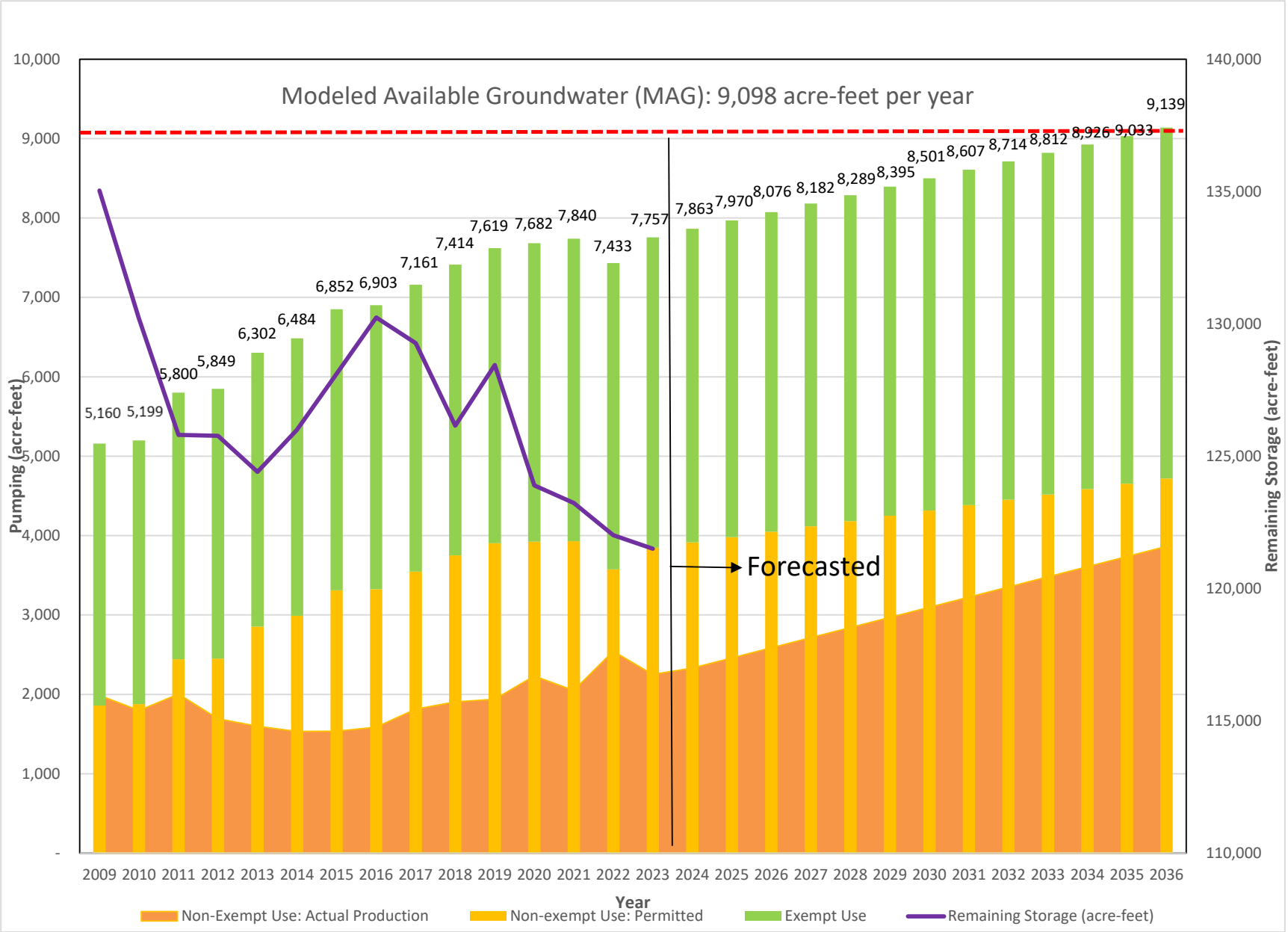


Figure 11: Estimated Exempt and Non-exempt Historical Groundwater Use. The Forecast is a Linear Extrapolation of the 2014-2023 Data in **Table 1**.

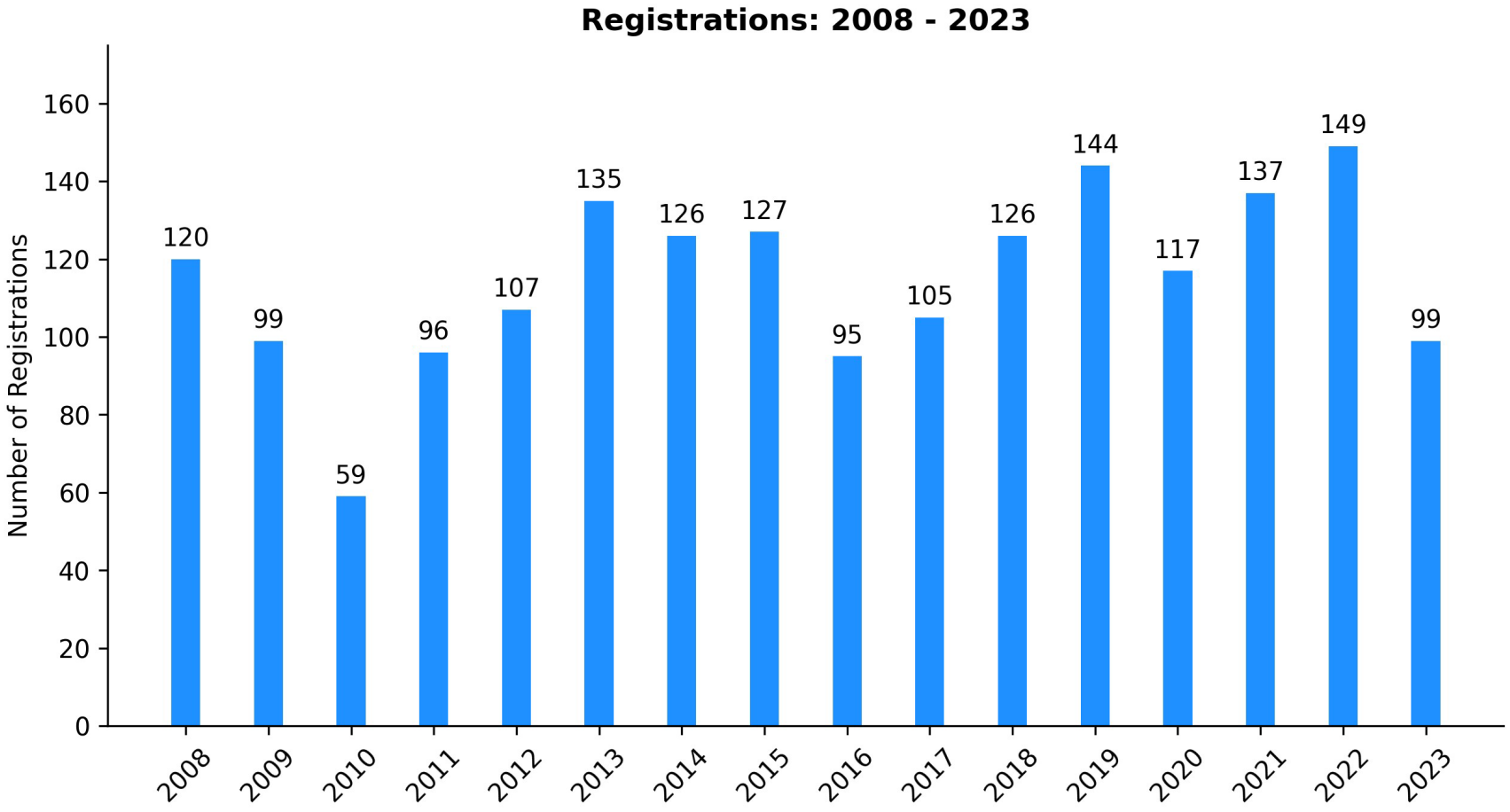

Registrations: 2008 - 2023
Number of Registrations
0
20
40
60
80
100
120
140
160
120
99
59
96
107
135
126
127
95
105
126
144
117
137
149
99
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023

Figure 12: Wells Drilled by Year, Including Geothermal and Non-producing Monitoring Wells

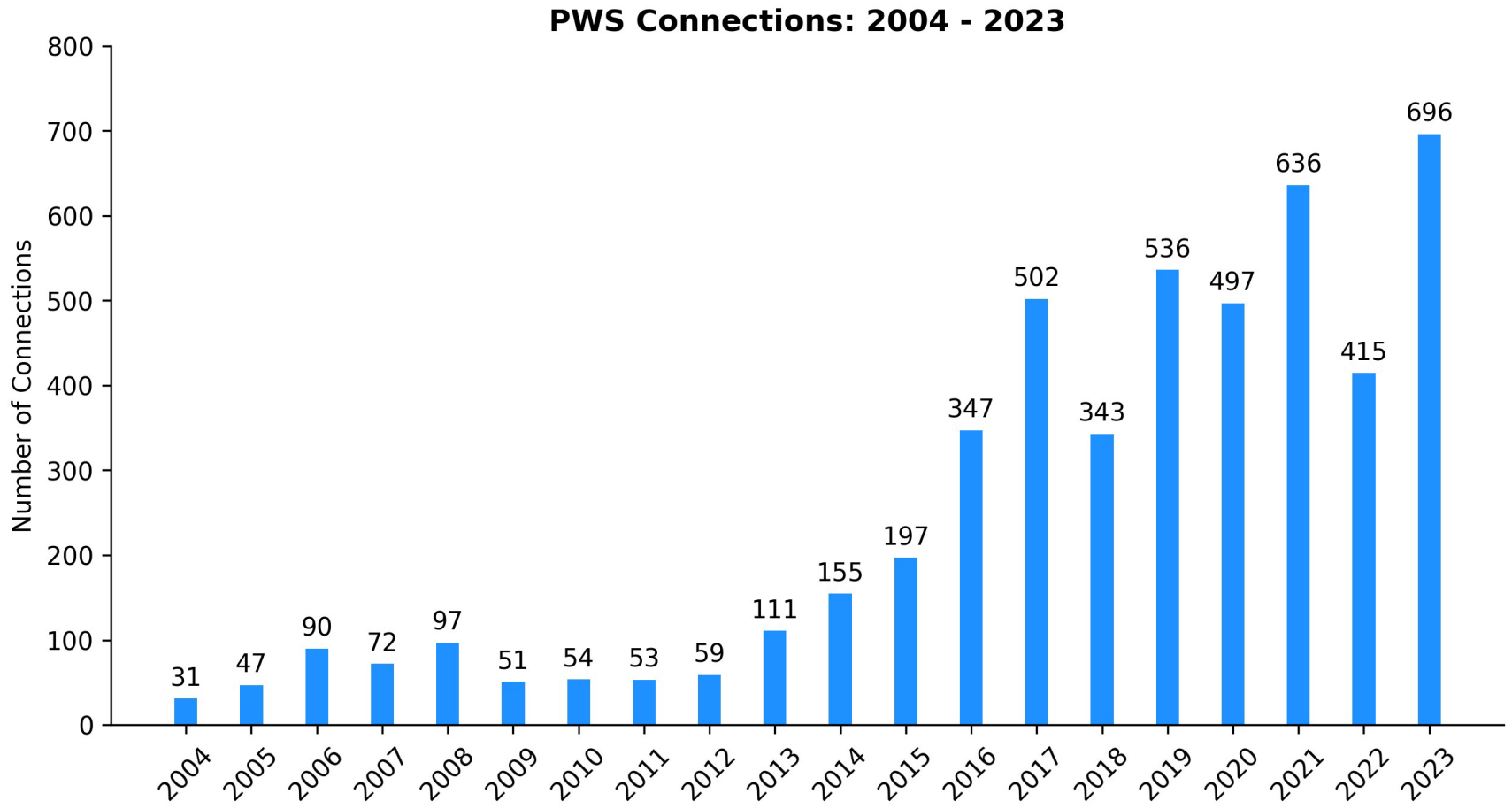


Figure 13. Public Water Supply Connections by Year.

Appendix:

Section 1.	Board Meeting and Public Hearing Agendas
Section 2.	Manager, Science, New Wells & Connections Reports
Section 3.	Drought Support Documents, Orders, Resolutions
Section 4.	Financial Statement, Mitigation Fund, 2021 Audit Summary
Section 5.	Project Reports
Section 6.	Rainwater Harvesting Support Documents
Section 7.	Newspaper Articles and Press Releases
Section 8.	Review of Professional Services √

(Update)

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