

# **Groundwater Management Area 7**

## **Agenda Item 9 – Presentation on the Edwards-Trinity (Plateau) Aquifer Desired Future Condition for Kinney County**

*Presentation on behalf of the Kinney County Groundwater Conservation District*

Vince Clause, PG, GISP

Freese and Nichols, Groundwater Business Lead

March 18<sup>th</sup>, 2026, 10:30 AM – Sutton County Civic Center



# Kinney County GMA 7 DFC Through Time

- **Based on Scenario 3**  
(TWDB GAM Task 10-027)
- **56 annual stress periods**  
with annual withdrawal of  
**77,000 acre-feet / year**
- **Average simulated end-of-**  
**year flow 23.9 cfs**
- **Median simulated end-of-**  
**year flow 24.4 cfs**

## 2011 Planning Cycle

*“In Kinney County, that drawdown which is consistent with maintaining, at Los Moras Springs [sic], an annual **average** flow of **23.9 cfs** and a **median** flow of **24.4 cfs based on Scenario 3** of the Texas Water Development Board’s flow model presented on July 27, 2010...”*

## 2016 Planning Cycle

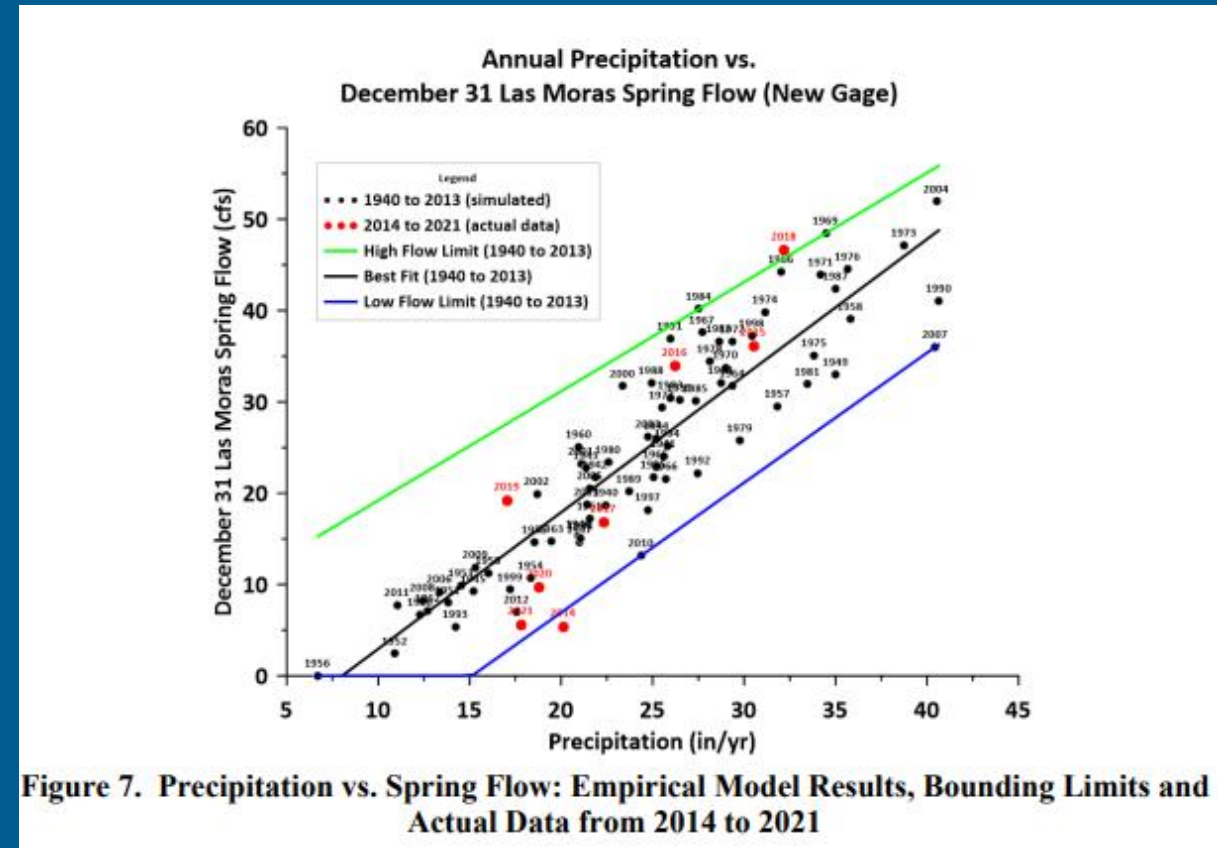
*“Total net drawdown in Kinney County in 2070, as compared with 2010 aquifer levels, shall be consistent with maintenance of annual average flow of 23.9 cfs and an annual median flow of 24.4 cfs at Las Moras Springs (Reference: **Groundwater Flow Model of the Kinney County Area by W.R. Hutchison, Ph.D., P.E., P.G., Jerry Shi, Ph.D. and Marious Jigmond, TWDB, dated August 26, 2011.**”*

## 2021 Planning Cycle

*“Total net drawdown in Kinney County in 2070, as compared with 2010 aquifer levels, shall be consistent with maintenance of an annual **average** flow of **23.9 cfs** and an annual **median** flow of **23.9 cfs** at Las Moras Springs (Reference: **Groundwater Flow Model of the Kinney County Area by W.R. Hutchison, Ph.D., P.E., P.G., Jerry Shi, Ph. D and Marious Jigmond, TWDB, dated August 26, 2011.**”*

# Local Management Challenges

1. Reduced clarity in the linkage between the DFC and underlying modeling scenario
2. The DFC is tied explicitly to annual end-of-year conditions in the model
3. Disconnect between MAG and pumping in Kinney County
4. Confusion and stakeholder discontent regarding annual DFC attainment review process



*Analytical approach for assessing consistency with the Desired Future Condition in GMA 7*

Source: Kinney County Management Plan (2023)

# Summary of Discussion and Board Actions (Aug. 2025 to Present)

## August 25, 2025, Board Meeting

- Directed Freese and Nichols, Inc. (FNI) to evaluate alternative approaches for determining MAG in GMA 7 in support of the 2026 joint planning cycle.

## December 16, 2025, Board Meeting

- FNI presented two (2) potential options grounded in best available data, science, and policy.
  1. Use a statistics driven approach to support a revised MAG. Under this proposed framework and a conditional probability analysis MAG settles ~6,000 ac-ft/year.
  2. Consider the Edwards-Trinity as Non-Relevant for joint planning purposes.
- The KCGCD Board elected to proceed with neither approach and requested that FNI return for further direction at a special meeting.

## January 5, 2026, Special Meeting

- The KCGCD Board directed FNI to shift focus from evaluating alternative MAG formulations under the existing DFC and instead explore alternative DFC frameworks for the Edwards-Trinity (Plateau) Aquifer in the GMA 7 portion of Kinney County.

# Summary of Discussion and Board Actions (Cont.)

## January 27, 2026, Board Meeting

- FNI provide the KCGCD Board with four (4) candidate DFC frameworks.
- The KCGCD Board requested that FNI further explore a one-tier and two-tier Las Moras Spring discharge-based DFC framework.

## February 24, 2026, Board Meeting

- FNI presented an Excel-based calculator to demonstrate how hypothetical DFCs would have performed given historical data.
- The KCGCD Board considered numerous options for their DFC statement and ultimately called for a special meeting to further explore and evaluate potential DFC formulations.

## March 3, 2026, Special Meeting

- The KCGCD Board considered and contemplated how numerous DFC statements would have performed using historical data.
- The KCGCD Board selected a new DFC for the Edwards-Trinity (Plateau) Aquifer in GMA 7.

# KCGCD Board Approved DFC

*“Daily mean spring discharge measured at Las Moras Springs shall not be less than 15 cubic feet per second (cfs) when averaged over 5-years.”*

		One-tier metric, % of time DFC is met from 1940 to 2025									
		# years in averaging window									
		1	2	3	4	5	6	7	8	9	10
cfs	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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	32	12%	6%	6%	6%	7%	7%	5%	3%	3%	3%
	33	10%	6%	6%	6%	7%	4%	1%	1%	1%	1%
	34	8%	6%	5%	5%	4%	1%	1%	1%	0%	0%
	35	6%	5%	5%	5%	1%	0%	0%	0%	0%	0%

# Desired Future Conditions – Nine (9) Factors

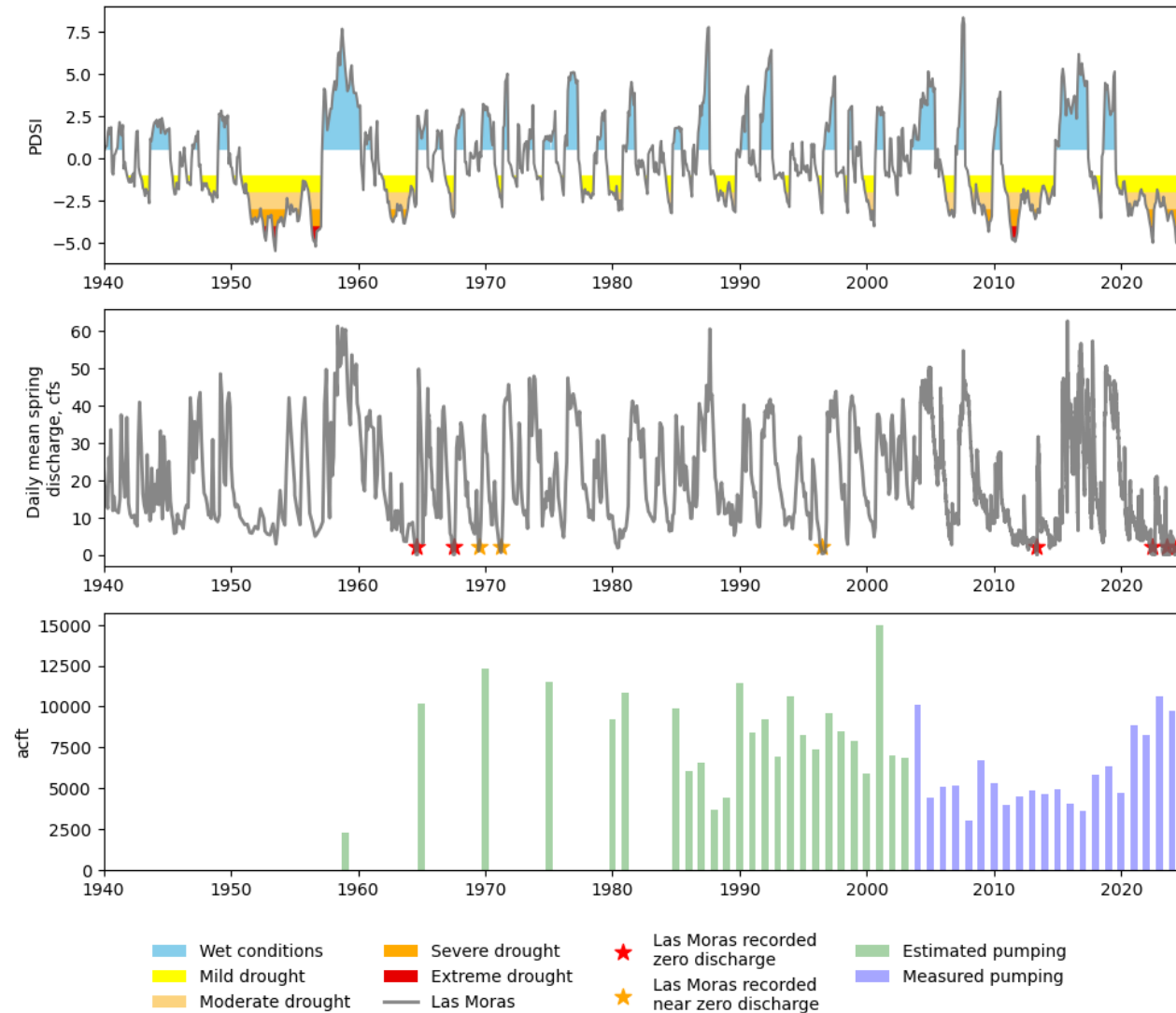
1. “aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another”
2. “the water supply needs and water management strategies included in the state water plan”
3. “hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the executive administrator, and the average annual recharge, inflows, and discharge”
4. “other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water”
5. “the impact on subsidence”
6. “socioeconomic impacts reasonably expected to occur”
7. “the impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Section 36.002”
8. “feasibility of achieving the desired future condition”
9. “any other information relevant to the specific desired future conditions”

# Factor 1:

## *Aquifer Uses or Conditions within the Management Area*

- Spring discharge is a clear local indicator of aquifer health
- Aligns with community values and improves transparency
- Grounded in historical record, reflecting historic aquifer use and climatic conditions
- Kinney County is at the southern end of the Edwards-Trinity (Plateau) Aquifer

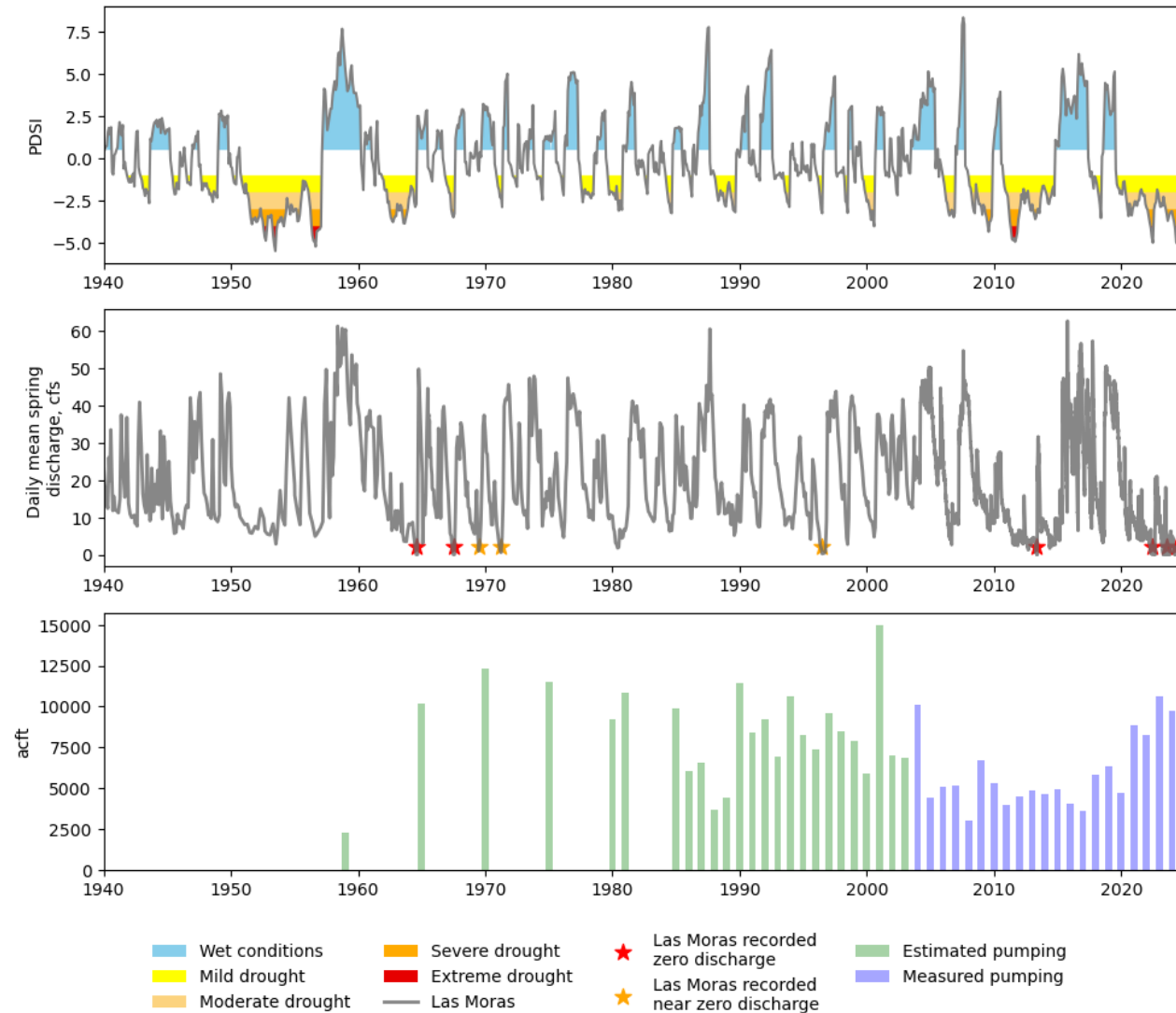
Palmer Drought Severity Index, discharge at Las Moras, and groundwater pumping



# Factor 2: Water Supply Needs and Management Strategies in the State Water Plan

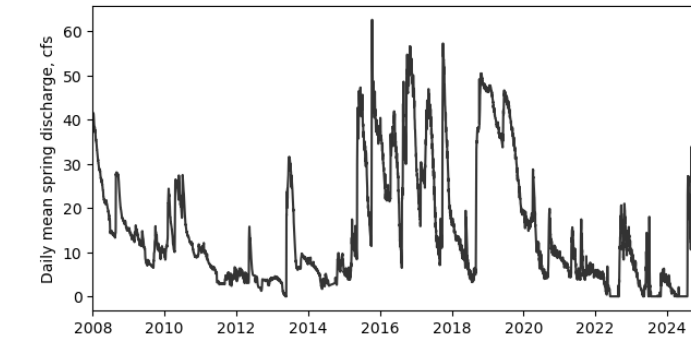
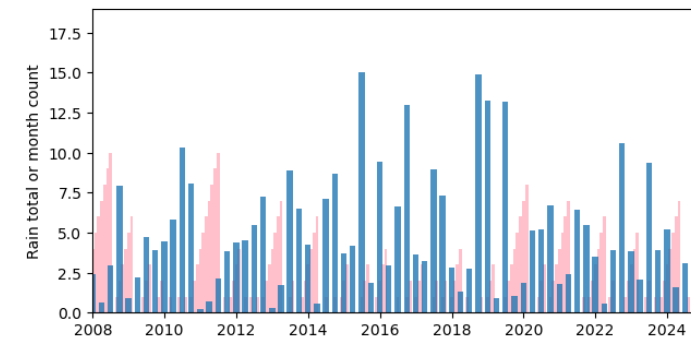
- The existing DFC/MAG framework does not align with observed conditions
- Clearer connection between management goals and planning

Palmer Drought Severity Index, discharge at Las Moras, and groundwater pumping

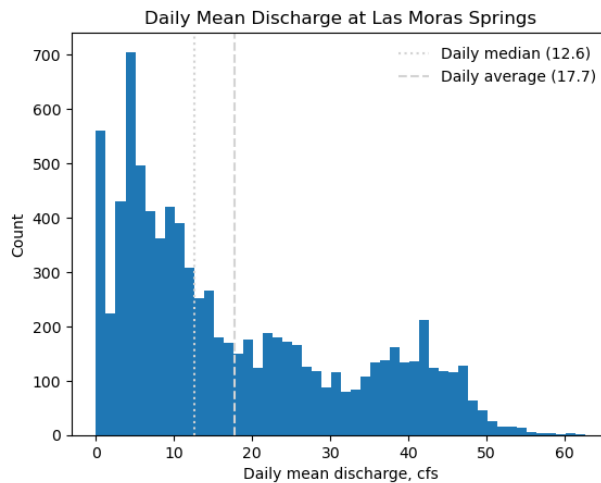


# Factor 3: Hydrological Conditions

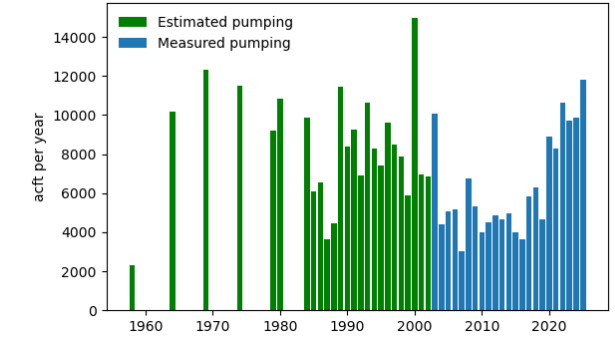
- Evaluation of springflow alongside, precipitation, groundwater pumping records, and drought indices (PDSI)
- Considered springflow from (1900-present)
- Reviewed spring discharge variability through drought periods
- Evaluated precipitation patterns and reviewed multi-year drought stressors
- Pumping records reflect different springflow responses under different climatic conditions



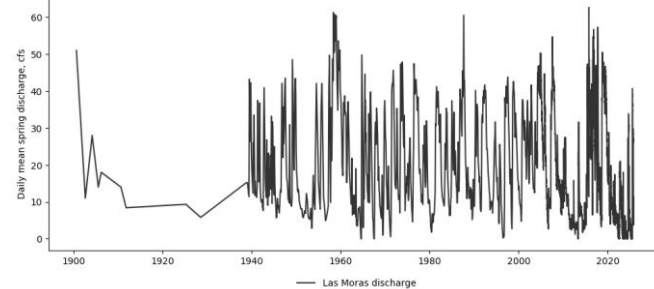
■ # of consecutive months below median precipitation  
■ Quarterly precipitation total, in  
— Las Moras discharge



Measured and estimated groundwater production in Kinney County



Daily Mean Discharge at Las Moras Springs, period of record



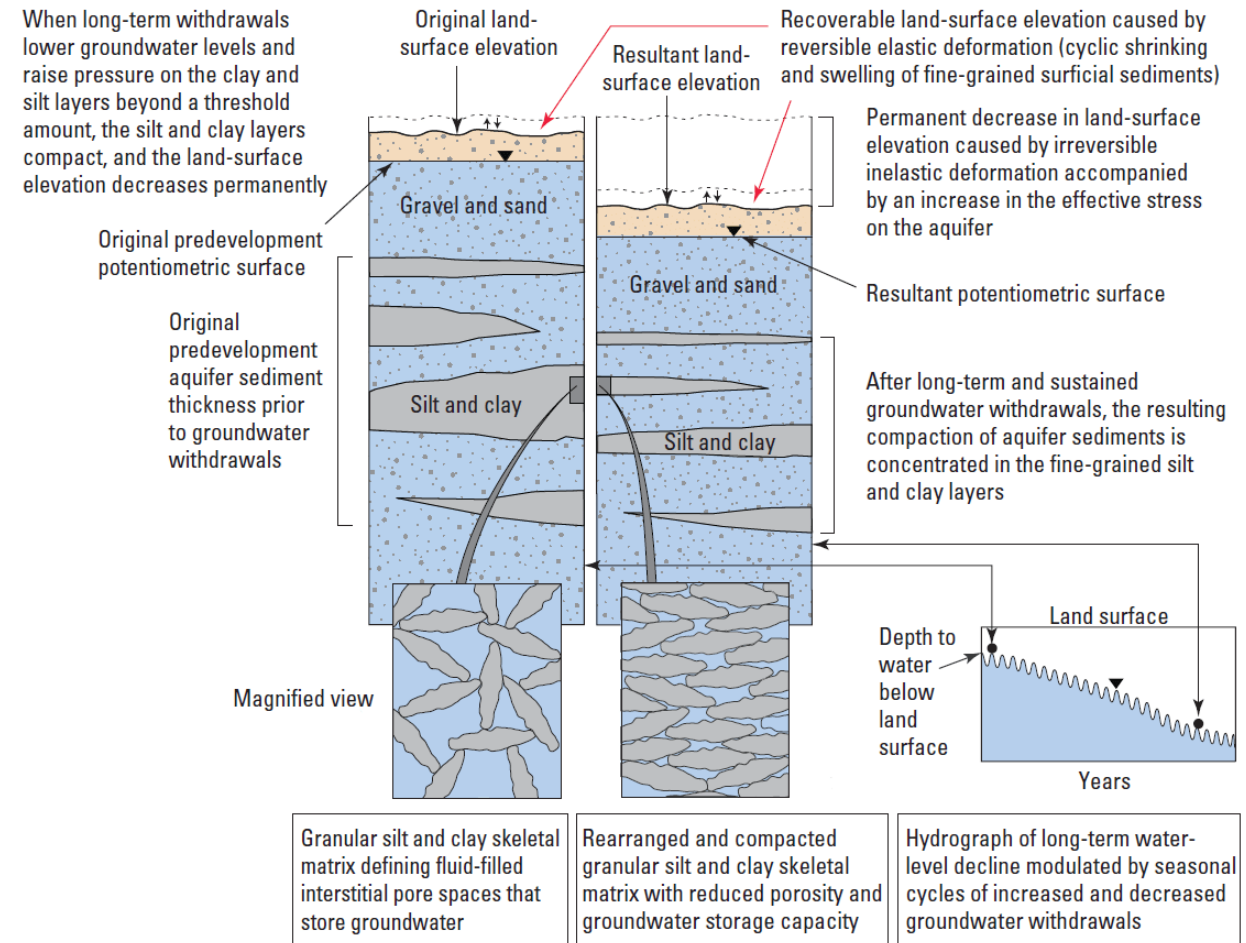
# Factor 4: *Other Environmental Impacts*

- Direct GW-SW linkage and environmental objective
- Averaging approach reflects natural variability, reduces sensitivity to brief seasonal lows while emphasizing sustained spring discharge over the long term



# Factor 5: Impact on Subsidence

- In Kinney County and across the Edwards-Trinity (Plateau) Aquifer subsidence is not known to be a geohazard associated with groundwater withdrawal



# Factor 6: Socioeconomic Impacts Reasonably Expected to Occur

- Kinney County is 100% reliant on groundwater, not maintaining current aquifer conditions could lead to costly well impacts
- Through historical data, the Board weighed the risks of an overly stringent vs. overly lenient DFC

One-tier metric, % of time DFC is met from 1940 to 2025

		# years in averaging window									
		1	2	3	4	5	6	7	8	9	10
dfs	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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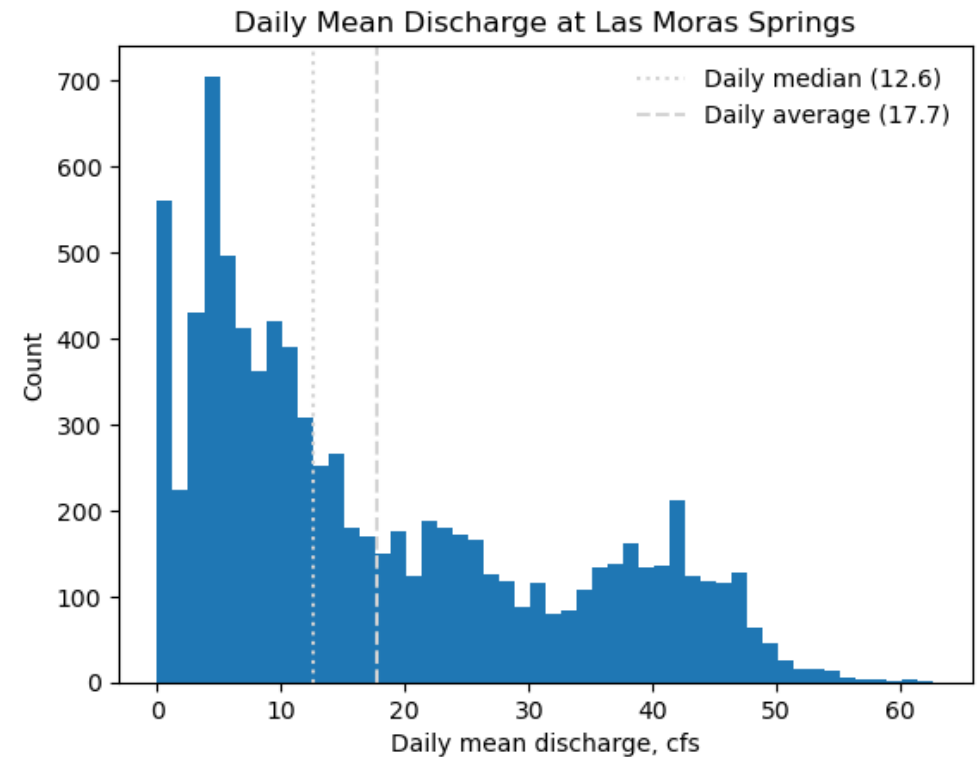
Overly Lenient

Overly Restrictive

# Factor 7:

## *Private Property Interests and Rights*

- Not maintaining current aquifer conditions could lead to decreased property values, and reduced water availability for groundwater-dependent industries such as agriculture
- By selecting a target (15 cfs) that is slightly lower than the average (17.7 cfs) the DFC accommodates for less future recharge without being overly punitive to existing water users



# Factor 8:

## *Feasibility of Achieving the DFC*

- At the March 3, 2026, meeting, the Board emphasized feasibility by testing candidate DFC statements against historical data, seeking a threshold that balances average and drought conditions
- The Board discussed that meeting the DFC will require management plan actions



**March 3, 2026 Special Meeting, Kinney County GCD**

Source: Las Moras Springs Conservation Association

# Factor 9: Any Other Relevant Information

## How did we get here?

- The history of confusion created by evolving DFC wording and the desire to improve interpretability and transparency
- Ongoing and persistent drought
- Community engagement and stakeholder input emphasizing the importance of Las Moras Springs as a focal management objective



## DRAFT TECHNICAL MEMORANDUM



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<b>TO:</b>	Kinney County Groundwater Conservation District, Board of Directors
<b>FROM:</b>	Vince Clause, PG, Freese and Nichols, Inc.
<b>SUBJECT:</b>	Support for Adoption of a Revised Desired Future Condition for the Edwards-Trinity (Plateau) Aquifer, in GMA 7, in Kinney County, Texas.
<b>PROJECT:</b>	KGD25636 – FY26 Hydrogeological Consulting Services
<b>DATE:</b>	March 17, 2026

DRAFT
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF <u>VINCE CLAUSE, P.G.</u> , TEXAS NO. <u>15512</u> ON <u>3/17/2026</u> . IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES. FREESE AND NICHOLS, INC. TEXAS REGISTERED GEOSCIENCE FIRM F- 50655

### 1.00 INTRODUCTION

Freese and Nichols, Inc. (FNI) has prepared this technical memorandum for the Kinney County Groundwater Conservation District (KCGCD) to support continued use of best available science in the Groundwater Management Area 7 (GMA 7) joint planning process. This memorandum summarizes work completed to date that supported the KCGCD Board's adoption of a new Desired Future Condition (DFC) for the Edwards-Trinity (Plateau) Aquifer on March 3, 2026.

This work was completed under FY26 Hydrogeological Consulting Services, Task 2: Support Desired Future Conditions Joint Planning, authorized on August 23, 2025, under the Master Services Agreement between KCGCD and FNI.

### 2.00 HISTORY OF THE DESIRED FUTURE CONDITIONS STATEMENT FOR THE EDWARDS-TRINITY (PLATEAU) AQUIFER IN GMA 7 IN KINNEY COUNTY

#### 2.01 DFC FORMULATION FOR KINNEY COUNTY

For the GMA 7 portion of Kinney County, the DFC for the Edwards-Trinity (Plateau) Aquifer is expressed in terms of Las Moras Springs discharge as simulated under Scenario 3 of the Texas Water Development Board's (TWDB) Draft Groundwater Availability Model (GAM) Task 10-027, (revised; Hutchison, 2011), which is based on the Groundwater Flow model of the Kinney County Area (Hutchison and others, 2011). Under this framework, the aquifer system is simulated over 56 annual stress periods with a constant annual withdrawal of 77,000 acre-feet per year from the Edwards-Trinity (Plateau) Aquifer.

Based on the predictive simulation results, TWDB reported average and median end-of-year simulated discharge at Las Moras Springs. These statistics were subsequently adopted as the DFC for Kinney County, as follows:

- ▲ • Average simulated end-of-year-spring flow: 23.9 cubic feet per second (cfs)
- Median simulated end-of-year-spring flow: 24.4 cfs

# Thank you

Vince Clause, PG | [vince.clause@freese.com](mailto:vince.clause@freese.com)

