GMA 12

Aquifer Uses and Conditions Consideration Discussion

by

GMA 12 Consultant Team

TWC Section 36.108 (d)

- Before voting on the proposed desired future conditions ŭ the districts shall consider:
  - **Aquifer uses and conditions**
  - Needs and strategies
  - Hydrologic conditions
  - Environmental impacts
  - Subsidence
  - Socioeconomic impacts
  - Private property rights
  - Feasibility
  - Anything else

TWC Section 36.108 (d-2)

- The desired future conditions ŭ must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater ŭ in the management area.

Consideration 1

- Aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another.

Aquifers

- Carrizo-Wilcox (including Carrizo, Calvert Bluff, Simsboro, and Hooper)
- Queen City
- Sparta
- Yegua-Jackson
- Brazos River Alluvium
- Trinity

Aquifer Uses

- Includes the following per TWDB:
  - **Muncipal**- city-owned, districts, WSCs, or private utilities supplying residential, commercial (non-goods-producing businesses), and institutional, and non-surveyed municipal (rural domestic)
  - **Manufacturing**- process water use reported by large manufacturing plants
  - **Livestock**
  - **Irrigation**
  - **Mining**- includes water used in the mining of oil, gas, coal, sand, gravel, and other materials
  - **Steam-Electric**- consumptive use of water by large power generation plants

Estimated Groundwater Use

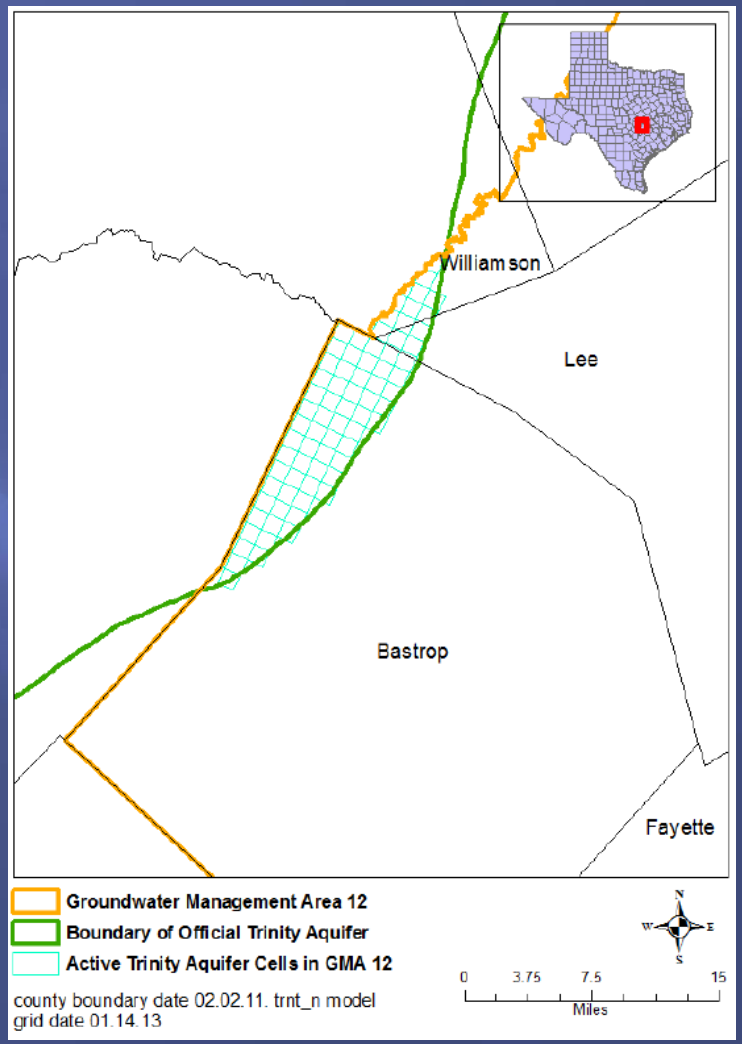
Estimated Historic Water Use Met With Groundwater					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	100%	75%	90%	100%	90%
Livestock	25%	30%	30%	10%	50%
Manufacturing	75%	45%	100%	0%	30%
Mining	100%	95+%	100%	50%	60%
Muncipal	100%	80%	95%	100%	100%
Steam-Electric Power	0%	0%	30%	0%	0%

2012 Reported Production

2012 Metered/ Reported Groundwater Production (acre-feet)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Brazos River Alluvium	NA	17,000	90,814	NA	NA
Yegua-Jackson	0	700	1,707	78	579
Sparta	104	850	3,237	1,374	20
Queen City	110	300	685	417	0
Carrizo	3,444	1,400	810	2,038	0
Calvert Bluff	493	300	364	2,670	NA
Simsboro	16,980	13,000	59,538	1,074	NA
Hooper	0	700	1,086	2,614	NA
Carrizo-Wilcox	*20,917*	*15,400*	*61,798*	*8,397*	*0*
TOTAL	21,131	34,250	158,241	10,265	599

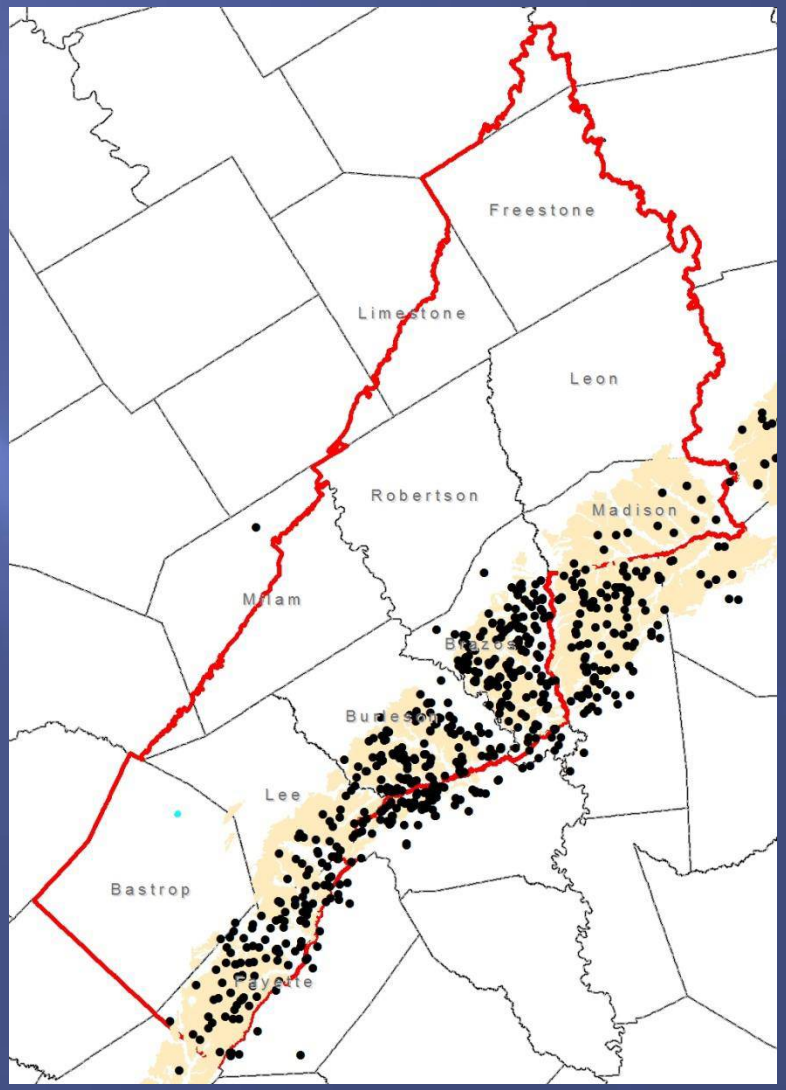
Trinity Aquifer

- Major Aquifer
- Present only in Bastrop, Lee, and Williamson Counties
- No historic use in GMA
- No known wells in GMA
- Very deep in GMA (>3,000 feet)
- Not relevant



Yegua-Jackson Aquifer

- Minor Aquifer
- Present across GMA 12
- Moderate historic use
- Numerous wells
- Wells tend to be shallow
- DFCs in 2010



Well data from TWDB groundwater database

Yegua-Jackson Uses

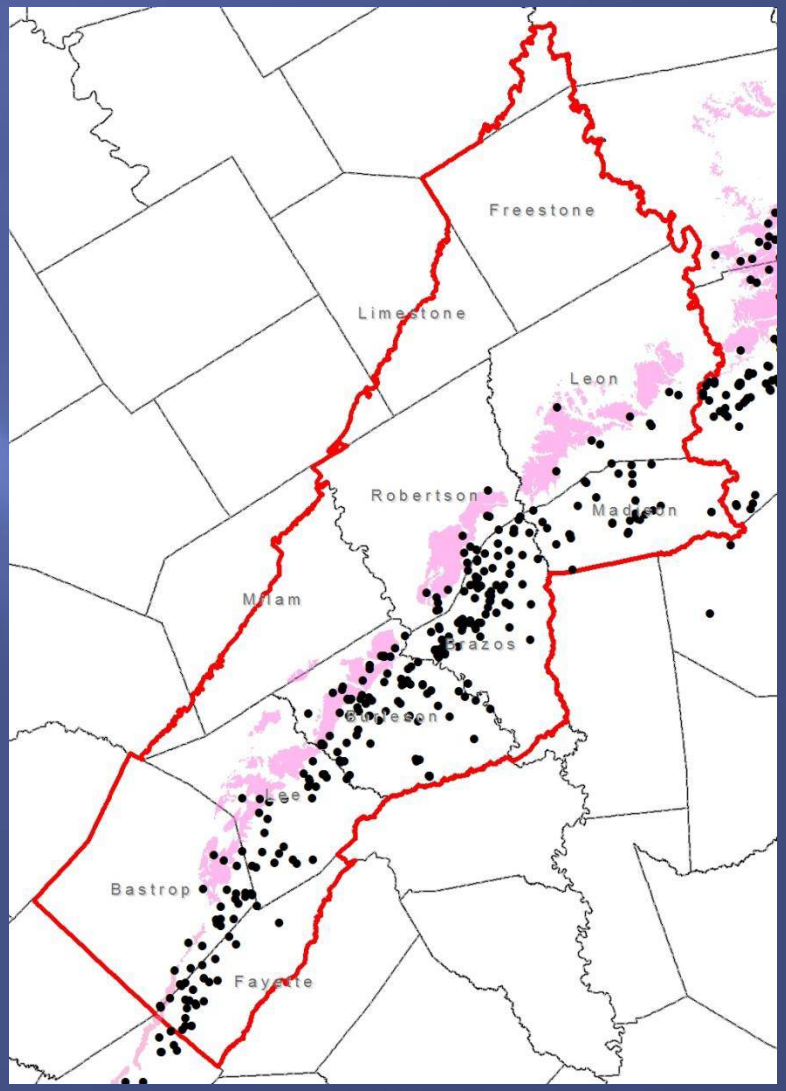
- Groundwater primarily produced from shallow wells
- Groundwater primarily used for domestic, irrigation and livestock purposes
- Some used for municipal, industrial, and oil and gas drilling
- Some significant users:
  - Several municipalities in Fayette County
  - Rig supply in Madison County
  - Golf course irrigation and some industrial use in BVGCD

Yegua-Jackson Uses

Approximate Yegua-Jackson Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	0%	20%	45%	0%	15%
Livestock	50%	10%	10%	5%	10%
Manufacturing	0%	0%	0%	0%	0%
Mining	0%	0%	0%	45%	0%
Muncipal	50%	60%	45%	50%	75%
Steam-Electric Power	0%	0%	<5%	0%	0%

Sparta Aquifer

- Minor Aquifer
- Present across GMA 12
- Low historic use
- Numerous wells
- Wells are shallow to moderately deep
- DFCs in 2010



Well data from TWDB groundwater database

Sparta Uses

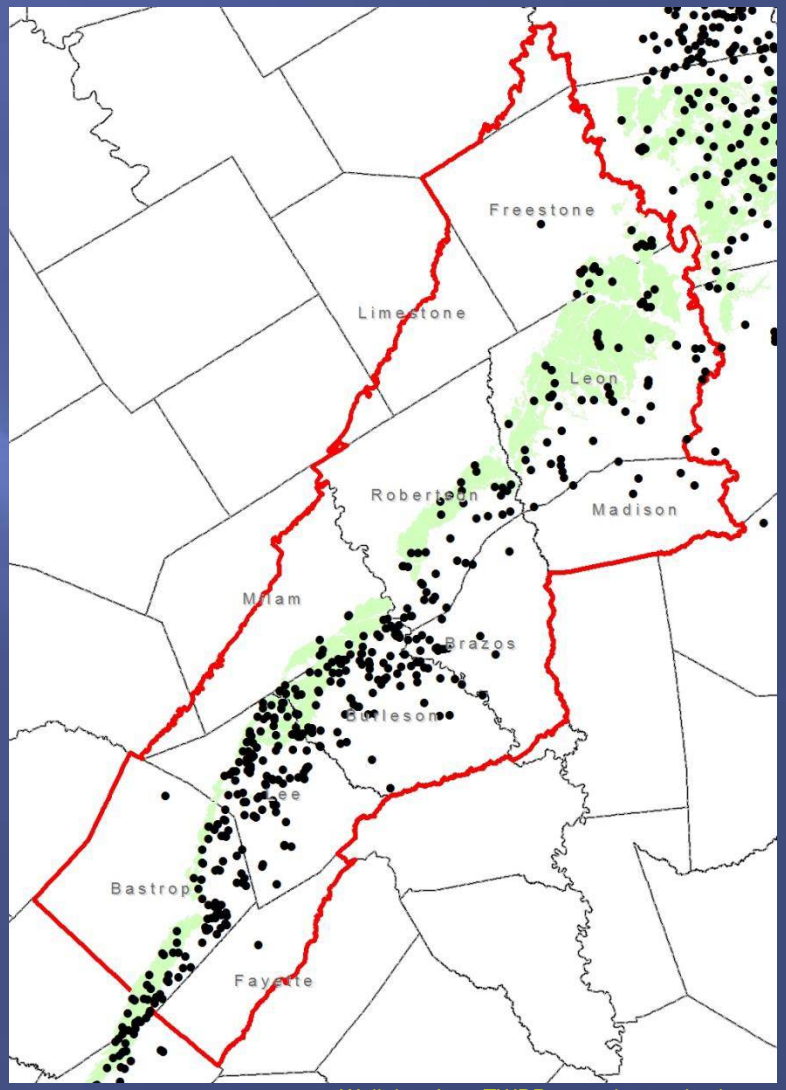
- Groundwater primarily produced from shallow to moderately deep wells (most <1000', a few up to 2,000')
- Groundwater primarily used for municipal, domestic, and livestock
- Some used for industrial, irrigation, and oil and gas well drilling
- Some significant users:
  - City of Madisonville
  - WSCs and municipal use in Brazos, Lee Counties

Sparta Uses

Approximate Sparta Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	45%	40%	10%	<5%	40%
Livestock	10%	5%	5%	<5%	10%
Manufacturing	0%	5%	0%	0%	0%
Mining	0%	0%	0%	0%	0%
Muncipal	45%	40%	80%	95+%	50%
Steam-Electric Power	0%	0%	<5%	0%	0%

Queen City Aquifer

- Minor Aquifer
- Present across GMA 12
- Low to moderate historic use
- Numerous wells
- Wells are shallow to moderately deep
- DFCs in 2010



Well data from TWDB groundwater database

Queen City Uses

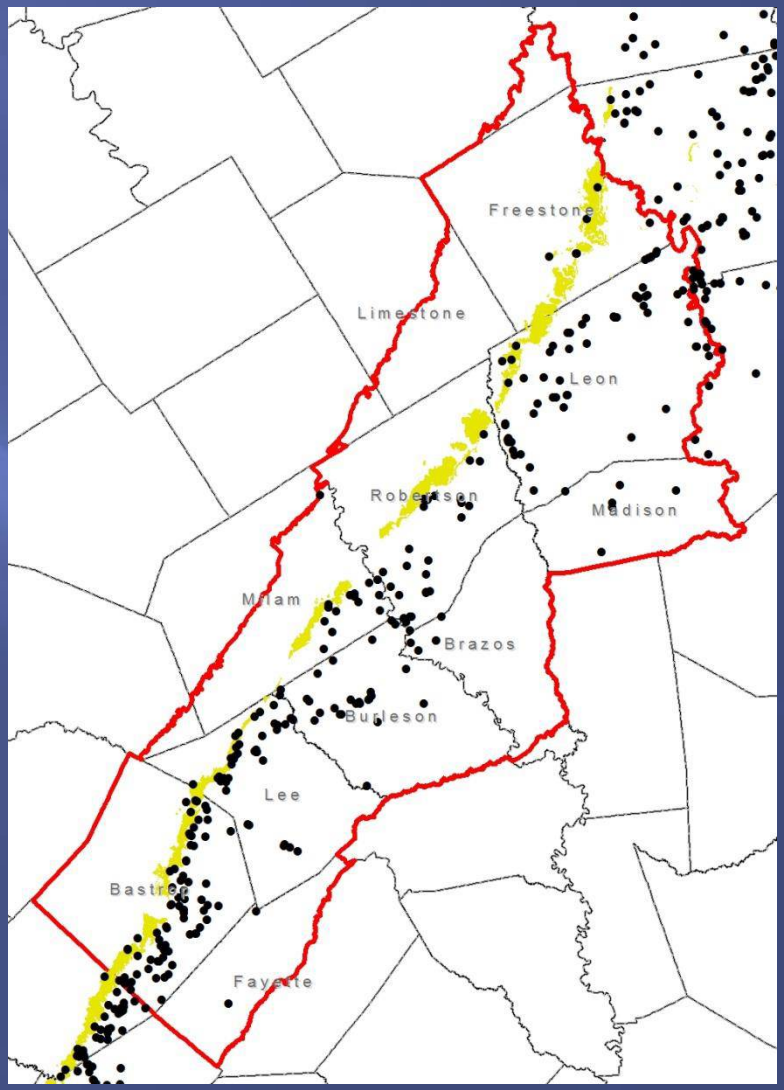
- Groundwater primarily produced from shallow to moderately deep wells (most <1000', a few up to 2,000')
- Groundwater primarily used for irrigation, domestic, and livestock
- Some used for municipal
- Some significant users:
  - Rural WSCs in METGCD
  - Town of Lincoln,
  - Landowners for livestock and domestic purposes

Queen City Uses

Approximate Queen City Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	60%	5%	75%	0%	5%
Livestock	15%	5%	10%	5%	5%
Manufacturing	0%	5%	0%	10%	0%
Mining	0%	0%	0%	0%	0%
Muncipal	25%	70%	15%	85%	90%
Steam-Electric Power	0%	0%	<5%	0%	0%

Carrizo Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across GMA 12
- Moderate historic use
- Moderate number of wells
- Wells can be deep
- DFCs in 2010



Well data from TWDB groundwater database

Carrizo Uses

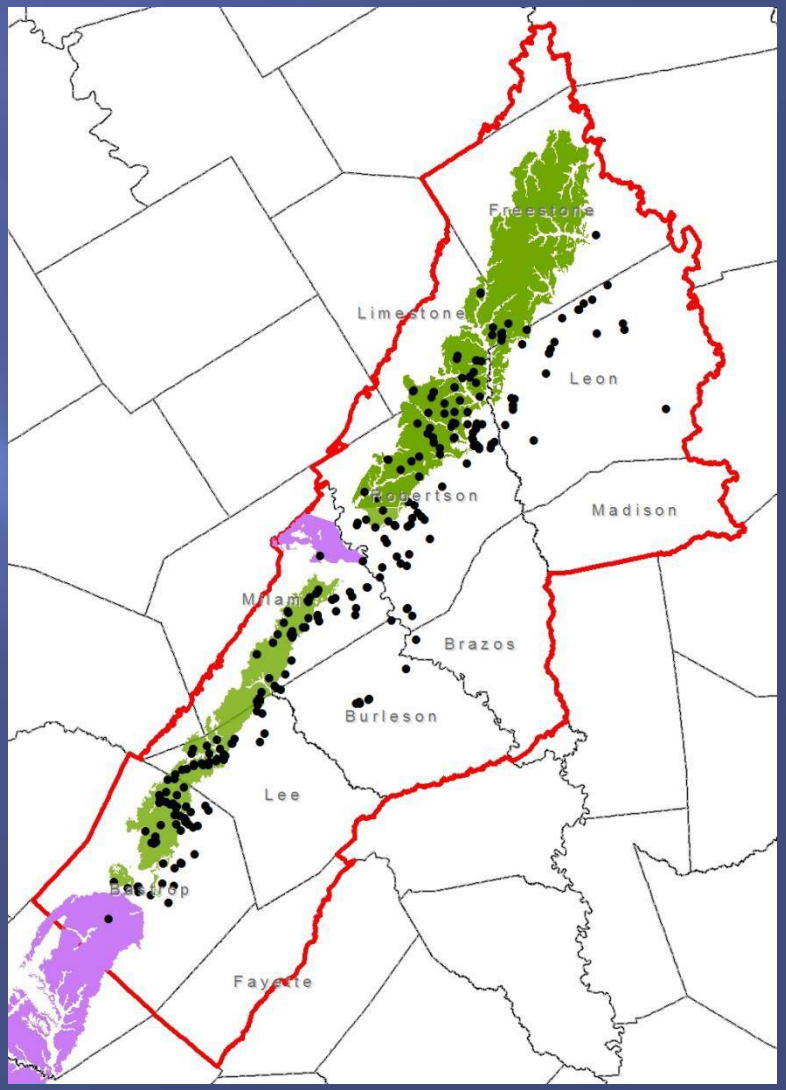
- Wells up to about 2,000 feet in depth
- Groundwater primarily used for municipal, domestic, and livestock
- Some used for irrigation
- Some significant users:
  - Cities of Giddings, Smithville,
  - Aqua WSC, Lee County WSC
  - TDCJFerguson unit (~1350 acft/ yr)
  - Rural WSCs (~300 acft/ yr)
  - Texas A&M University

Carrizo-Wilcox Uses

Approximate Carrizo-Wilcox Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	10%	<5%	25%	10%	95+%
Livestock	<5%	<5%	<5%	5%	0%
Manufacturing	<5%	5%	<5%	10%	0%
Mining	<1%	55%	10%	10%	0%
Muncipal	80-85%	20%	55%	65%	0%*
Steam-Electric Power	0%	0%	5%	0%	0%

Calvert Bluff Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across GMA 12
- Moderate historic use
- Moderate number of wells
- Most wells are shallow
- DFCs in 2010



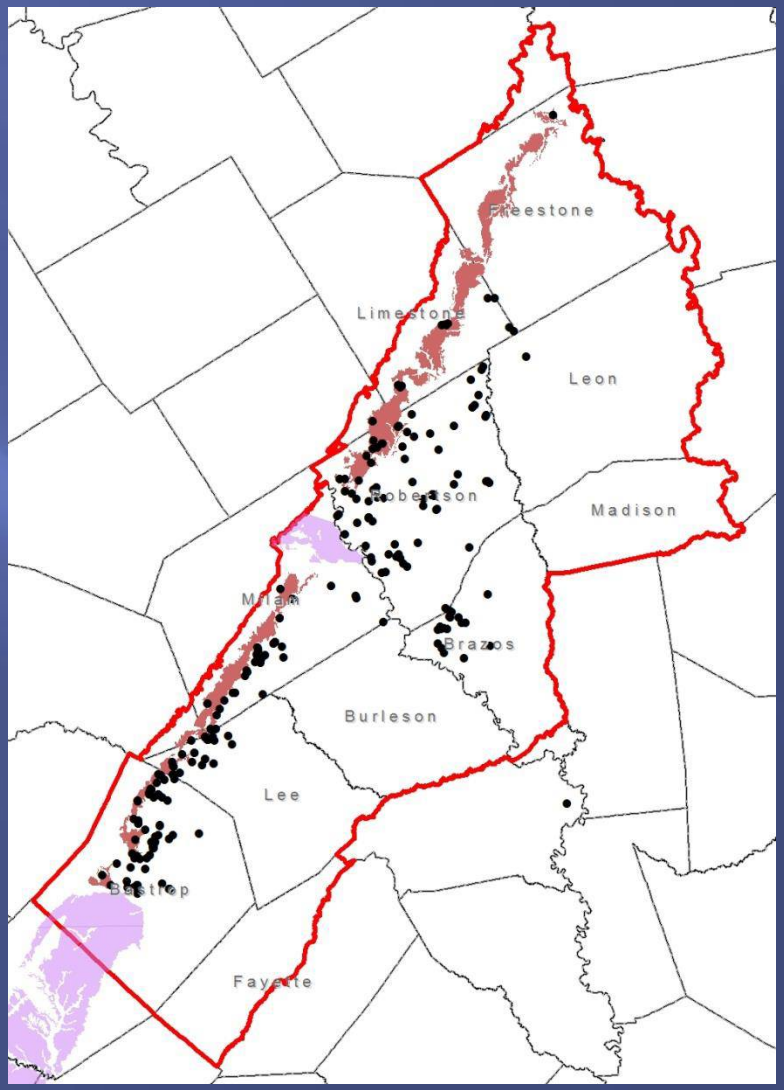
Well data from TWDB groundwater database

Calvert Bluff Uses

- Groundwater mostly produced from shallow wells (<800 feet)
- Groundwater primarily used for livestock and domestic purposes
- Some used for municipal, oil and gas drilling
- Some significant users:
  - Bastrop County WCID#2, numerous METGCD WSCs,
  - Nucor Steel (600 acft/ yr)
  - Land and livestock owners

Simsboro Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across GMA 12
- Significant historic use
- Moderate number of wells
- Wells can be very deep
- DFCs in 2010



Well data from TWDB groundwater database

Simsboro Uses

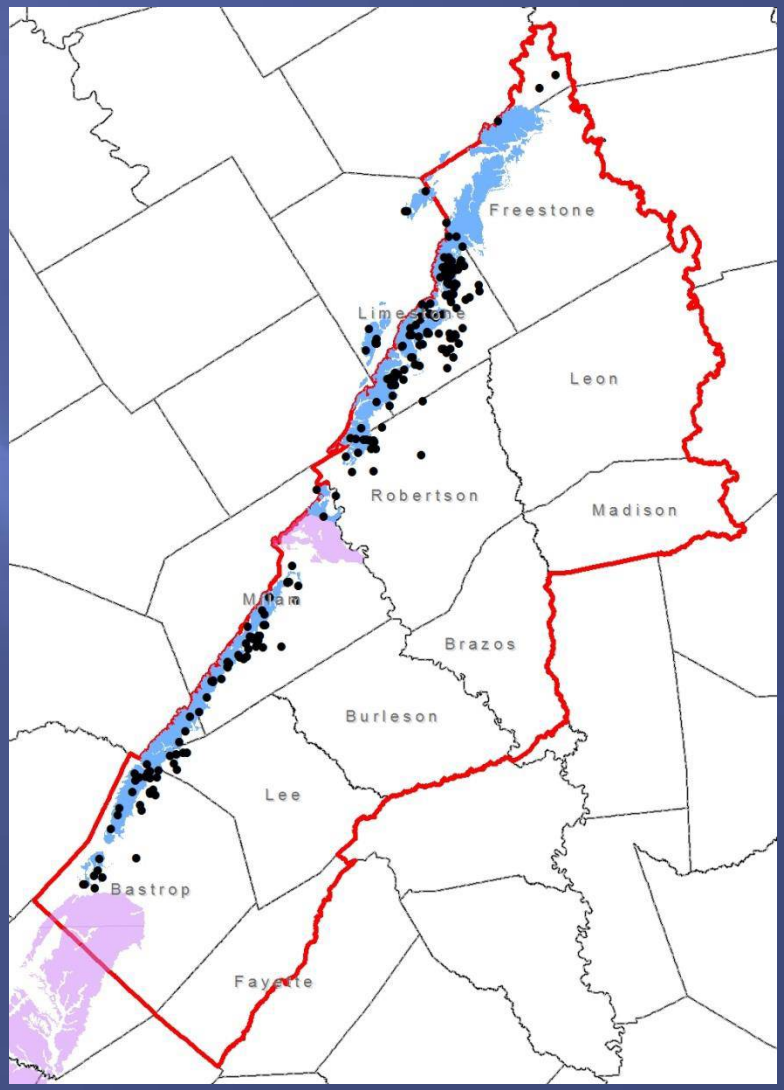
- Groundwater produced from wells up to 3,000 feet deep
- Groundwater primarily used for municipal, and mine depressuring
- Some used for livestock, industrial, and irrigation

Simsboro Uses

- Some significant users:
  - Manville WSC, Aqua WSC, several METGCD WSCs
  - LCRA, Forestar
  - Cities of Bryan/ College Station, Elgin
  - Texas A&M University
  - NRG Texas Power LLC
  - Landowners
  - Two lignite coal mines

Hooper Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across GMA 12
- Low historic use
- Moderate number of wells
- Wells are shallow
- DFCs in 2010



Well data from TWDB groundwater database

Hooper Uses

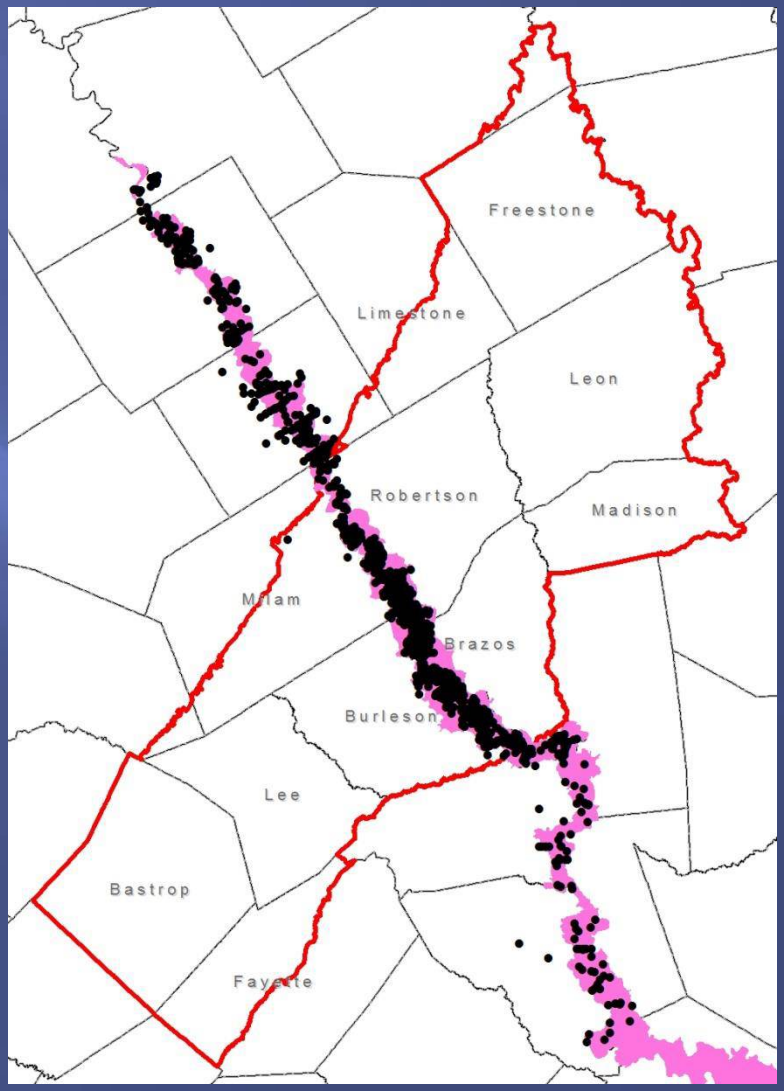
- Groundwater primarily produced from shallow wells- most <500 feet deep
- Groundwater primarily used for domestic and livestock purposes
- Some used for power generation, muncipal purposes
- Some significant users:
  - Cities of Fairfield, Teague,
  - TDCJBoyd Unit
  - City of Bremond in Robertson County

Carrizo-Wilcox Uses

Approximate Carrizo-Wilcox Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	10%	<5%	25%	10%	95+%
Livestock	<5%	<5%	<5%	5%	0%
Manufacturing	<5%	5%	<5%	10%	0%
Mining	<1%	55%	10%	10%	0%
Muncipal	80-85%	20%	55%	65%	0%*
Steam-Electric Power	0%	0%	5%	0%	0%

Brazos River Alluvium Aquifer

- Minor Aquifer
- Localized in GMA 12
- Moderate historic use
- Numerous wells
- Wells are very shallow
- DFCs in 2010



Well data from TWDB groundwater database

Brazos River Alluvium Uses

- Groundwater primarily produced from very shallow wells (<100˙)
- Groundwater primarily almost exclusively used for irrigation in the Brazos River Bottom
  - Crops
    - Corn
    - Cotton
    - Soybeans
    - Hay
    - Grain sorghum
- Small amount of domestic and livestock use

Brazos River Alluvium Uses

Approximate Brazos River Alluvium Historic Groundwater Use (Percent)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
Irrigation	NA	100%	95+%	NA	NA
Livestock	NA	0%	<5%	NA	NA
Manufacturing	NA	0%	0%	NA	NA
Mining	NA	0%	0%	NA	NA
Muncipal	NA	0%	0%	NA	NA
Steam-Electric Power	NA	0%	0%	NA	NA

Summary

- GMA 12 relies heavily on groundwater for all uses
- Over 50% of groundwater used for municipal purposes in most of the GMA (other than Brazos River Alluvium)

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Livestock	25%	30%	30%	10%	50%
Manufacturing	75%	45%	100%	0%	30%
Mining	100%	95+%	100%	50%	60%
Muncipal	100%	80%	95%	100%	100%
Steam-Electric Power	0%	0%	30%	0%	0%

Summary

- In much of the GMA, most groundwater production is from the Carrizo-Wilcox, especially the Simsboro

2012 Metered/ Reported Groundwater Production (acre-feet)					
	Lost Pines GCD	Post Oak Savannah GCD	Brazos Valley GCD	Mid-East Texas GCD	Fayette County GCD
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QUESTIONS?