# GMA 12

# Aquifer Uses and Conditions Consideration Discussion

by

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# TWC Section 36.108 (d)

- Before voting on the proposed desired future conditions … 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 … must provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater … 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
- Gulf Coast

# Aquifer Uses

- Includes the following per TWDB:
  - **Municipal**- 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

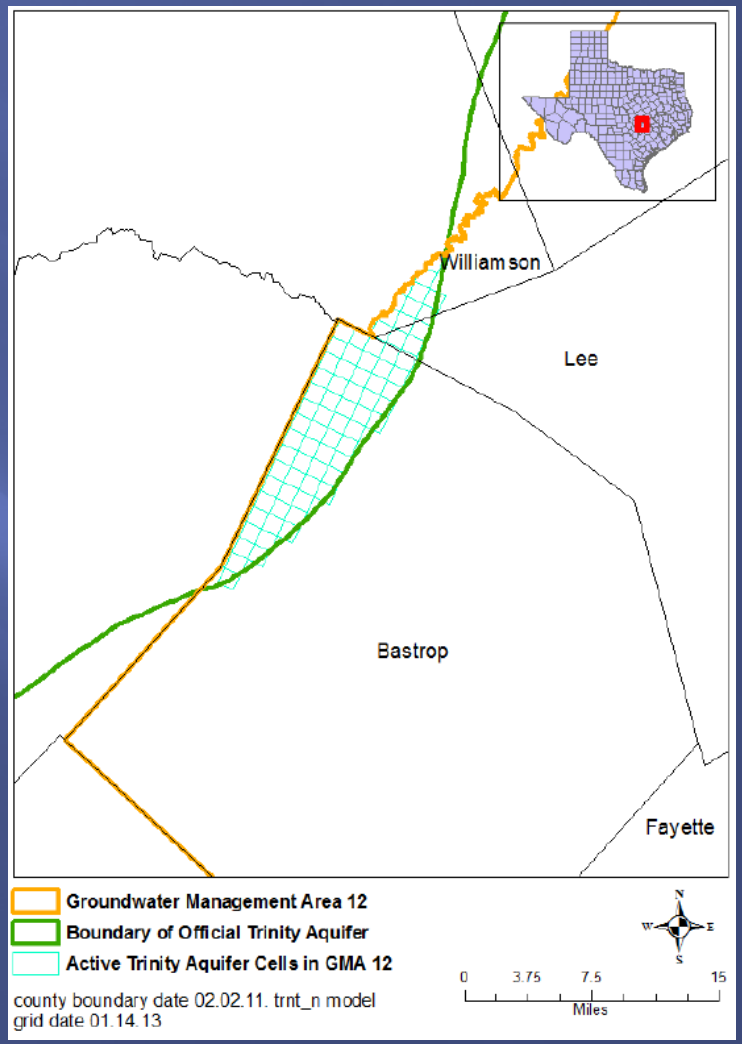
| | Estimated Water Use Met With Groundwater | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 100% | 99% | 90% | 100% | 90% |
| Livestock | 25% | 30% | 20% | 10% | 75% |
| Manufacturing | 100% | 89% | 100% | 0% | 30% |
| Mining | 95+% | 95+% | 80% | 50% | 60% |
| Municipal | 100% | 67% | 95% | 100% | 100% |
| Steam-Electric Power | 75% | 0% | 25% | 0% | 0% |

# 2018 Reported Production

| 2018 Metered/Reported Groundwater Production (acre-feet) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Colorado/Brazos River Alluvium | 1,252 | 9,801 | 142,853 | NA | 55 |
| Yegua-Jackson | 0 | 152 | 1,183 | 9 | 965 |
| Sparta | 225 | 958 | 4,309 | 2,356 | 0 |
| Queen City | 249 | 313 | 118 | 585 | 163 |
| Carrizo | 2,834 | 1,067 | 758 | 1,102 | 166 |
| Calvert Bluff | 1,050 | 412 | 193 | 5,175 | NA |
| Simsboro | 18,704 | 4,932 | 58,297 | 1,213 | NA |
| Hooper | 677 | 361 | 809 | 3,685 | NA |
| *Carrizo-Wilcox* | *23,264* | *6,773* | *60,058* | *11,174* | *0* |
| TOTAL | 24,991 | 17,996 | 208,520 | 14,123 | 1,349 |

# 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

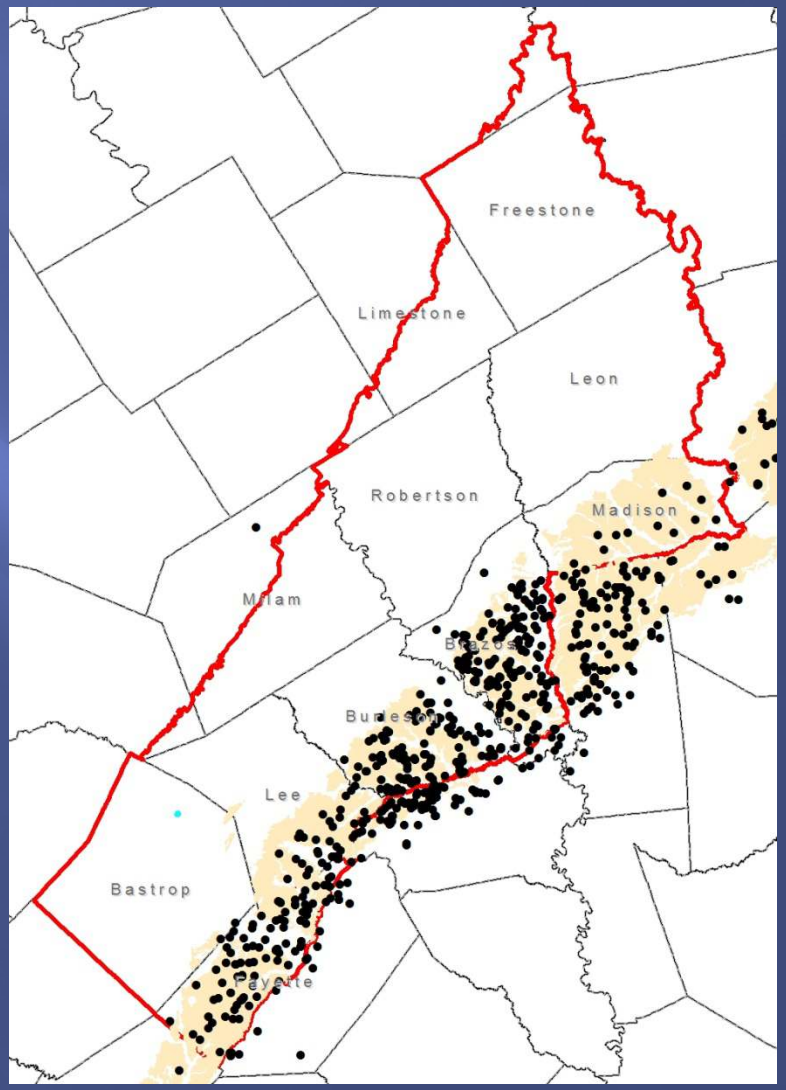


# Gulf Coast Aquifer System

- Major Aquifer
- Present in only the very southern part of Brazos County
- Minor historic use in GMA
- Not relevant

# Yegua-Jackson Aquifer

- Minor Aquifer
- Present across GMA 12
- Moderate historic use
- Numerous wells
- Wells tend to be shallow to moderate depth
- Not relevant in LPGCD
- DFCs in 2016 for other GCDs




Well data from TWDB groundwater database

# Yegua-Jackson Uses

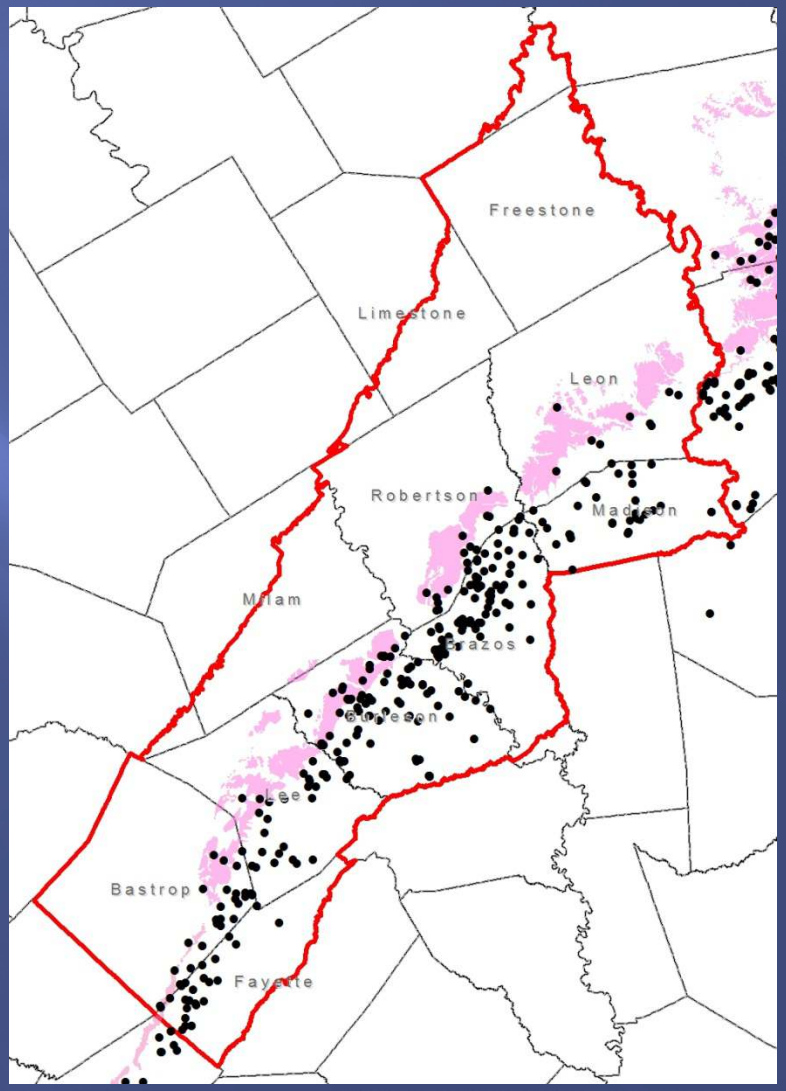
- Groundwater primarily produced from wells less than 600 feet deep
- Groundwater primarily used for domestic, irrigation and livestock purposes
- Some used for municipal, industrial, and oil and gas drilling
- Some significant users:
  - Several municipalities in Fayette County (La Grange, Schulenburg, Flatonia, Fayette WSC, etc.)
  - Past rig supply in Madison County (declining)
  - Golf course irrigation and some industrial use in BVGCD

# 2018 Yegua-Jackson Uses

| Approximate Yegua-Jackson 2018 Groundwater Use (Percent) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 0% | 17% | 20% | 20% | 15% |
| Livestock | 50% | 22% | <5% | 20% | 10% |
| Manufacturing | 0% | 0% | 25% | 0% | 0% |
| Mining | 0% | 0% | <5% | 40% | 0% |
| Municipal | 50% | 61% | 55% | 20% | 75% |
| Steam-Electric Power | 0% | 0% | 0% | 0% | 0% |

# Sparta Aquifer

- Minor Aquifer
- Present across GMA 12
- Limited historic use
- Numerous wells
- Wells are shallow to moderately deep
- DFCs in 2016




Well data from TWDB groundwater database

# Sparta Uses

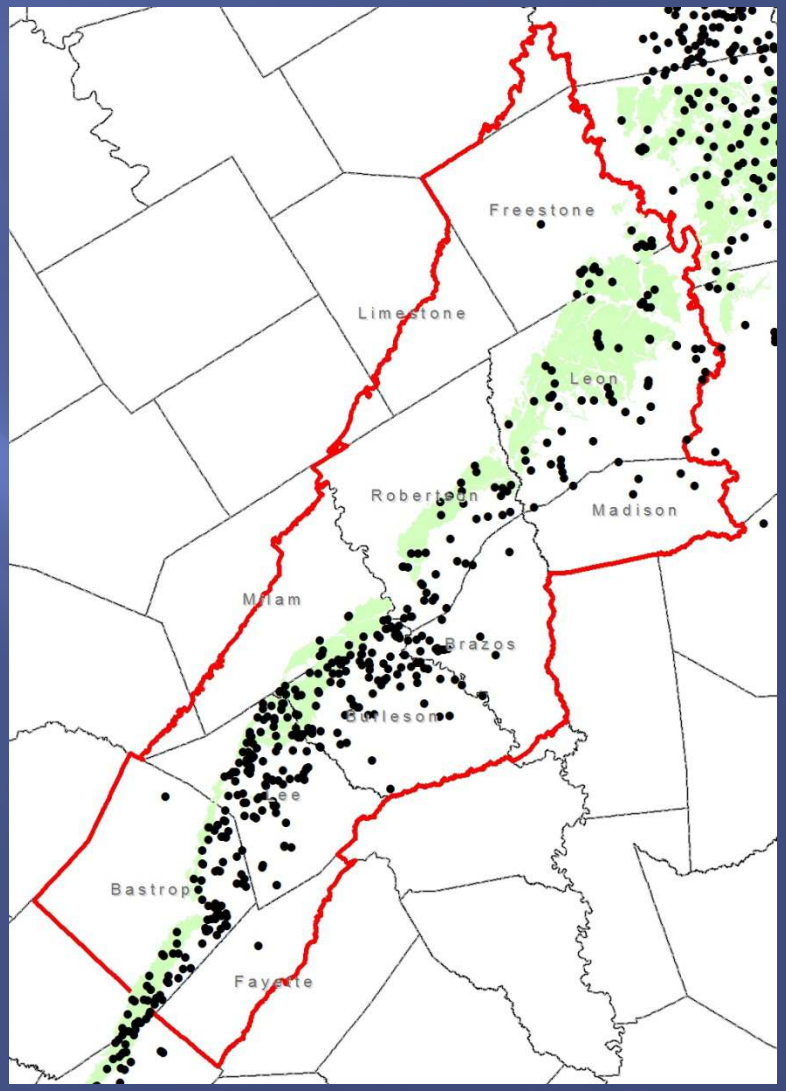
- Groundwater primarily produced from shallow to moderately deep wells (most less than 1000 feet, a few up to 2,000 feet deep)
- Groundwater primarily used for municipal, domestic, and livestock
- Some used for industrial, irrigation, and oil and gas well drilling
- Some significant users:
  - City of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

# 2018 Sparta Uses

| Approximate Sparta 2018 Groundwater Use (Percent) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 45% | 0% | 15% | <5% | 40% |
| Livestock | 10% | 8% | 5% | <5% | 10% |
| Manufacturing | 0% | 1% | 0% | 0% | 0% |
| Mining | 0% | 0% | 15% | 0% | 0% |
| Municipal | 45% | 91% | 65% | 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 2016




Well data from TWDB groundwater database

# Queen City Uses

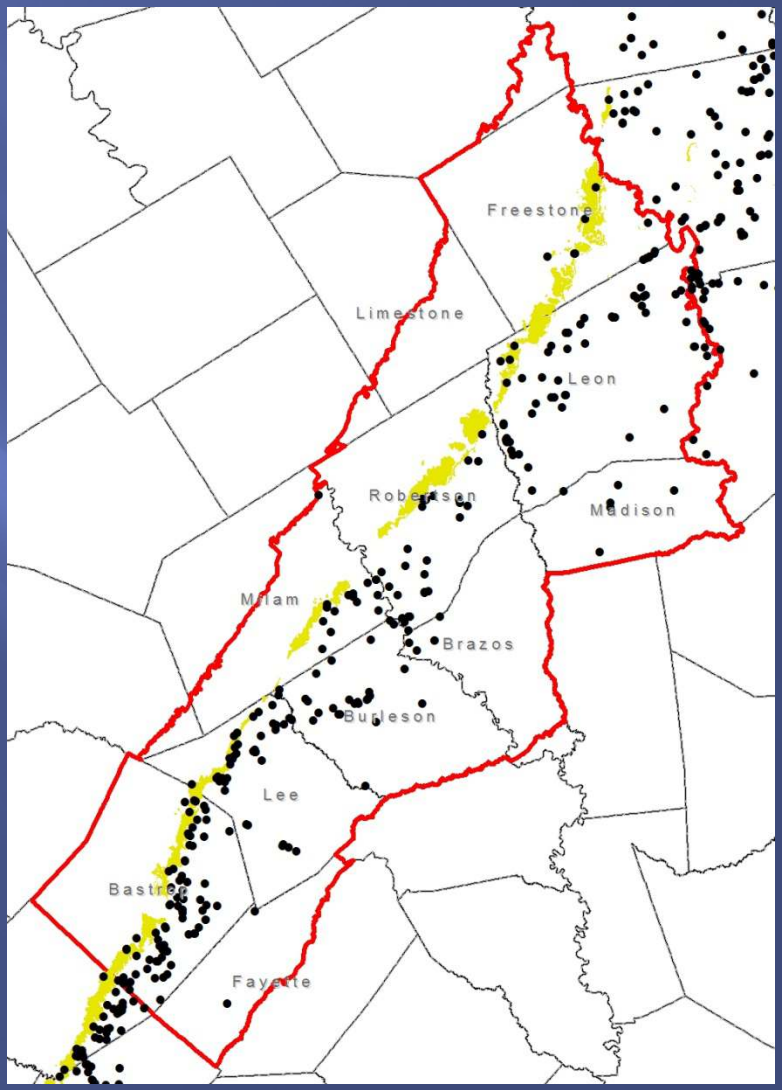
- Groundwater primarily produced from shallow to moderately deep wells (mostly less than 1000 feet deep)
- Groundwater primarily used for irrigation, domestic, and livestock
- Some used for municipal
- Some significant users:
  - Rural WSCs in METGCD
  - Town of Lincoln, Lee County WSC
  - Landowners for livestock and domestic purposes

# 2018 Queen City Uses

| Approximate Queen City 2018 Groundwater Use (Percent) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 60% | 0% | 5% | 0% | 5% |
| Livestock | 15% | 14% | <5% | 5% | 5% |
| Manufacturing | 0% | 0% | 0% | 10% | 0% |
| Mining | 0% | 0% | 40+% | 0% | 0% |
| Municipal | 25% | 86% | 50+% | 85% | 90% |
| Steam-Electric Power | 0% | 0% | 0% | 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 2016



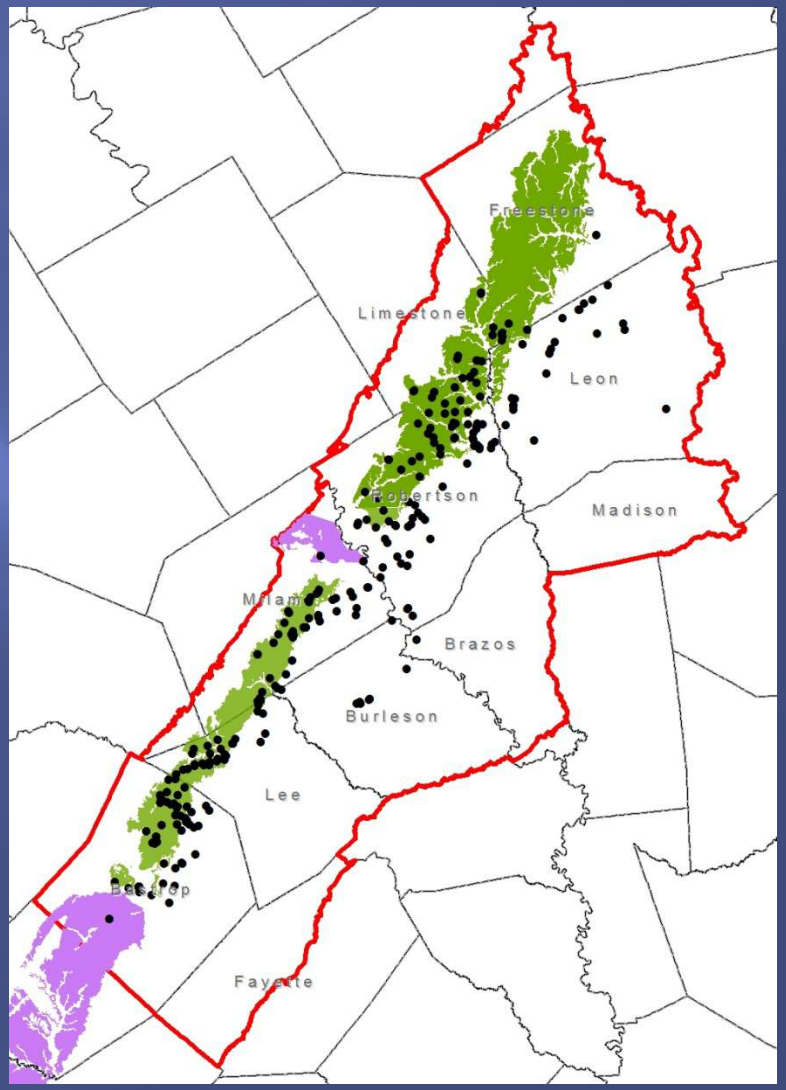

Well data from TWDB groundwater database

# Carrizo Uses

- Wells up to about 2,500 feet in depth
- Groundwater primarily used for municipal, domestic, and livestock
- Some used for irrigation
- Some significant users:
  - Cities of Giddings, Smithville
  - Fayette WSC, Aqua WSC, Lee County WSC
  - TDCJ Ferguson unit (~1,350 ac-ft/yr)
  - Rural WSCs (~300 ac-ft/yr)
  - Texas A&M University and College Station
  - SAWS Vista Ridge project

# Calvert Bluff Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across much of GMA 12
- Moderate historic use
- Moderate number of wells
- Most wells are shallow
- DFCs in 2016



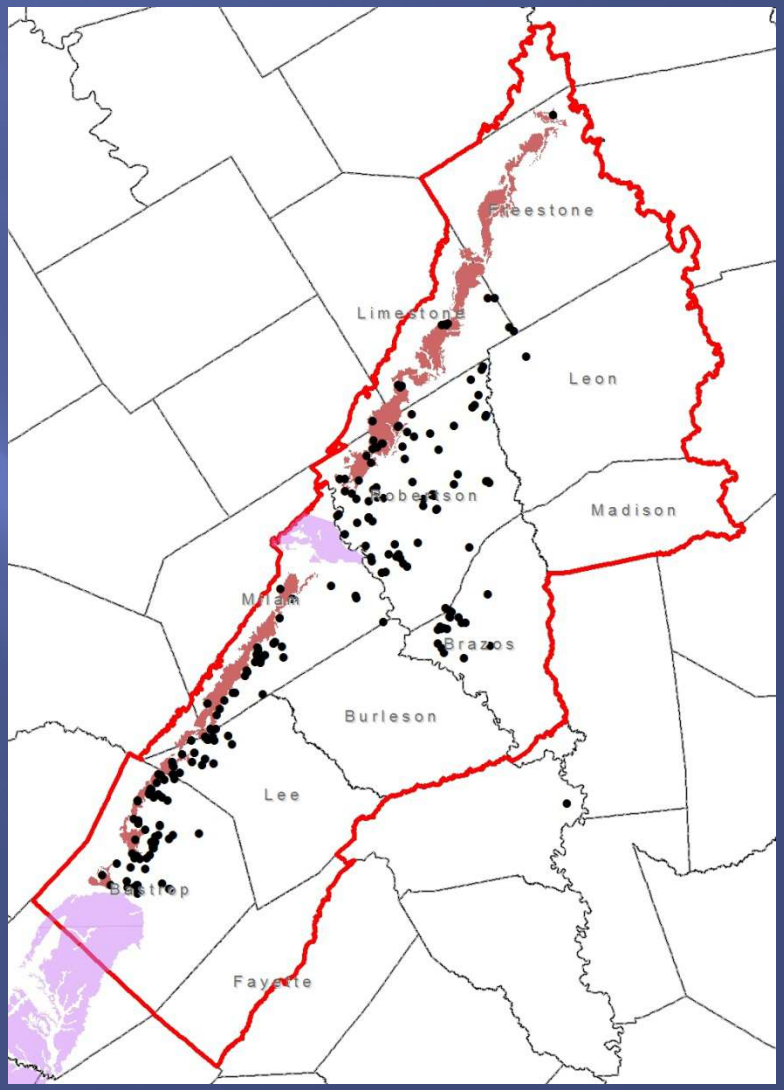

Well data from TWDB groundwater database

# Calvert Bluff Uses

- Groundwater mostly produced from shallow wells (mostly less than 800 feet deep)
- 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 ac-ft/yr)
  - Land and livestock owners

# Simsboro Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across much of GMA 12
- Significant historic use
- Moderate number of wells
- Wells can be very deep
- DFCs in 2016




Well data from TWDB groundwater database

# Simsboro Uses

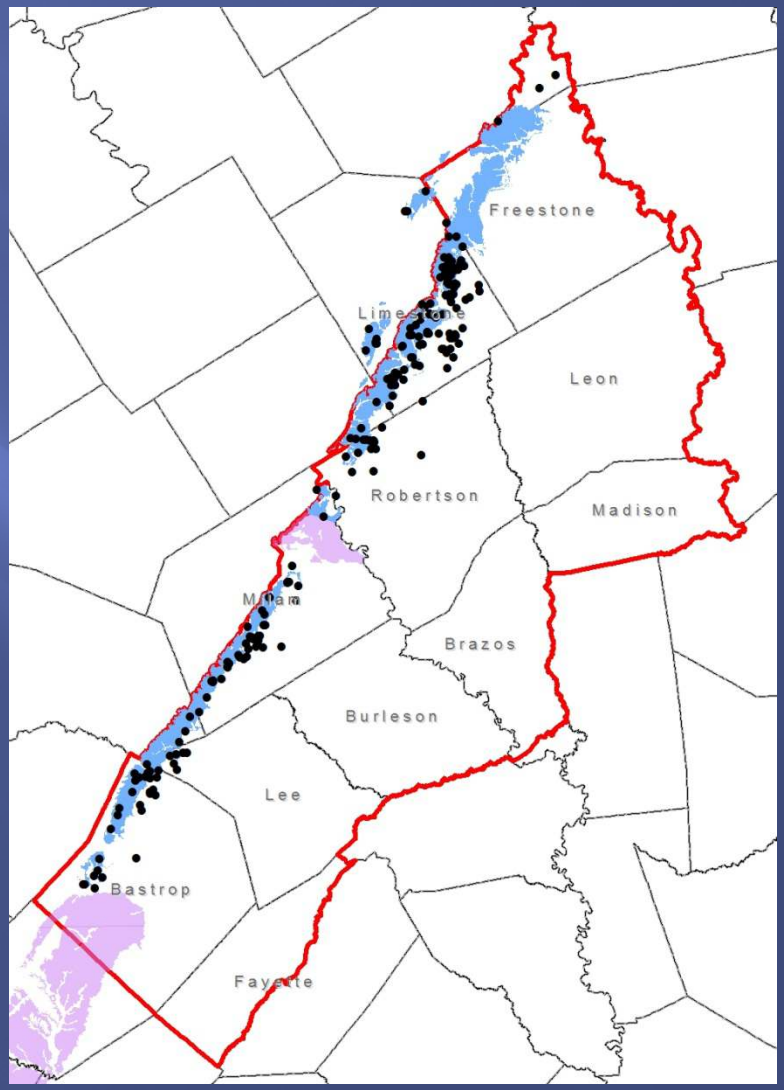
- Groundwater produced from wells up to 3,000 feet deep
- Groundwater primarily used for municipal, irrigation, and mine depressuring
- Some used for livestock and industrial

# Simsboro Uses

- Some significant users:
  - Manville WSC, Aqua WSC, several METGCD WSCs
  - LCRA
  - Cities of Bryan/College Station, Elgin, Hearne, and Franklin
  - Texas A&M University
  - NRG, Texas Power LLC and OPTIM ENERGY
  - Landowners
- Large water projects
  - Forestar
  - End Op
  - SAWS Vista Ridge project

# Hooper Aquifer

- Part of Carrizo-Wilcox, which is a major aquifer
- Present across much of GMA 12
- Low historic use
- Moderate number of wells
- Wells are shallow
- DFCs in 2016




Well data from TWDB groundwater database

# Hooper Uses

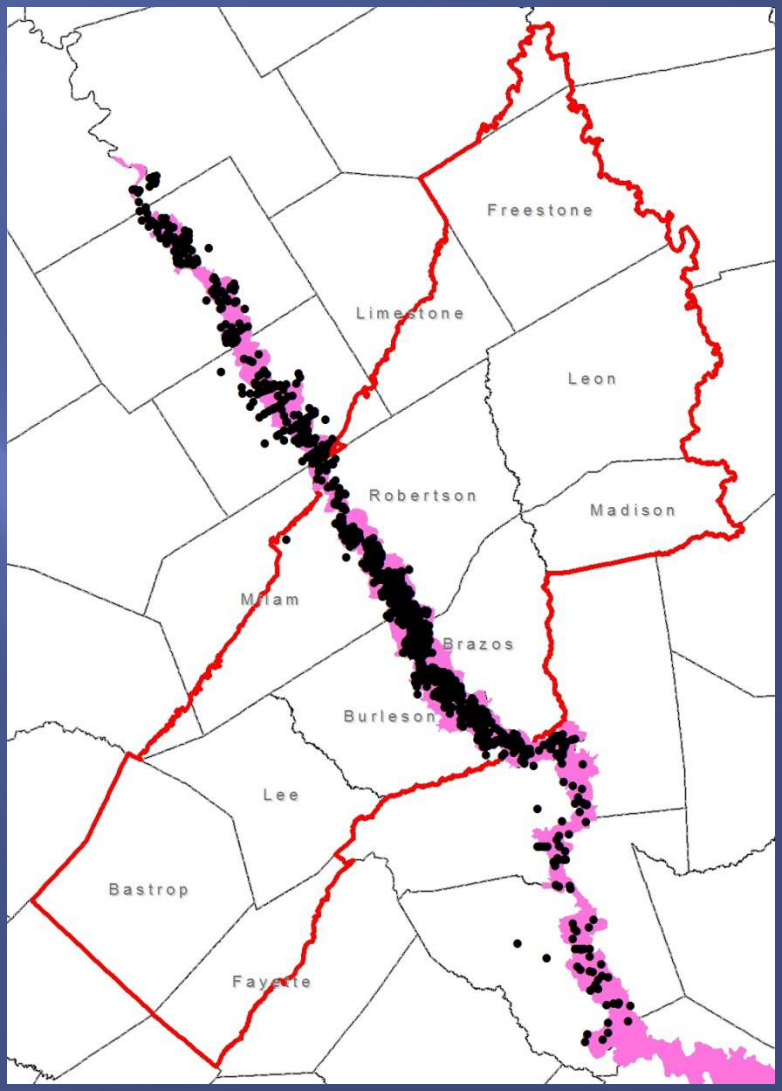
- Groundwater primarily produced from shallow wells- mostly less than 500 feet deep
- Groundwater primarily used for domestic and livestock purposes
- Some used for power generation and municipal purposes
- Some significant users:
  - Cities of Fairfield, Teague
  - TDCJ Boyd Unit
  - City of Bremond in Robertson County

# 2018 Carrizo-Wilcox Uses

| Approximate Carrizo-Wilcox 2018 Groundwater Use (Percent) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 10% | 34% | 25% | 10% | 95+% |
| Livestock | <5% | 7% | <5% | 5% | 0% |
| Manufacturing | <5% | 5% | <5% | 10% | 0% |
| Mining | <1% | 0% | 5% | 10% | 0% |
| Municipal | 80-85% | 59% | 55+% | 65% | 0%* |
| Steam-Electric Power | 0% | 0% | 10% | 0% | 0% |

# Brazos River Alluvium Aquifer

- Minor Aquifer
- Localized in GMA 12
- Moderate historic use
- Numerous wells
- Wells are very shallow
- DFCs in 2016




Well data from TWDB groundwater database

# Brazos River Alluvium Uses

- Groundwater primarily produced from very shallow wells (less than 100 feet deep)
- 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

# 2018 Brazos River Alluvium Uses

| Approximate Brazos River Alluvium 2018 Groundwater Use (Percent) | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | NA | 100% | 95+% | NA | NA |
| Livestock | NA | 0% | <5% | NA | NA |
| Manufacturing | NA | 0% | 0% | NA | NA |
| Mining | NA | 0% | 0% | NA | NA |
| Municipal | 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 is used for municipal purposes in most of the GMA (other than Brazos River Alluvium)

| Estimated 2018 Water Use Met With Groundwater | | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Irrigation | 100% | 99% | 90% | 100% | 90% |
| Livestock | 25% | 30% | 20% | 10% | 75% |
| Manufacturing | 100% | 89% | 100% | 0% | 30% |
| Mining | 95+% | 95+% | 80% | 50% | 60% |
| Municipal | 100% | 67% | 95% | 100% | 100% |
| Steam-Electric Power | 75% | 0% | 25% | 0% | 0% |

# Summary

- In much of the GMA, most groundwater production is from the Carrizo-Wilcox, especially the Simsboro (other than Brazos River Alluvium)

| | 2018 Metered/Reported Groundwater Production (acre-feet) | | | | |
|---|---|---|---|---|---|
| | LPGCD | POSGCD | BVGCD | METGCD | FCGCD |
| Colorado/Brazos River Alluvium | 1,252* | 9,801 | 142,853 | NA | 55 |
| Yegua-Jackson | 0 | 152 | 1,183 | 9 | 965 |
| Sparta | 225 | 958 | 4,309 | 2,356 | 0 |
| Queen City | 249 | 313 | 118 | 585 | 163 |
| Carrizo | 2,834 | 1,067 | 758 | 1,102 | 166 |
| Calvert Bluff | 1,050 | 412 | 193 | 5,175 | NA |
| Simsboro | 18,704 | 4,932 | 58,297 | 1,213 | NA |
| Hooper | 677 | 361 | 809 | 3,685 | NA |
| *Carrizo-Wilcox* | *23,264* | *6,773* | *60,058* | *11,174* | *0* |
| TOTAL | 24,991 | 17,996 | 208,520 | 14,123 | 1,349 |

# QUESTIONS?