

GMA 12

**Hydrological Conditions:
Brazos River Alluvium
and
Gulf Coast Aquifer**

DFC CONSIDERATIONS TWC 36.108(D)

*Aquifer Uses
or Conditions*

*Supply Needs &
Management
Strategies*

*Hydrological
Conditions*

*Environmental
Impacts*

*Subsidence
Impacts*

*Socioeconomic
Impacts*

*Private Property
Rights*

DFC Feasibility

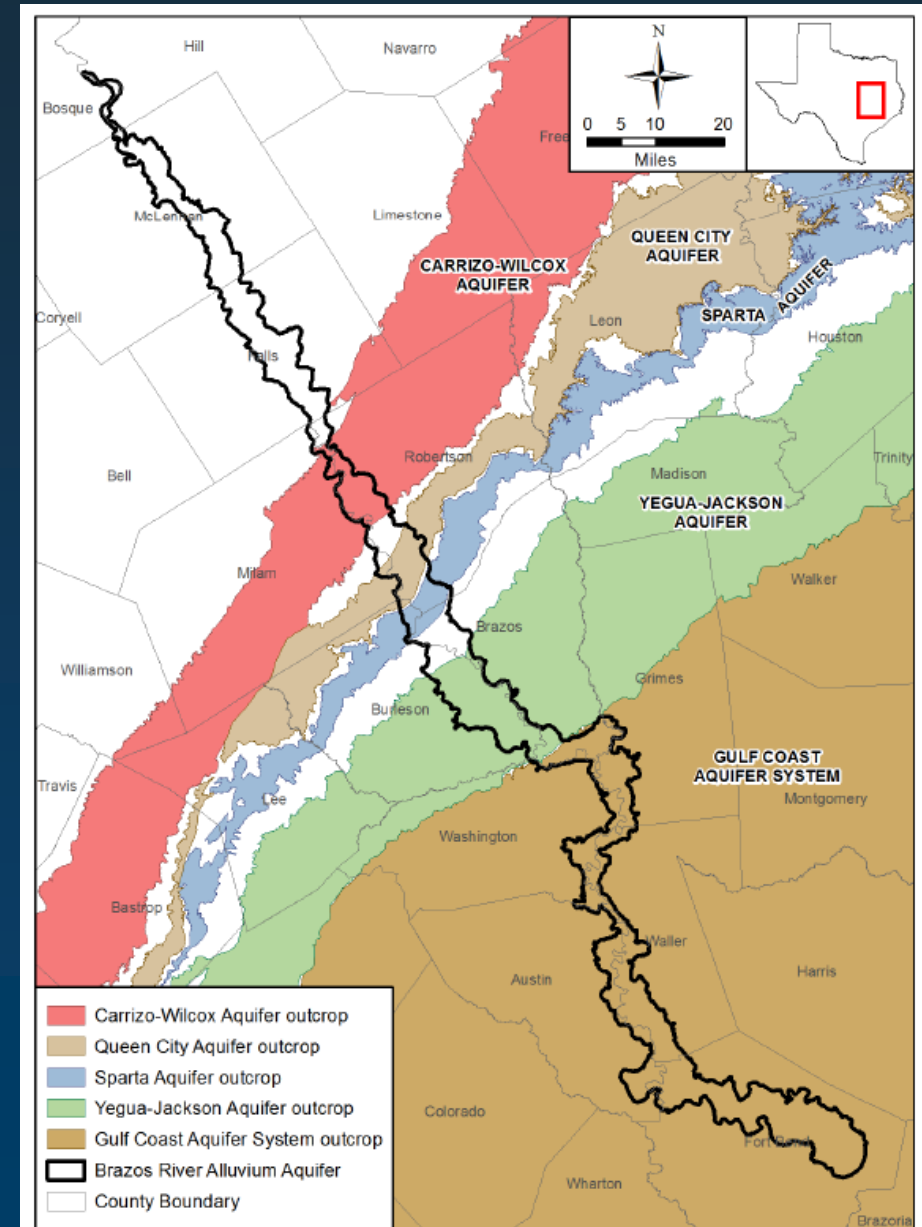
*Other Relevant
Information*

AQUIFERS WITHIN GMA 12

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

BRAZOS RIVER ALLUVIUM AQUIFER

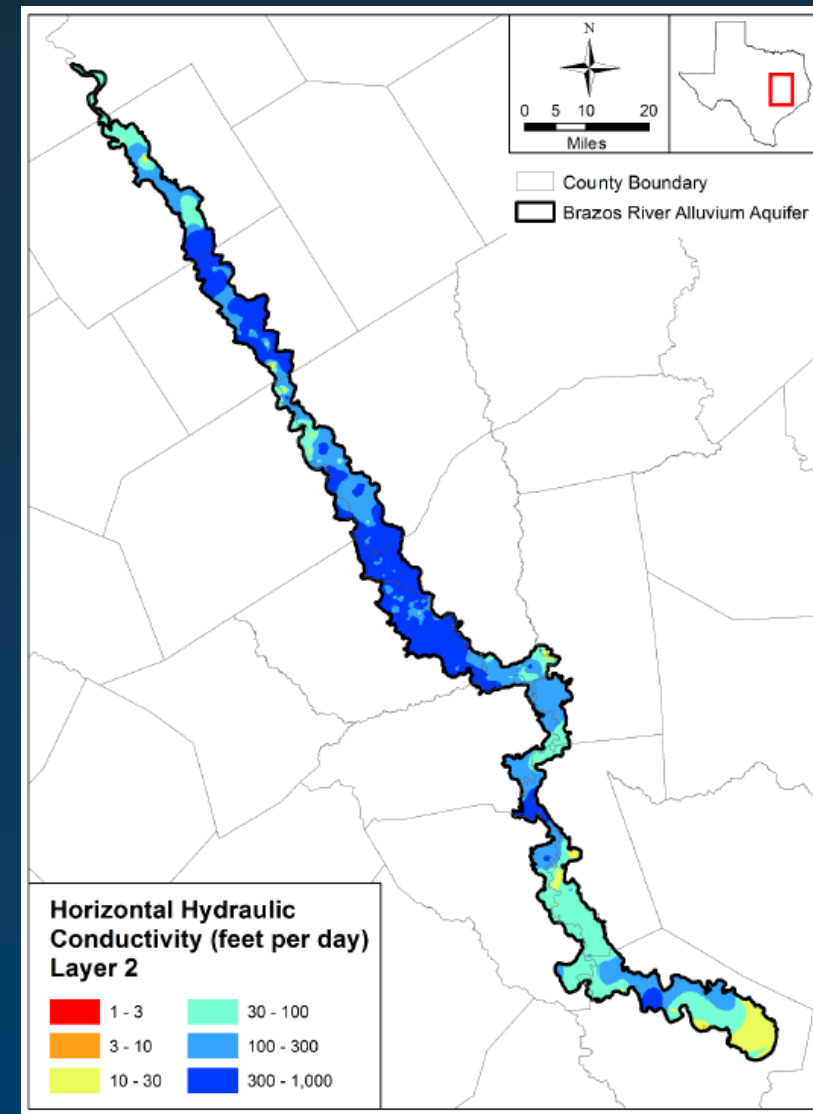
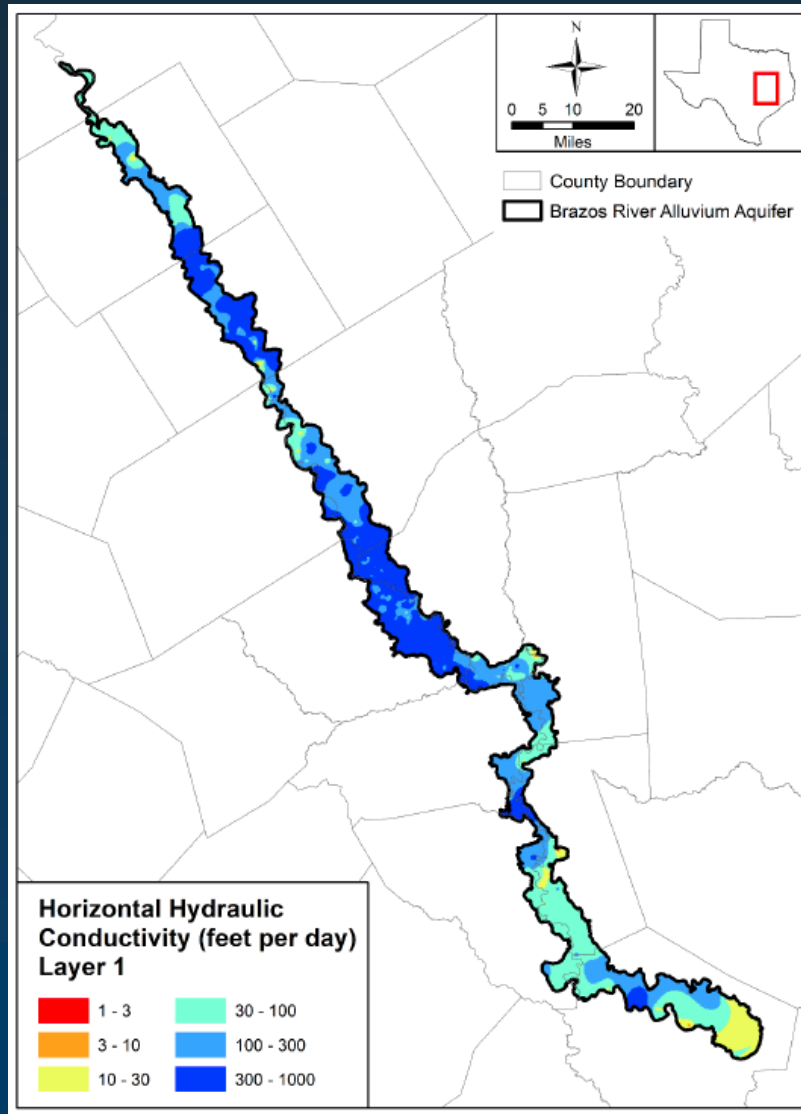
- **Minor Aquifer**
- **Localized in GMA 12**
- **Moderate historic use**
- **Numerous wells**
- **Wells are very shallow**
- **DFCs established in 2016**



BRAZOS RIVER ALLUVIUM CONDITIONS

- **Alluvium is deposited by the Brazos River**
 - **typically, within a few miles of the river**
- **Wells are shallow (<100 feet)**
- **Water quality is generally fresh**
 - **some pockets of poorer quality water**
- **Fairly consistent aquifer conditions across the extent of the aquifer within GMA 12**
- **Can be fairly productive**
- **Majority of water produced from the Brazos River Alluvium is for irrigation**
- **Occurs within Brazos Valley GCD and Post Oak Savannah GCD**

BRAZOS RIVER ALLUVIUM HYDRAULIC CONDUCTIVITY



BRAZOS RIVER ALLUVIUM AQUIFER TERS BY COUNTY

<i>County</i>	<i>Total Storage (acre-feet)</i>	<i>25 percent of Total Storage (acre-feet)</i>	<i>75 percent of Total Storage (acre-feet)</i>
Brazos	290,000	72,500	217,500
Burleson	450,000	112,500	337,500
Falls	140	35	105
Milam	28,000	7,000	21,000
Robertson	270,000	67,500	202,500
Total	1,038,140	259,535	778,605

Source: TWDB GAM Task 13-035 Version 2 (Wade and Shi, 2014)

BRAZOS RIVER ALLUVIUM AQUIFER TERS BY GCD

<i>Groundwater Conservation District (GCD)</i>	<i>Total Storage (acre-feet)</i>	<i>25percent of Total Storage (acre-feet)</i>	<i>75percent of Total Storage (acre-feet)</i>
No district	140	35	105
Brazos Valley GCD	560,000	140,000	420,000
Post Oak Savannah GCD	480,000	120,000	360,000
Total	1,040,140	260,035	780,105

Source: TWDB GAM Task 13-035 Version 2 (Wade and Shi, 2014)

BRAZOS RIVER ALLUVIUM AQUIFER ANNUAL RECHARGE, INFLOWS, AND DISCHARGE

- **Provided by the TWDB in GAM Run reports in support of management plan development**
- **Brazos Valley GCD = TWDB GAM Run 23-009**
- **Post Oak Savannah GCD = TWDB GAM Run 22-007**

ANNUAL RECHARGE, INFLOWS, AND DISCHARGE

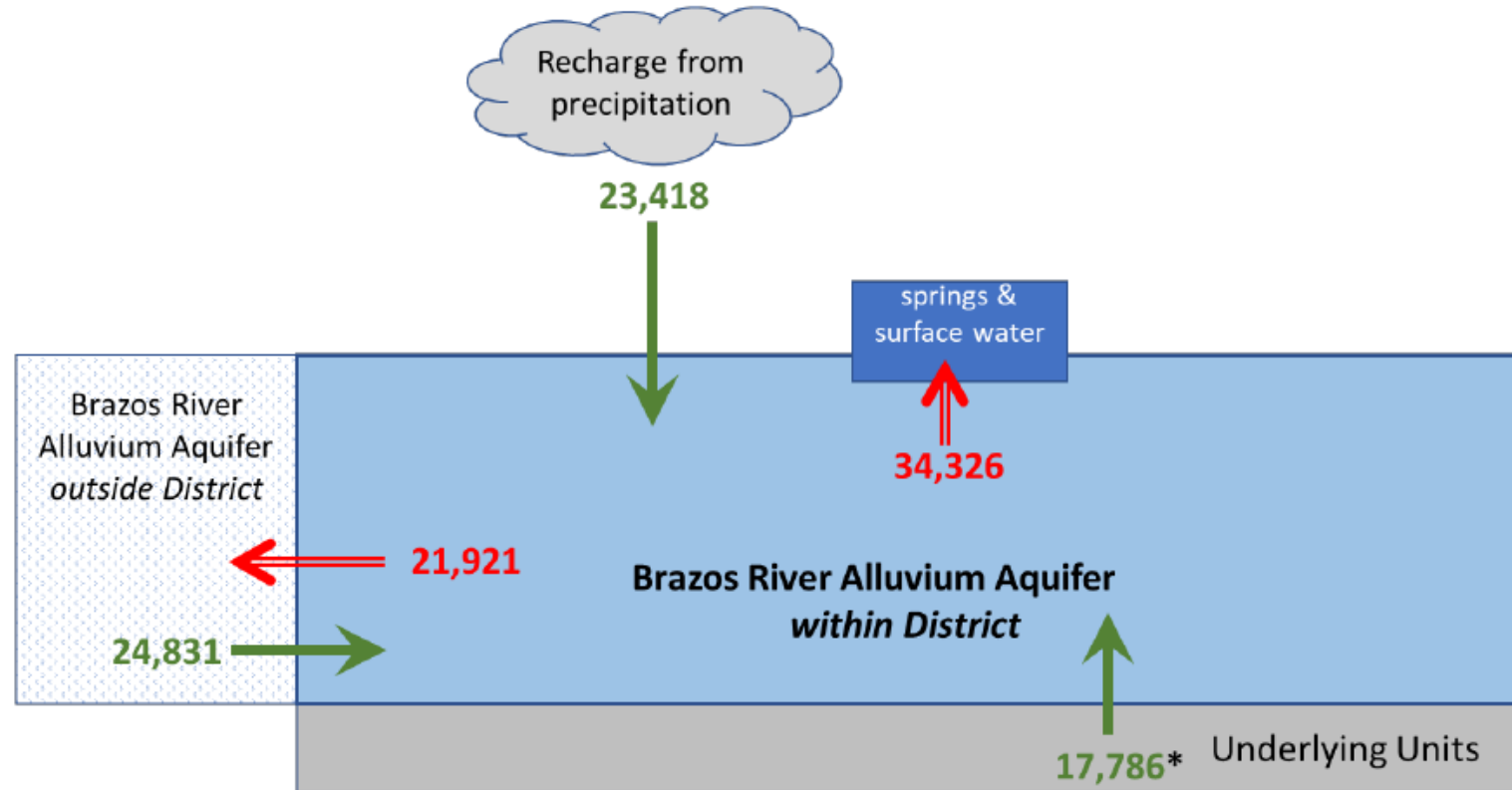
BRAZOS VALLEY GCD

BRAZOS RIVER ALLUVIUM AQUIFER

Management Plan Requirement	Aquifer or Confining Unit	Results (AFY)
Estimated annual amount of recharge from precipitation to the district	Brazos River Alluvium Aquifer	23,418
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Brazos River Alluvium Aquifer	34,326
Estimated annual volume of flow into the district within each aquifer in the district	Brazos River Alluvium Aquifer	24,831
Estimated annual volume of flow out of the district within each aquifer in the district	Brazos River Alluvium Aquifer	21,921
Estimated net annual volume of flow between each aquifer in the district	To Brazos River Alluvium Aquifer from Carrizo-Wilcox Aquifer	2,286
	To Brazos River Alluvium Aquifer from Queen City Aquifer	6,262
	To Brazos River Alluvium Aquifer from Sparta Aquifer	3,860
	To Brazos River Alluvium Aquifer from Yegua-Jackson Aquifer	2,431
	To Brazos River Alluvium Aquifer from Gulf Coast Aquifer System	2,176
	To Brazos River Alluvium Aquifer from older confining units	771

BRAZOS VALLEY GCD

BRAZOS RIVER ALLUVIUM AQUIFER



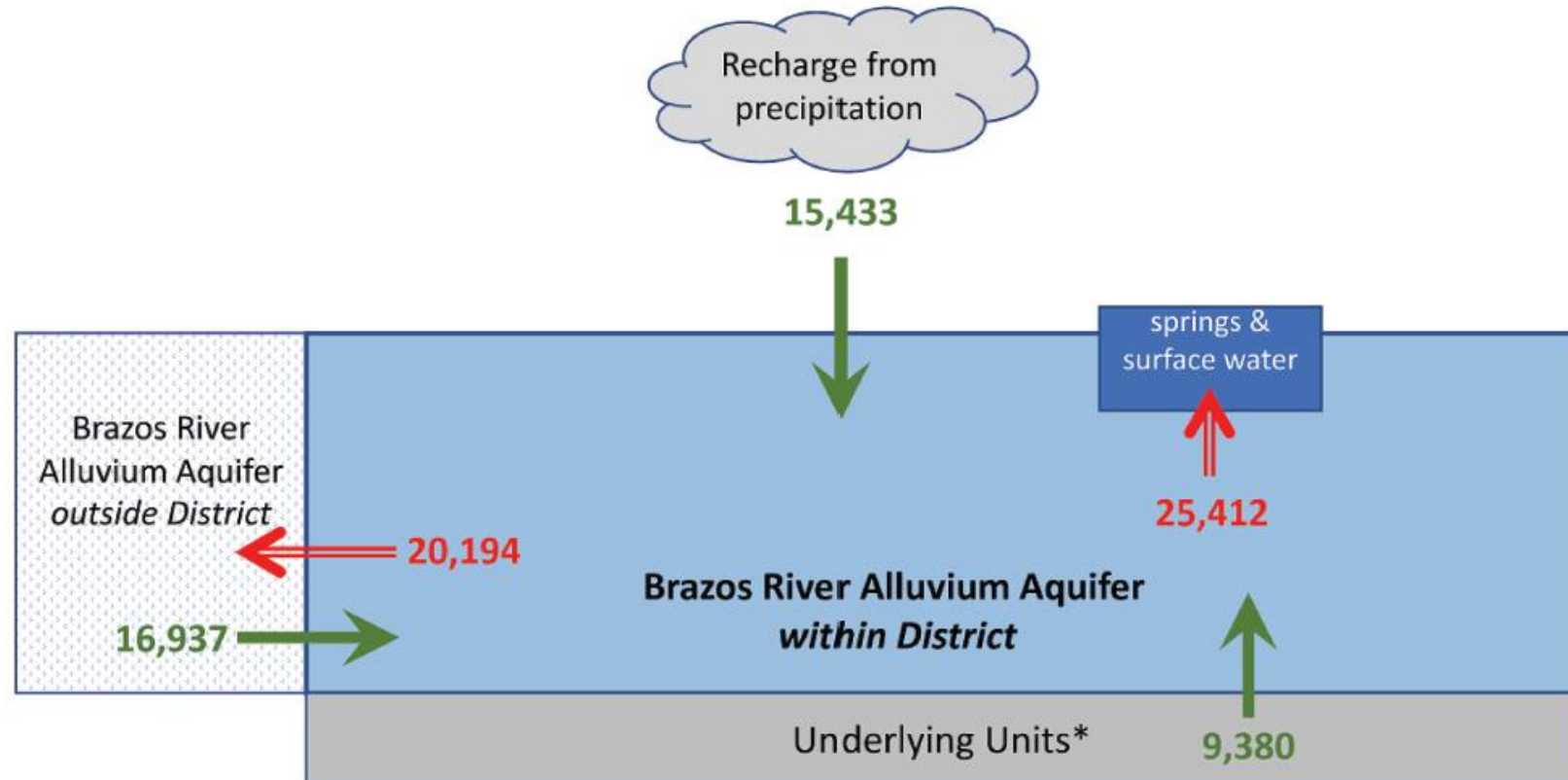
* Flow from underlying units includes net inflow of 2,286 acre-feet per year from the Carrizo-Wilcox Aquifer, net inflow of 6,262 acre-feet per year from the Queen City Aquifer, net inflow of 3,860 acre-feet per year from the Sparta Aquifer, net inflow of 2,431 acre-feet per year from the Yegua-Jackson Aquifer, net inflow of 2,176 acre-feet per year from the Gulf Coast Aquifer System, and net inflow of 771 acre-feet per year from older confining units.

Caveat: This diagram only includes the water budget items provided in Table 6. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.

ANNUAL RECHARGE, INFLOWS, AND DISCHARGE POST OAK SAVANNAH GCD BRAZOS RIVER ALLUVIUM AQUIFER

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Brazos River Alluvium Aquifer	15,433
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers.	Brazos River Alluvium Aquifer	25,412
Estimated annual volume of flow into the district within each aquifer in the district	Brazos River Alluvium Aquifer	16,937
Estimated annual volume of flow out of the district within each aquifer in the district	Brazos River Alluvium Aquifer	20,194
Estimated net annual volume of flow between each aquifer in the district	To the Brazos River Alluvium Aquifer from the Yegua-Jackson Aquifer	2,802
	To the Brazos River Alluvium Aquifer from the Sparta Aquifer	3,760
	To the Brazos River Alluvium Aquifer from the Queen City Aquifer	1,669
	To the Brazos River Alluvium Aquifer from the Carrizo-Wilcox Aquifer	645
	To the Brazos River Alluvium Aquifer from confining units	504

POST OAK SAVANNAH GCD BRAZOS RIVER ALLUVIUM AQUIFER

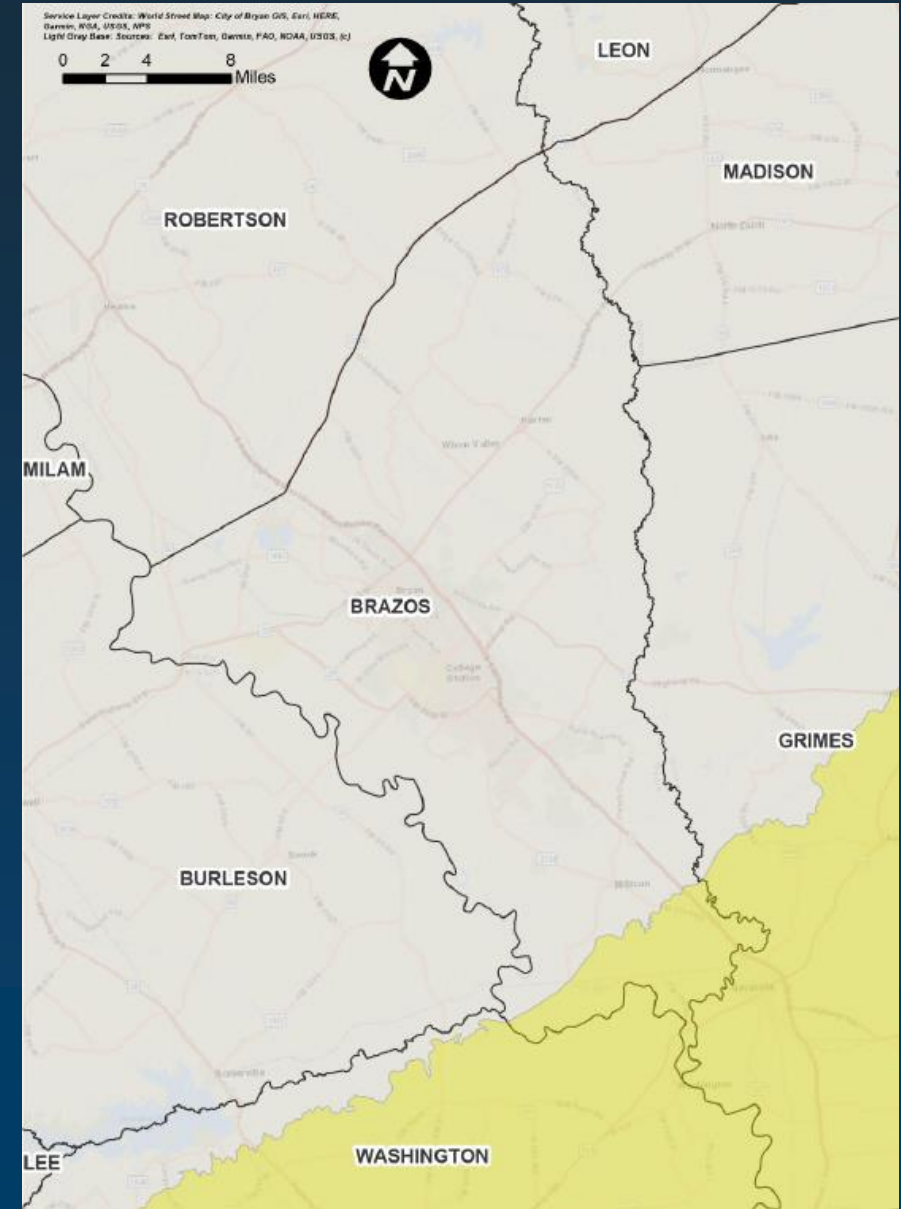


* Flow from underlying units includes net inflows of 2,802 acre-feet per year from the Yegua-Jackson Aquifer, 3,760 acre-feet per year from the Sparta Aquifer, 1,669 acre-feet per year from the Queen City Aquifer, 645 acre-feet per year from the Carrizo-Wilcox Aquifer and 504 acre-feet per year from confining units.

Caveat: This diagram only includes the water budget items provided in Table 6. A complete water budget would include additional inflows and outflows. If the District requires values for additional water budget items, please contact TWDB.

GULF COAST AQUIFER SYSTEM

- **Major Aquifer**
- **Very limited in areal extent**
 - **Present in only the very south part of Brazos County**
- **Minor historic use in GMA12**
 - **Only provide water in small quantities**
 - **Domestic and Livestock use**
- **Declared not relevant in Brazos Valley GCD**



GULF COAST AQUIFER TERS BY COUNTY

<i>County</i>	<i>Total Storage (acre-feet)</i>	<i>25 percent of Total Storage (acre-feet)</i>	<i>75 percent of Total Storage (acre-feet)</i>
Brazos	450,000	112,500	337,500
Total	450,000	112,500	337,500

Source: TWDB GAM Task 13-035 Version 2 (Wade and Shi, 2014)

GULF COAST AQUIFER ANNUAL RECHARGE, INFLOWS, AND DISCHARGE

- **Provided by the TWDB in GAM Run reports in support of management plan development**
- **Brazos Valley GCD = TWDB GAM Run 23-009**

ANNUAL RECHARGE, INFLOWS, AND DISCHARGE

BRAZOS VALLEY GCD

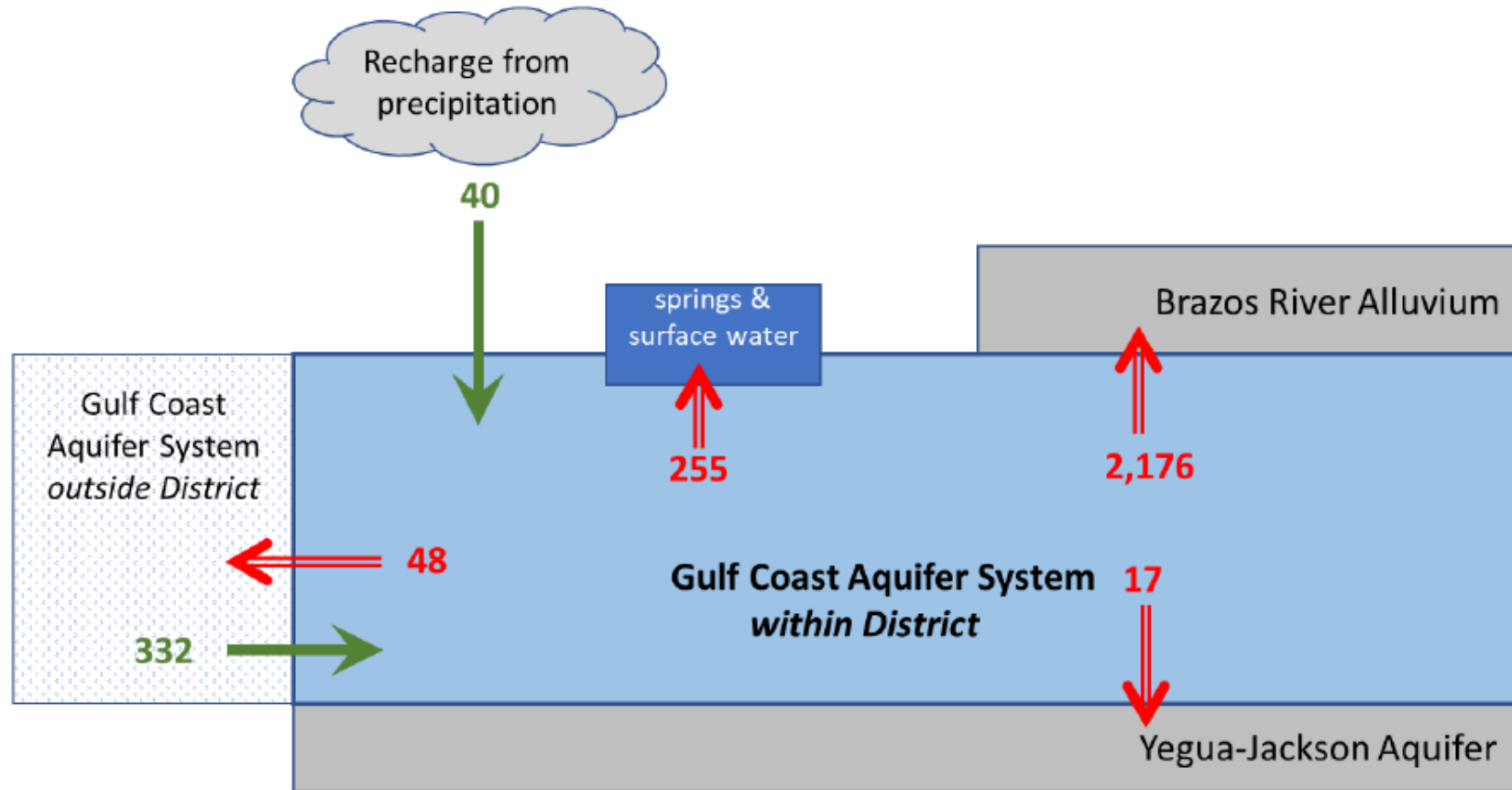
GULF COAST AQUIFER

Management Plan Requirement	Aquifer or Confining Unit	Results (AFY)
Estimated annual amount of recharge from precipitation to the district	Gulf Coast Aquifer System	40
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Gulf Coast Aquifer System	255
Estimated annual volume of flow into the district within each aquifer in the district	Gulf Coast Aquifer System	332
Estimated annual volume of flow out of the district within each aquifer in the district	Gulf Coast Aquifer System	48
Estimated net annual volume of flow between each aquifer in the district	From Gulf Coast Aquifer System to Yegua-Jackson Aquifer*	17
	From Gulf Coast Aquifer System to Brazos River Alluvium Aquifer**	2,176

* Estimated from the groundwater availability model for the Yegua-Jackson Aquifer.

** Estimated from the groundwater availability model for the Brazos River Alluvium Aquifer.

BRAZOS VALLEY GCD GULF COAST AQUIFER



Caveat: This diagram only includes the water budget items provided in Table 5. A complete water budget would include additional inflows and outflows. For a full groundwater budget, please submit a request in writing to the Groundwater Modeling Department.

Source: TWDB GAM Run 23-009 (Cawthon and Dowlearn, 2023)

QUESTIONS?