

# GMA 8 Joint Groundwater Planning Meeting

February 26, 2020



## Agenda Item 6

### Discussion and possible action on results from updated NTWGAM run related to Joint Planning in GMA 8

💧 Run 11 – Update of NTWGAM DFC/MAG Run

💧 WSP has received pumping updates from:

- *Upper Trinity GCD*
- *Southern Trinity GCD*
- *Prairielands GCD*

💧 WSP is working with Central Texas GCD to complete simulations related to impacts in the Llano Uplift aquifers using the Llano Uplift GAM

- *Central Texas GCD is funding this effort separately*

## Upper Trinity GCD pumping

Aquifer	O/D*	County	acft
Glen Rose	Outcrop	Hood	792
Glen Rose	Downdip	Hood	125
Paluxy	Outcrop	Hood	159
Twin Mountains	Outcrop	Hood	5,025
Twin Mountains	Downdip	Hood	10,768
Antlers	Outcrop	Montague	6,114
Antlers	Downdip	Montague	
Antlers	Outcrop	Parker	2,905
Antlers	Downdip	Parker	
Glen Rose	Outcrop	Parker	3,684
Glen Rose	Downdip	Parker	1,406
Paluxy	Outcrop	Parker	2,614
Paluxy	Downdip	Parker	50
Twin Mountains	Outcrop	Parker	1,294
Twin Mountains	Downdip	Parker	2,527
Antlers	Outcrop	Wise	9,106
Antlers	Downdip	Wise	2,439
<b>TOTAL</b>			<b>49,009</b>

\*O/D refers to the "outcrop" or "downdip" portion of each aquifer



## Upper Trinity GCD pumping

Aquifer	O/D	County	Run 10 AFY	Adjustment	Run 11 AFY
Glen Rose	Outcrop	Hood	654	138	792
Glen Rose	Downdip	Hood	103	22	125
Paluxy	Outcrop	Hood	159	0	159
Twin Mountains	Outcrop	Hood	3,674	1,351	5,025
Twin Mountains	Downdip	Hood	7,854	2,914	10,768
Antlers	Outcrop	Montague	3,878	2,236	6,114
Antlers	Downdip	Montague			
Antlers	Outcrop	Parker	2,899	6	2,905
Antlers	Downdip	Parker			
Glen Rose	Outcrop	Parker	2,290	1,394	3,684
Glen Rose	Downdip	Parker	874	532	1,406
Paluxy	Outcrop	Parker	2,609	5	2,614
Paluxy	Downdip	Parker	50	0	50
Twin Mountains	Outcrop	Parker	1,074	220	1,294
Twin Mountains	Downdip	Parker	2,083	444	2,527
Antlers	Outcrop	Wise	7,702	1,404	9,106
Antlers	Downdip	Wise	2,058	381	2,439
-	-	Total	37,961	11,048	49,009



## Southern Trinity GCD pumping

Year	Hosston Run 10 AFY	Adjustement for Hosston	Hosston Run 11 AFY
2010	15,937	-4,135	11,802
2011	15,937	-4,635	11,302
2012	15,937	-5,361	10,576
2013	15,937	-6,978	8,959
2014	15,937	-8,424	7,513
2015	15,937	-7,565	8,372
2016	15,937	-7,074	8,863
2017	15,937	-7,929	8,008
2018	15,937	-8,130	7,807
2019	15,937	-8,135	7,802
2020-2070	15,937	0	15,937

## Prairielands GCD pumping

<b>Aquifer</b>	<b>Run 10 AFY</b>	<b>Adjustment</b>	<b>Run 11 AFY</b>
<b>Woodbine</b>	4,642	-2,475	2,168
<b>Fred/Wash</b>	3,112	-2,822	290
<b>Paluxy</b>	3,250	-1,460	1,790
<b>Glen Rose</b>	1,944	-1,615	329
<b>Hensell</b>	3,603	-3,011	593
<b>Pearsall</b>	98	2,810	2,908
<b>Hosston</b>	13,237	8,572	21,810
<b>Total</b>	29,887	0	29,887

## Run 11 Results - DFC

- 💧 DFC differences between Run 10 and Run 11
- 💧 Blue negative values indicate higher water levels
- 💧 Red positive values indicate greater drawdowns

## Run 11 - Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	1	4	-	10	6	11	-
Bosque	-	1	11	-	70	38	97	-
Brown	-	0	0	-	0	0	0	0
Burnet	-	-	0	-	2	0	0	-
Callahan	-	-	-	-	-	-	-	0
Collin	4	15	23	59	-	-	-	36
Comanche	-	0	0	-	1	0	0	0
Cooke	0	-	-	-	-	-	-	13
Coryell	-	0	2	-	11	7	14	-
Dallas	-16	-3	20	144	206	71	230	-
Delta	-	10	11	-	13	-	-	-
Denton	0	1	14	71	-	-	-	26
Eastland	-	-	-	-	-	-	-	0

## Run 11 – Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	-65	-30	20	297	251	87	288	-
Erath	-	0	0	2	7	0	7	1
Falls	-	14	22	-	34	31	34	-
Fannin	3	14	17	37	23	-	-	16
Grayson	1	10	16	38	-	-	-	16
Hamilton	-	0	0	-	5	2	9	-
Hill	-15	-14	16	-	201	82	245	-
Hunt	14	19	22	40	32	-	-	-
Johnson	-13	-60	-50	61	148	45	219	-
Kaufman	13	44	61	111	125	89	132	-
Lamar	1	3	5	-	8	-	-	7
Lampasas	-	0	0	-	0	0	1	-
Limestone	-	22	52	-	83	69	83	-

## Run 11 - Change in Drawdown in 2070

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	1	8	24	-	69	48	78	-
Milam	-	-	8	-	10	7	10	-
Mills	-	0	0	-	2	0	0	-
Navarro	-30	-9	68	-	145	101	145	-
Red River	0	1	2	-	3	-	-	1
Rockwall	11	33	40	84	-	-	-	-
Somervell	-	0	0	40	46	3	95	-
Tarrant	-2	-15	4	79	-	-	-	33
Taylor	-	-	-	-	-	-	-	0
Travis	-	-	1	-	3	0	2	-
Williamson	-	-	1	-	3	1	3	-

## Run 11 - Change in Drawdown in 2070

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	4	36	-
Hood	Outcrop	0	1	9	-
Montague	Downdip	-	-	-	-
Montague	Outcrop	-	-	-	21
Parker	Downdip	0	20	34	-
Parker	Outcrop	0	7	5	33
Wise	Downdip	-	-	-	14
Wise	Outcrop	-	-	-	25

## Run 11 Results

💧 Drawdown (feet) from 2010 to the end of 2080

## Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Bell	-	20	91	0	311	147	348	0
Bosque	-	7	61	0	241	169	302	0
Bowie	-	-	-	0	-	0	0	-
Brown	-	2	1	0	2	1	1	2
Burnet	0	0	2	0	19	6	21	0
Callahan	-	0	0	0	0	0	0	1
Collin	486	740	383	605	-	0	0	623
Comanche	-	2	2	0	4	2	3	12
Cooke	2	0	0	0	0	0	0	195
Coryell	-	5	17	0	113	74	147	0
Dallas	120	339	300	627	577	422	603	0
Delta	-	288	207	0	213	0	0	0
Denton	20	558	376	803	0	0	0	432
Eastland	-	0	0	0	0	0	0	4

## Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
Ellis	8	93	229	646	575	365	617	0
Erath	-	6	6	8	27	13	40	13
Falls	-	165	246	0	506	311	512	0
Fannin	262	721	320	429	310	0	0	282
Franklin	-	-	-	0	-	0	0	0
Grayson	163	952	377	475	0	0	0	376
Hamilton	-	2	4	0	30	16	44	0
Hill	4	28	156	0	512	277	595	0
Hopkins	-	-	-	0	-	0	0	0
Hunt	643	626	344	430	375	0	0	0
Johnson	-10	-118	13	220	337	177	456	0
Kaufman	248	345	351	515	471	420	449	0
Lamar	43	103	112	0	131	0	0	139
Lampasas	-	1	1	0	6	1	12	0
Limestone	-	214	335	0	489	263	501	0

## Run 11 Results – Drawdown (2010-2080)

County	Woodbine	Paluxy	Glen Rose	Twin Mnts	Travis Peak	Hensell	Hosston	Antlers
McLennan	7	46	163	0	547	276	630	0
Milam	0	0	230	0	367	247	368	0
Mills	-	1	1	0	9	2	13	0
Navarro	76	126	315	0	454	373	455	0
Red River	2	25	41	0	60	0	0	15
Rockwall	282	458	374	533	-	0	0	0
Somervell	-	4	4	73	99	30	180	0
Tarrant	4	89	159	401	0	0	0	185
Taylor	-	0	0	0	0	0	0	0
Travis	0	0	84	0	153	55	158	0
Williamson	0	0	82	0	183	79	187	0

## Run 11 Results – Drawdown (2010-2080)

County	O/D	Paluxy	Glen Rose	Twin Mnts	Antlers
Hood	Downdip	-	35	83	0
Hood	Outcrop	5	9	14	0
Montague	Downdip	0	0	0	-
Montague	Outcrop	0	0	0	40
Parker	Downdip	1	52	85	-
Parker	Outcrop	6	21	7	44
Wise	Downdip	0	0	0	159
Wise	Outcrop	0	0	0	61

**Questions ?**

**wsp**

## Agenda Item 7

💧 Presentations and discussions regarding Aquifer Uses or Conditions, Supply Needs & Management Strategies, and Private Property Rights factors as they relate to Desired Future Conditions pursuant to Texas Water Code Section 36.108(d).

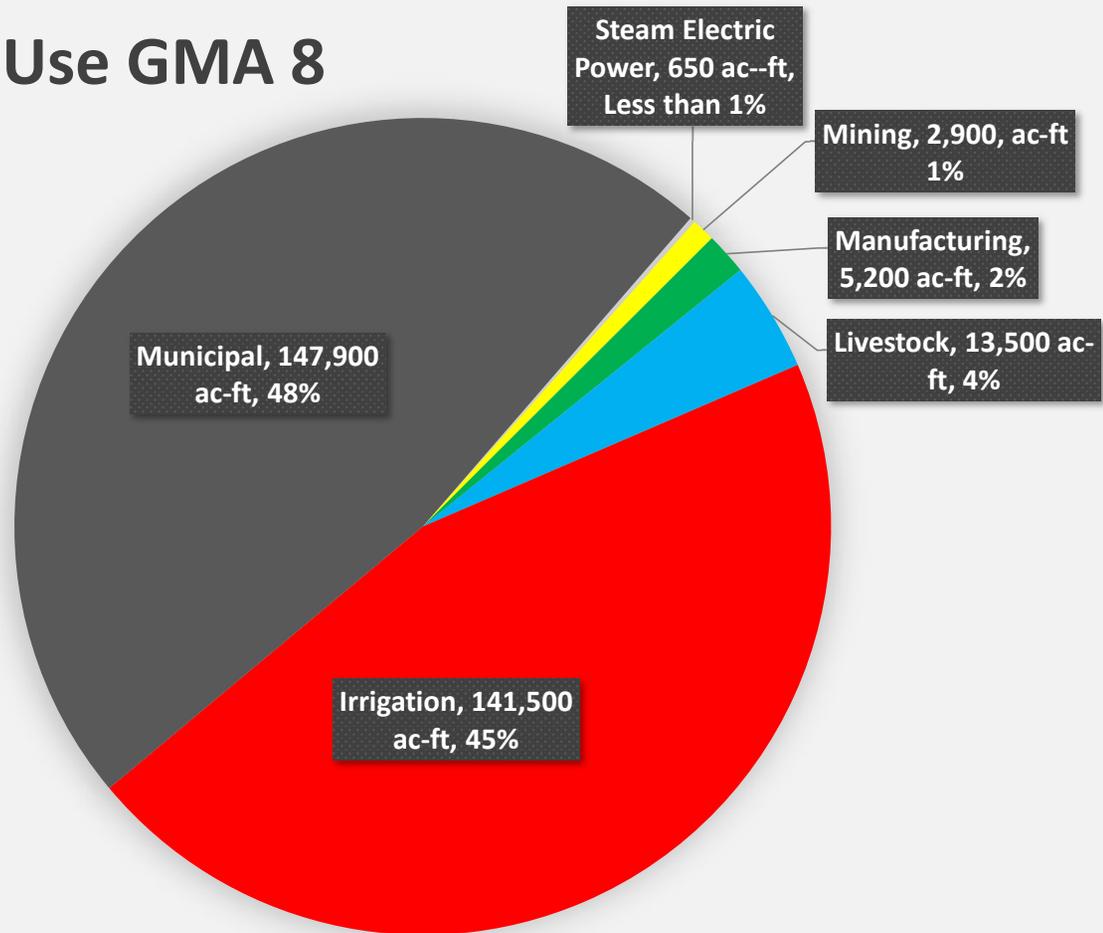
# GMA 8 Schedule to Discuss Nine Factors

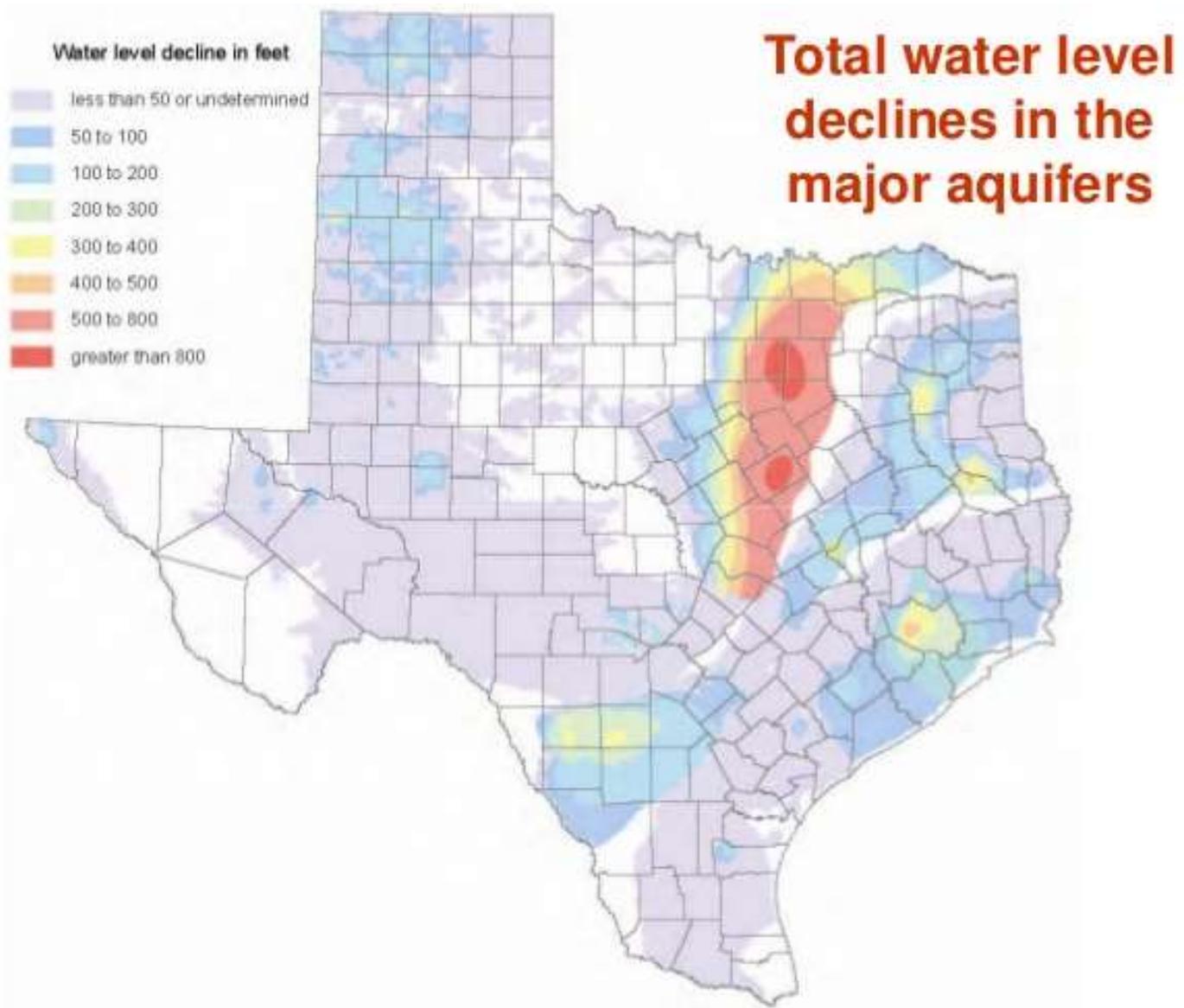
November 2019		
Environmental Impacts	Subsidence Impacts	Hydrological Conditions
February 2020		
Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights
May 2020		
Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

# Aquifer Uses or Conditions

- Aquifer Uses
  - TWDB historic use data
- Aquifer Conditions
  - Water level hydrographs
  - Presented at last meeting and made available

# Aquifer Use GMA 8



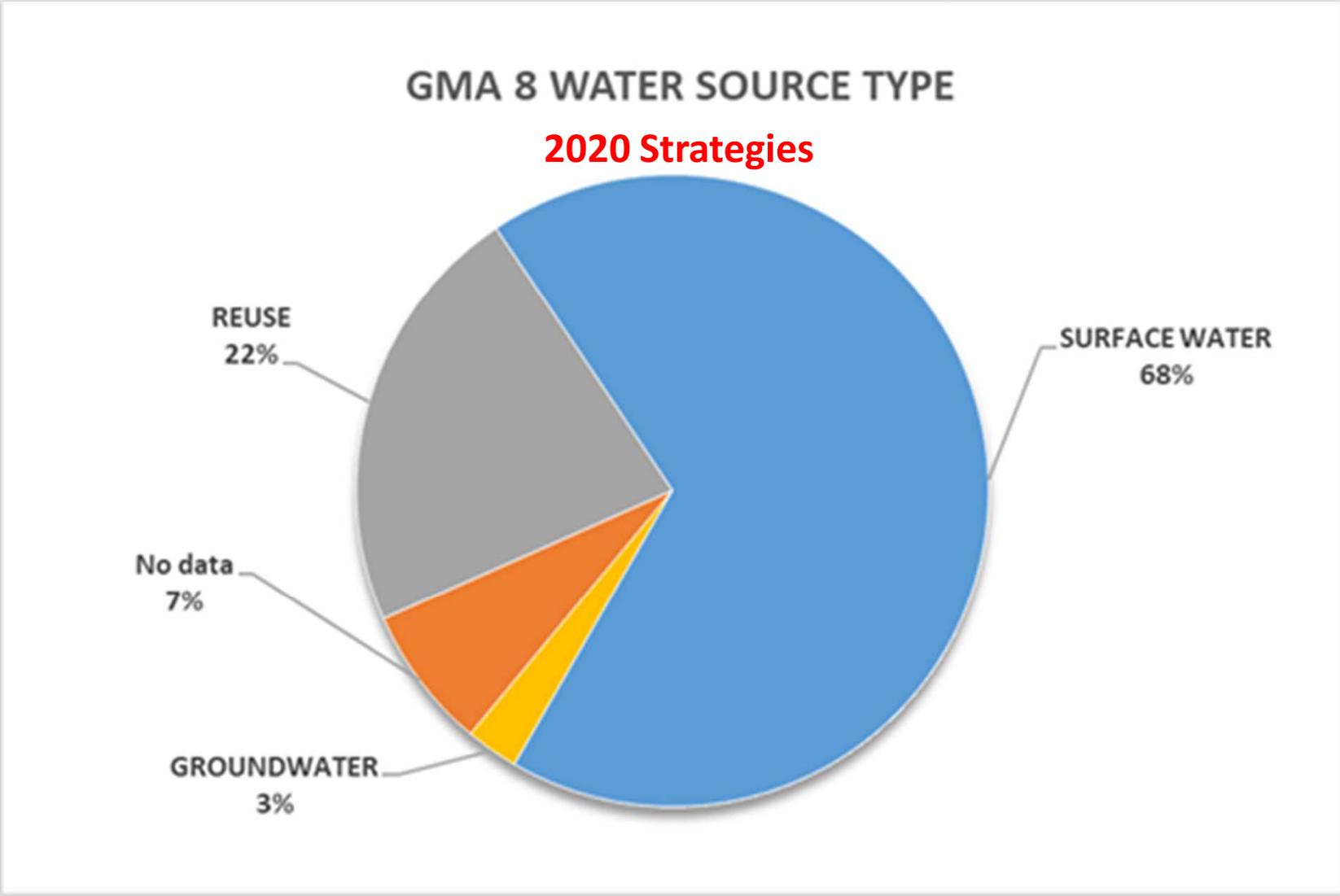


# Supply Needs & Management Strategies

- Taken from 2017 State Water Plan
- Supply Needs
  - Need = Supply is less than Future Demand
  - Need = Current Supply - Future Demands
- Management Strategies
  - Infrastructure strategies to meet needs
  - 2020 and 2050 strategies

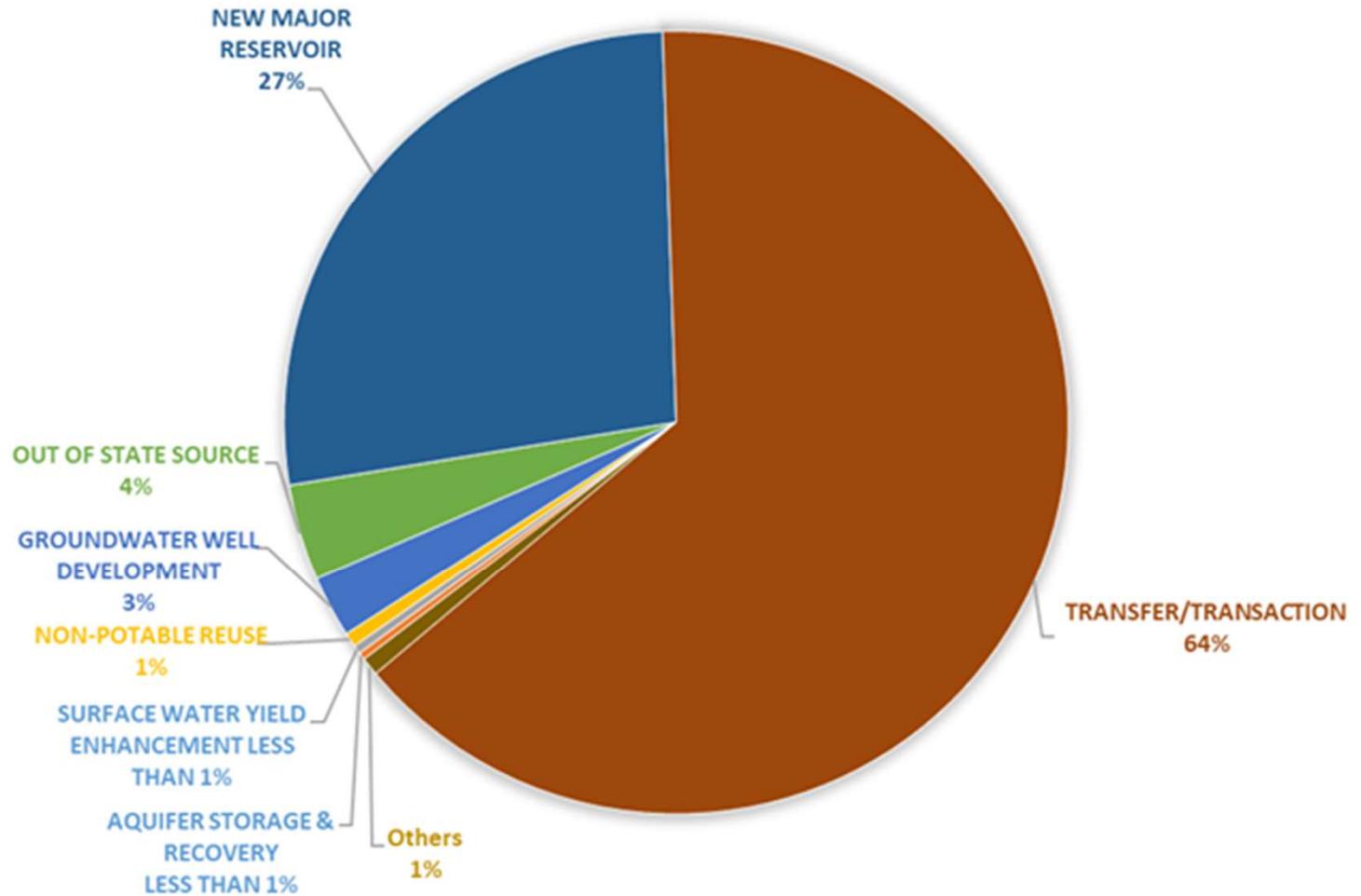
At a glance

# Water Sources for New Strategies in GMA 8



## GMA 8 WATER MANAGEMENT STRATEGY SOURCE DESCRIPTION

### 2020 Strategies

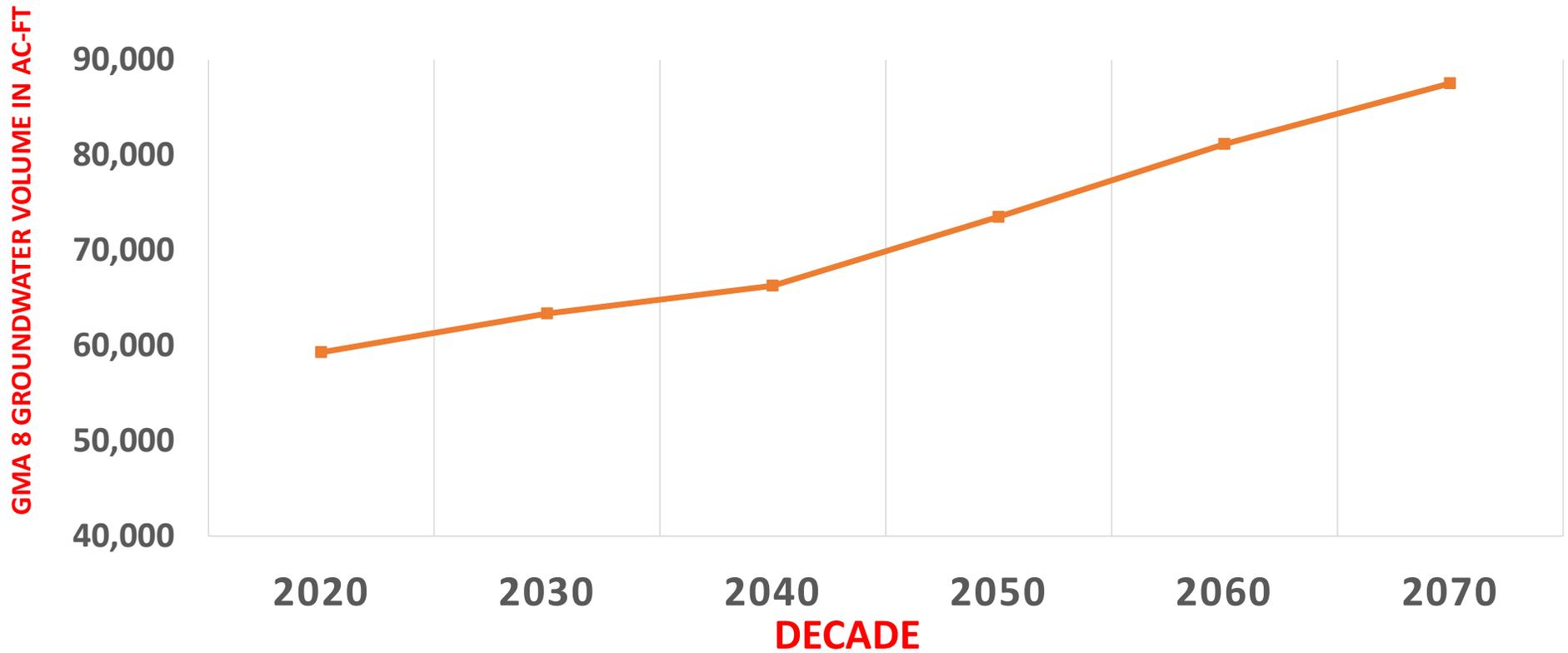


At a glance

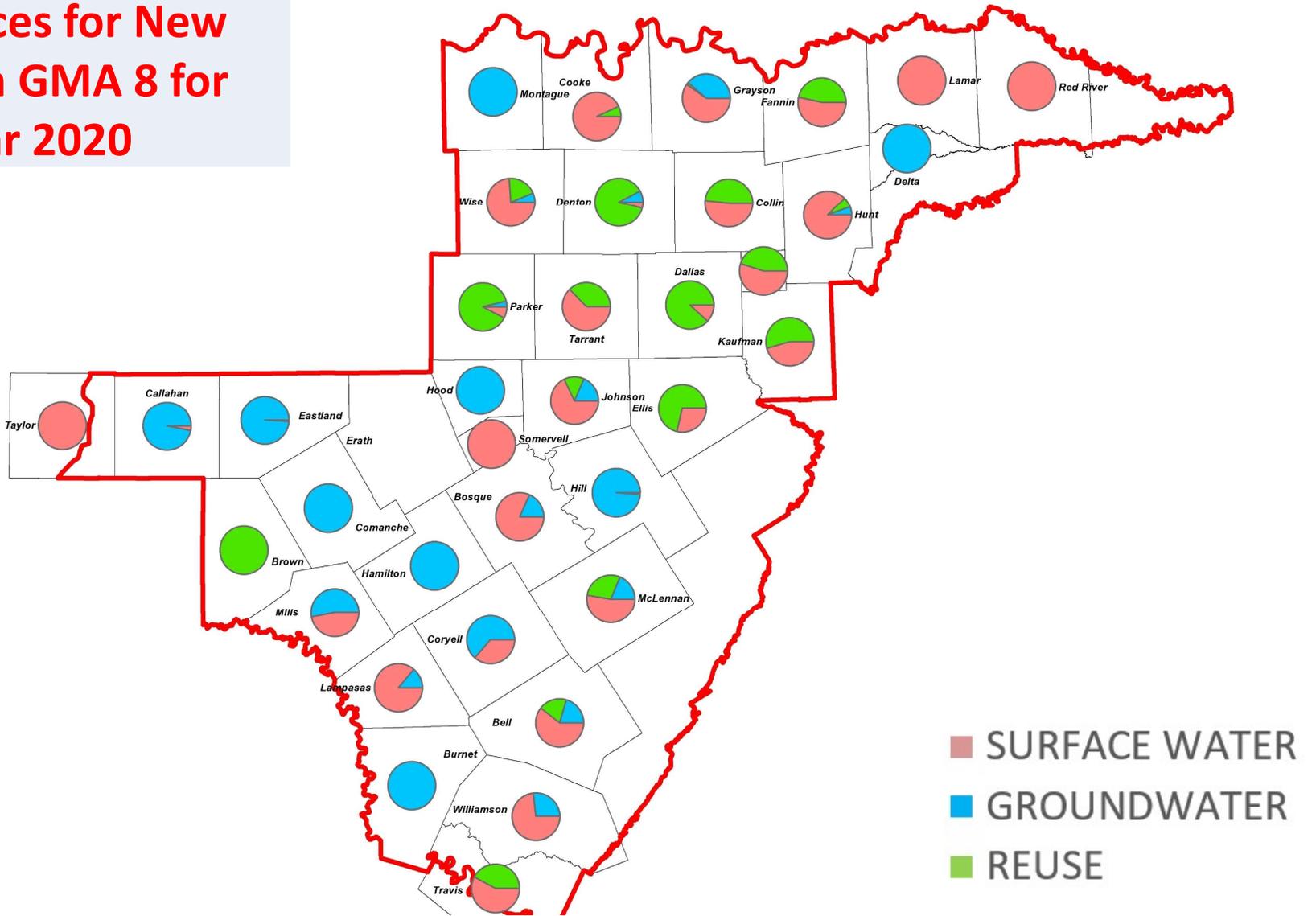
# Sources for New Strategies in GMA 8



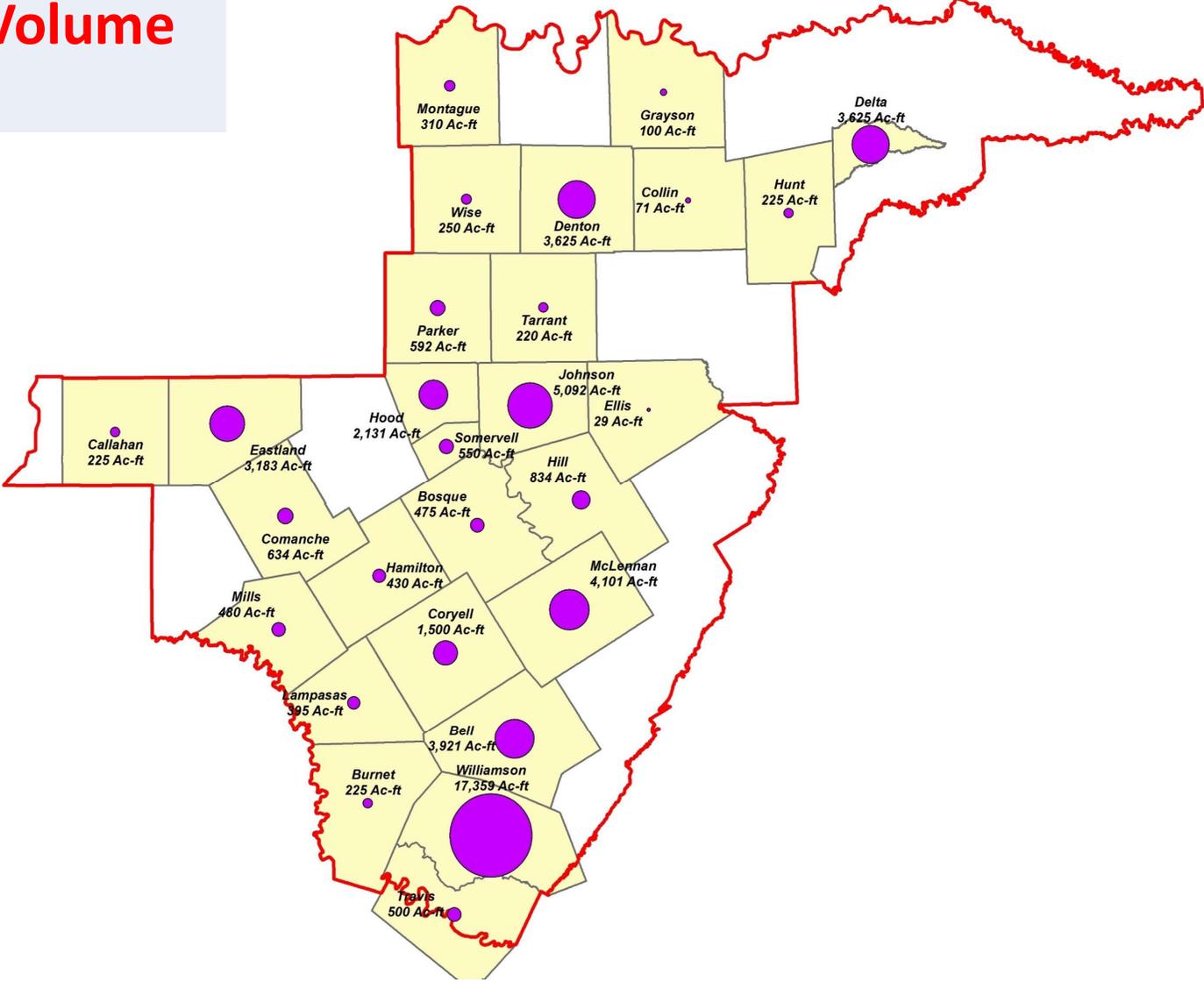
## GMA 8 STRATEGIES GROUNDWATER VOLUME FOR EACH DECADE



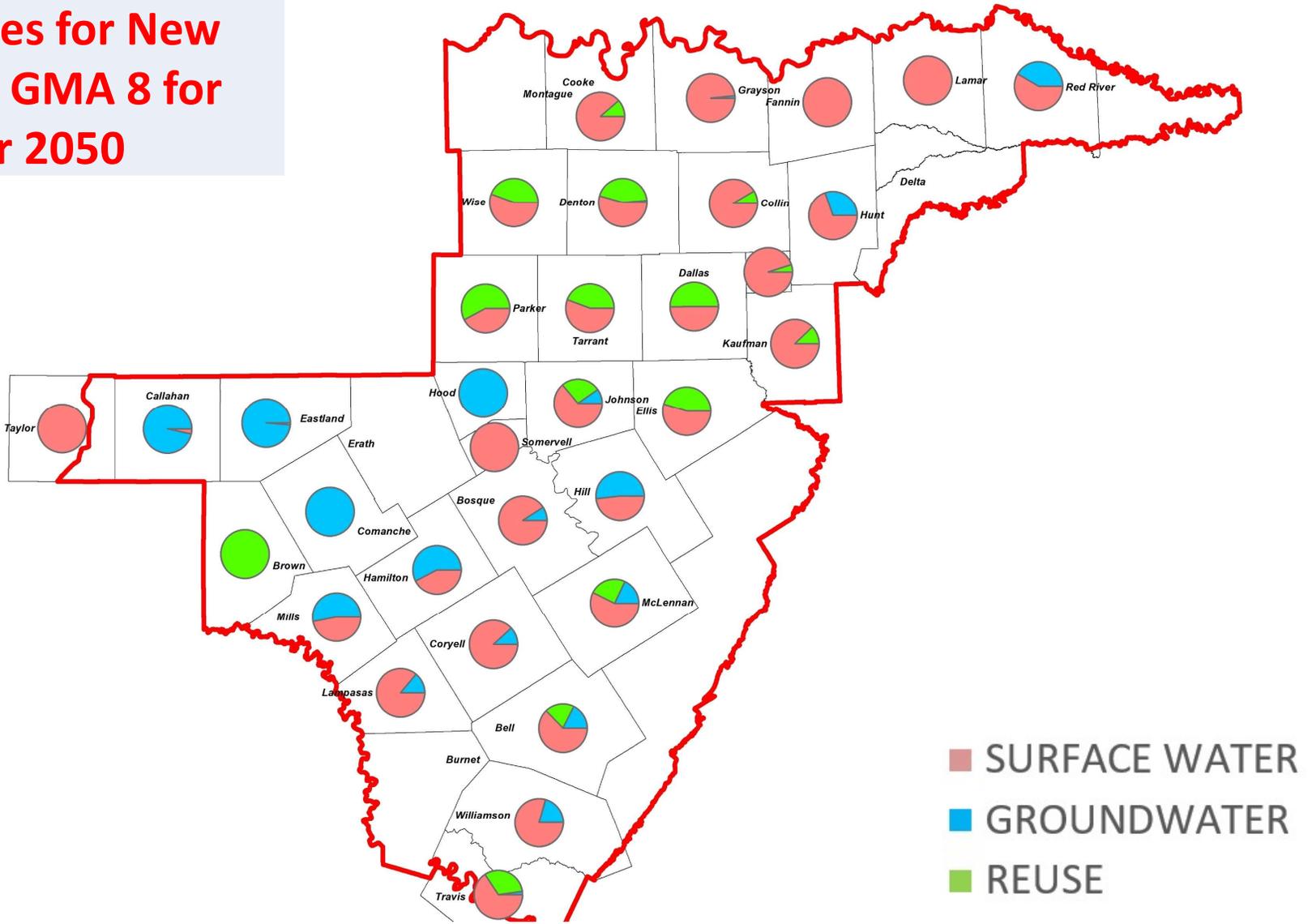
# Water Sources for New Strategies in GMA 8 for the year 2020



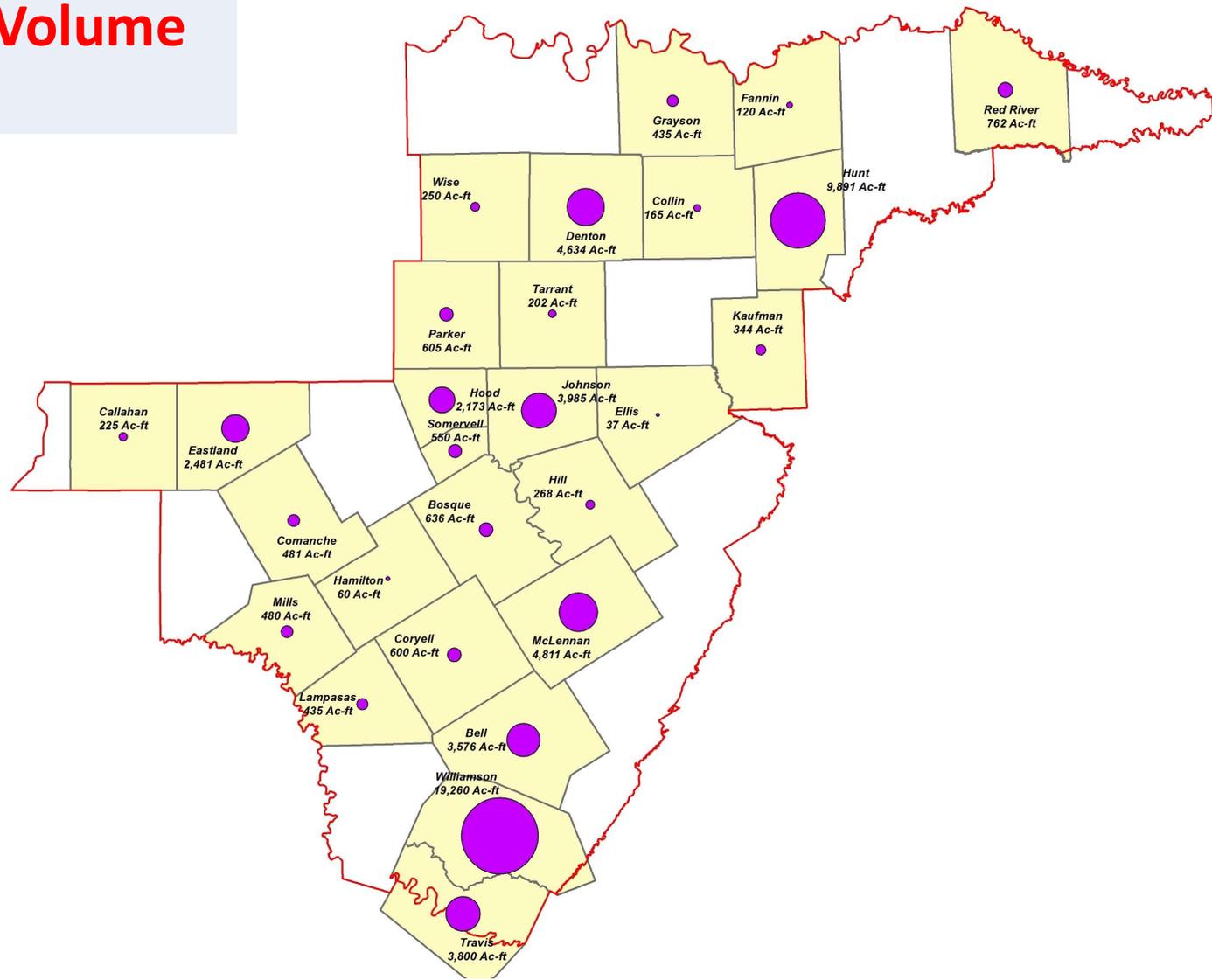
# Groundwater Volume 2020



# Water Sources for New Strategies in GMA 8 for the year 2050



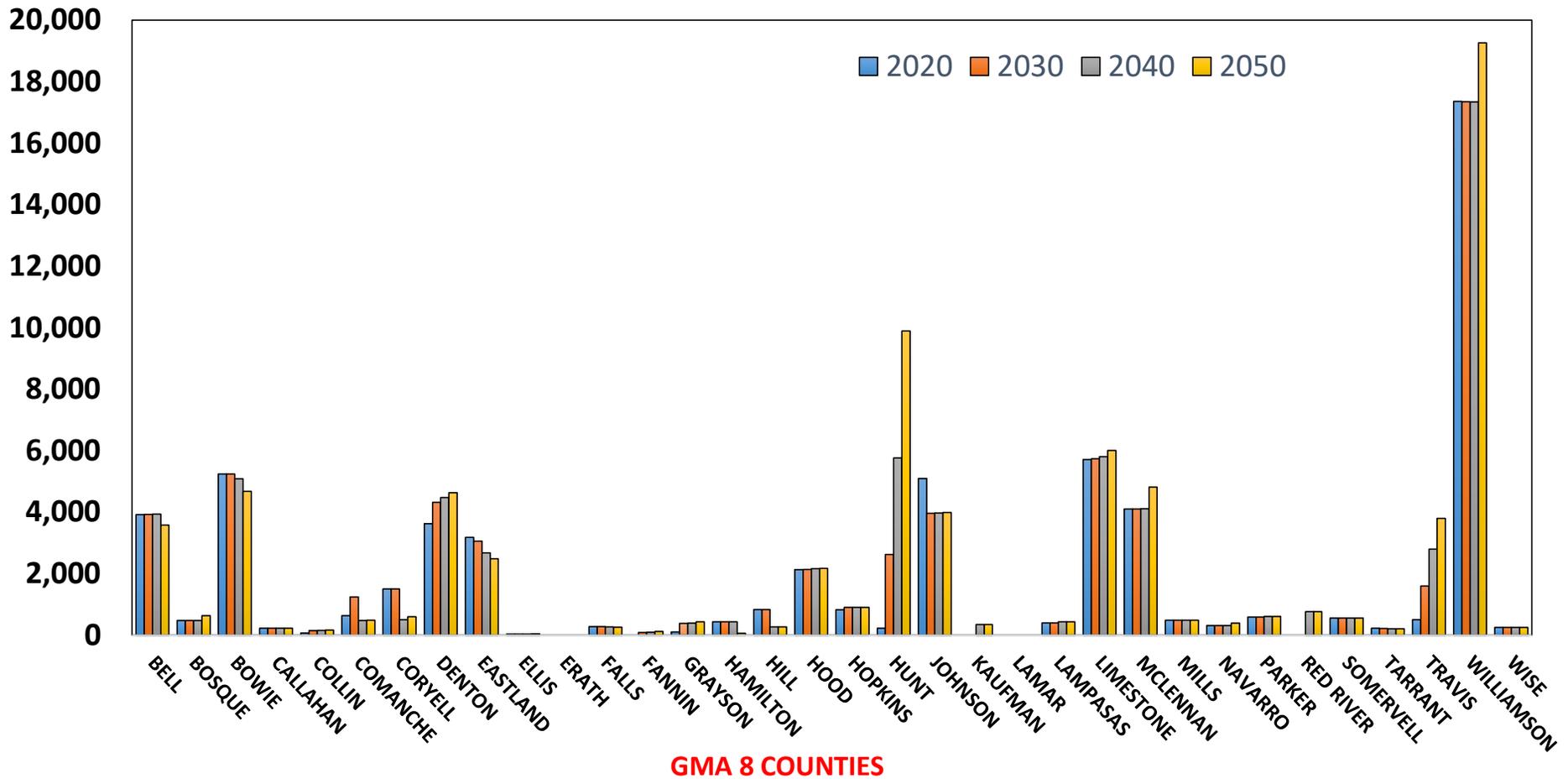
# Groundwater Volume 2050



# GMA 8 GROUNDWATER SOURCE FROM 2020 TO 2050

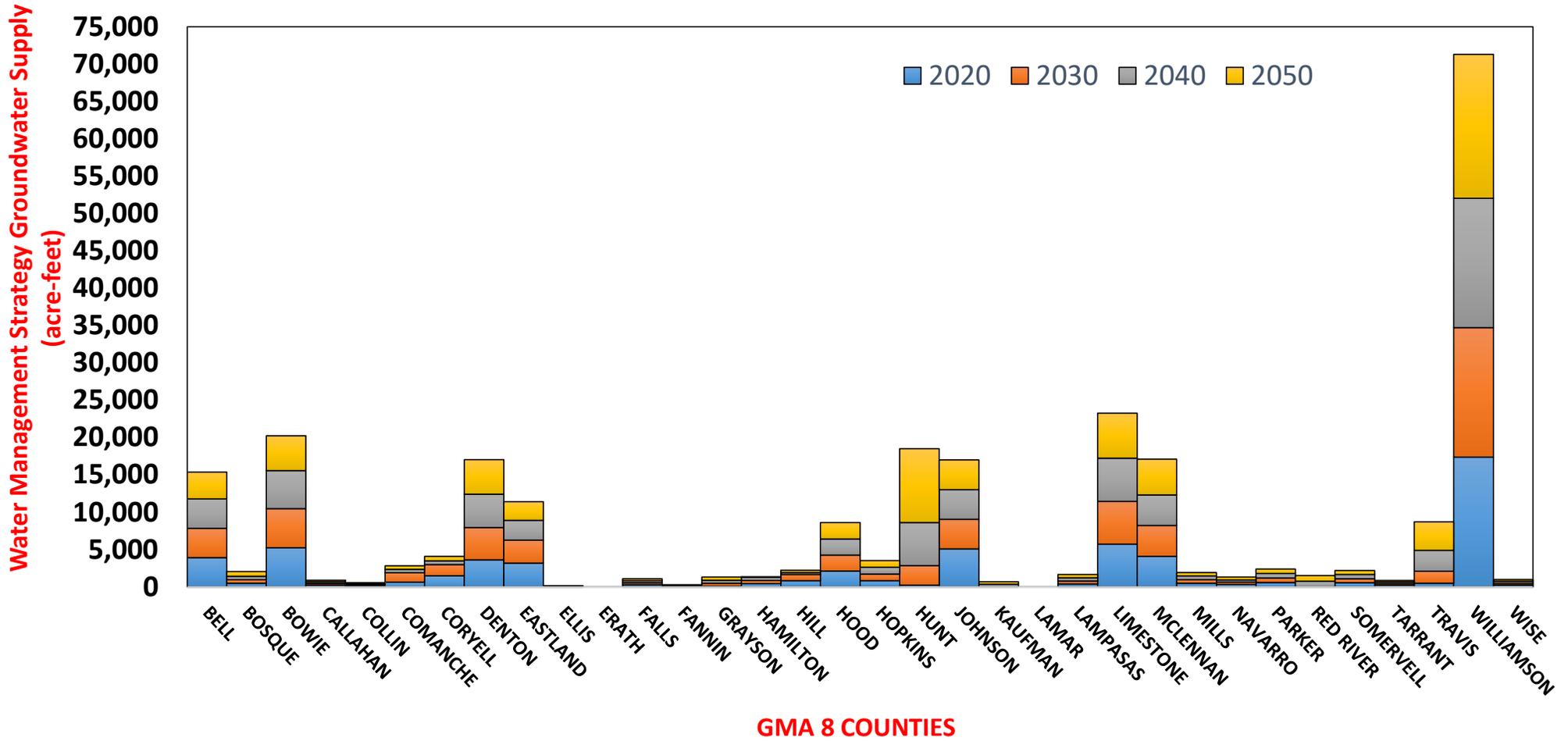
Water Management Strategy Groundwater

Supply  
(acre-feet)

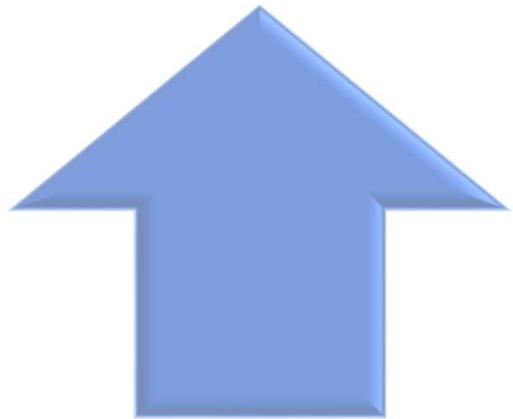


GMA 8 COUNTIES

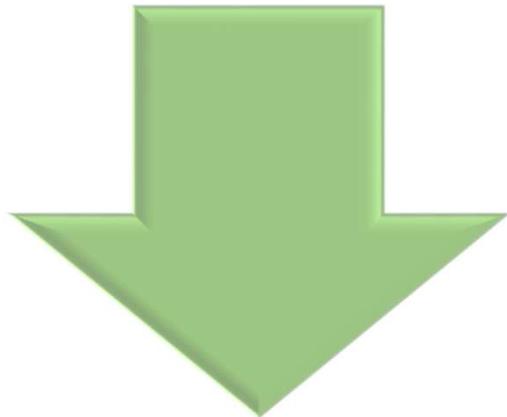
# GMA 8 GROUNDWATER SOURCE FROM 2020 TO 2050



# Standard for Desired Future Conditions



Highest Practicable Level of  
Groundwater Production



Conservation, Preservation,  
Protection, Recharging, and  
Prevention of Waste of  
Groundwater, and Control  
of Subsidence

## Impact on Interests/Rights in Private Property

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### ***Today's Meeting:***

Presentations and discussions regarding Aquifer Uses or Conditions, Supply Needs & Management Strategies, and ***Private Property Rights*** factors as they relate to Desired Future Conditions (DFCs) pursuant to Texas Water Code (TWC) § 36.108(d)

- *Discussion of regulatory compliance and technical/policy summary of factor only; no legal analysis, advice or opinions, and no discussion today should be construed as such*
- *Questions regarding legal implications should be directed to GCD legal counsel for appropriate consultation*

## Impact on Interests/Rights in Private Property

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### ***Private Property Rights Factor Discussion:***

1. Review TWC § 36.108(d) requirements for private property rights factor consideration
2. Review other TWC considerations
3. Review GMA 8 discussions of private property rights factor during second round of DFC joint planning
4. Other considerations regarding private property rights
5. Next steps in GMA 8 private property rights factor consideration
6. GMA 8 discussion of private property rights factor
7. Questions

## Impact on Interests/Rights in Private Property

### Private Property Rights Factor - TWC § 38.108(d) requirements

Before GMA Can Vote on Proposed DFCs, TWC § 36.108(d) requires that:

“(d) Not later than May 1, 2021, and every five years thereafter, the districts shall consider groundwater availability models and other data or information for the management area and shall propose for adoption desired future conditions for the relevant aquifers within the management area. **Before voting on the proposed desired future conditions of the aquifers under Subsection (d-2), the districts shall consider:**

...

**(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; . . .”**

## Impact on Interests/Rights in Private Property

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### **Private Property Rights Factor - TWC § 38.108(d) requirements**

- TWC § 36.002 establishes property owner has vested ownership interest in and right to produce groundwater beneath property.
- TWC § 36.002 does not:
  - 1) Prohibit GCD from limiting or prohibiting landowner from drilling well due to landowner's failure or inability to comply with GCD's well spacing or tract size requirements
  - 2) Affect GCD's ability to regulate groundwater production under TWC sections on permits, well spacing or transfers, or special laws governing GCDs
  - 3) Require GCD rule to allocate to each landowner proportionate share of groundwater available from aquifer based on number of surface acres owned

## Impact on Interests/Rights in Private Property

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### Other TWC Considerations

- TWC § 36.0015(b) establishes purpose of GCDs to manage groundwater resources and affirms as State's preferred method of groundwater management to protect property rights, balance groundwater conservation and development, and use best available science to conserve and develop groundwater through rules.
- TWC § 36.116 gives GCDs authority to regulate well spacing/production.
- GCDs empowered to issue permits and carry out responsibilities consistent with management plans and rules, TWC Chapter 36, and Texas Constitution.
- GCDs continually strike balance between groundwater production to meet current and future needs, while also conserving, preserving and managing resources.
- "Balance Test" is not new to GCDs.

## Impact on Interests/Rights in Private Property

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### **Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions**

- GMA 8 GCDs thoroughly discussed and considered impacts on private property throughout second round.
- Formal discussions of private property rights factor and related issues held during GMA 8 meetings –
  - July 29, 2014
  - May 27, 2015
  - March 23, 2016
  - April 1, 2016
- Each GCD also held discussions to consider impacts of proposed DFCs on private property rights.

## Impact on Interests/Rights in Private Property

### Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- From the GMA 8 *Desired Future Conditions Explanatory Report* (February 2017), GMA 8 representatives identified topics/issues to be considered by each GCD as DFCs developed –
  - Existing uses of groundwater within GCD
  - Projected future uses of groundwater within GCD
  - Investment-backed expectations of existing users and property owners within GCD
  - Long-term viability of groundwater resources in GMA
  - Availability of water to all properties and ability to allocate the modeled available groundwater (MAG) amounts through rules after DFC adoption
  - Whether immediate cutbacks would be required in setting a particular DFC or whether cutbacks, if any, would need to occur over a certain timeframe

## Impact on Interests/Rights in Private Property



### Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 representative identified topics/issues to be considered by each GCD as DFCs developed (continued) –
  - For outcrop areas, how outcrop depletes rapidly in dry times, and whether drought rules or triggers based on the DFC/MAG for outcrop could be beneficial to ensure viability of the resource during dry times
  - Economic consequences to existing users (e.g., cost to drop pumps, reconfigure or drill new wells upon water table dropping, etc.). Also, consider economic consequences of less water available to protect existing users from economic consequences relevant to existing users – reaching a balance between these two dynamics

## Impact on Interests/Rights in Private Property

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### Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 representative identified topics/issues to be considered by each GCD as DFCs developed (continued) –
  - Review sustainability GAM run versus additional GAM runs that provide for more pumping from an aquifer, and how those two differ with respect to private property rights
  - Focus on finding a balance, as defined by each GCD, between all of these considerations

**All of these topics/issues considered by GMA 8 GCDs during the second round of joint planning continue to be relevant considerations in this third round.**

## Impact on Interests/Rights in Private Property

### Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

- GMA 8 survey tool developed and used by each GMA 8 GCD to initiate and document this factor's (and socioeconomic factor's) consideration.
- Ten GMA 8 GCDs discussed proposed DFCs impacts on private property.
- Post-Oak Savannah GCD – Proposed DFCs not applicable to GCD.
- Northern Trinity GCD – Did not discuss how proposed DFCs may impact ability of existing well owners and property owners who have yet to drill a well.
- All completed surveys provided documentation of multiple meeting dates where this factor was discussed at length by each GCD's board of directors.
- Some completed surveys included supporting documentation/reports.
- All remaining GCD responses to the survey were affirmative as summarized in Table 24 of the GMA 8 *Desired Future Conditions Explanatory Report* (February 2017).

# Impact on Interests/Rights in Private Property

## Private Property Rights Factor - GMA 8 DFC Joint Planning Second Round Discussions

Table 24. Summary of GMA 8 Survey regarding impacts of proposed DFCs on private property rights.

GMA 8 Survey questions regarding impacts of proposed DFCs on private property rights	GMA 8 GCD Survey Responses										
	CTGCD	CUWCD	MTGCD	NTGCD	Ntrinity GCD	POSGCD	PGCD	RRGCD	SUWCD	STGCD	UTGCD
Did your GCD discuss and consider the impacts of proposed DFC options on interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may impact the ability of both: (1) existing well owners, and (2) property owners who have not yet drilled a well but may have an expectation of being able to do so in the future, to recover their investment-backed expectations from their investments in their water wells and their investments in their properties?	Y	Y	Y	Y	N	NA	Y	Y	Y	Y	Y
Did your GCD discuss how proposed DFCs may impact the availability of water to all properties overlying the aquifer in your district, and whether property owners of various economic means will be able to complete affordable water wells with sufficient well yields for projected uses, or whether affordable water from alternative water supplies would be available to those properties?	Y	Y	Y	Y	Y	NA	Y	Y	Y	Y	Y

## Impact on Interests/Rights in Private Property

### **Other Considerations Regarding Private Property Rights**

#### ***GMA and GCD Continuing DFC and Annual Joint Planning Efforts***

- DFC process is “iterative.”
- Through annual joint planning, GCDs can discuss new or emerging issues that may involve reevaluating, revising, and/or reconsidering DFCs.
- GCDs propose DFCs no later than every five years; meet to consider DFCs at least annually to collectively respond to changed circumstances, consider potential impacts to factors, and make adaptive management adjustments to either DFCs or MAGs.
- Process can be costly and time-consuming for GCDs.
- GCDs actively engaged in management activities and programs to carry out statutory mission and manage aquifers.

## Impact on Interests/Rights in Private Property

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### **Other Considerations Regarding Private Property Rights**

#### ***GMA and GCD Continuing DFC and Annual Joint Planning Efforts (continued)***

- GCDs implement various management strategies to address aquifer management issues to identify ways to improve and share resources.
- Statutes are flexible to develop locally-responsive management programs and management strategies and incentives - management zones, water conservation, reuse and rainwater harvesting - further reduce demand, help achieve DFCs, and consider potential impacts.

## Impact on Interests/Rights in Private Property

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### **Next Steps in GMA 8 Private Property Rights Factor Consideration**

- Are GMA 8 Survey results regarding impacts of proposed DFCs on private property rights still reflective of today's issues?
- Once actual DFCs are being considered and reviewed relative to the nine factors, WSP Team to develop presentation of impacts of proposed DFCs on nine factors.
- Information from presentations to be incorporated into the GMA 8 Desired Future Conditions Explanatory Report.

## Impact on Interests/Rights in Private Property

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**Questions?**

## Agenda Item 12

### Discussion of possible agenda items and dates for next GMA 8 meeting

- *Presentation of Central Texas GCD run results for Llano Uplift aquifers*
- *Discussion of final 3 of 9 factors (Socioeconomic, Feasibility, and other)*
- *Discussion and possible action on DFCs for:*
  - Trinity
  - Woodbine
  - Edwards
  - Llano Uplift Aquifer (Hickory, Ellenburger, and Marble Falls)
- *Discussion and possible action on designation of Non-Relevant Aquifers*

# GMA 8 Schedule to Discuss Nine Factors

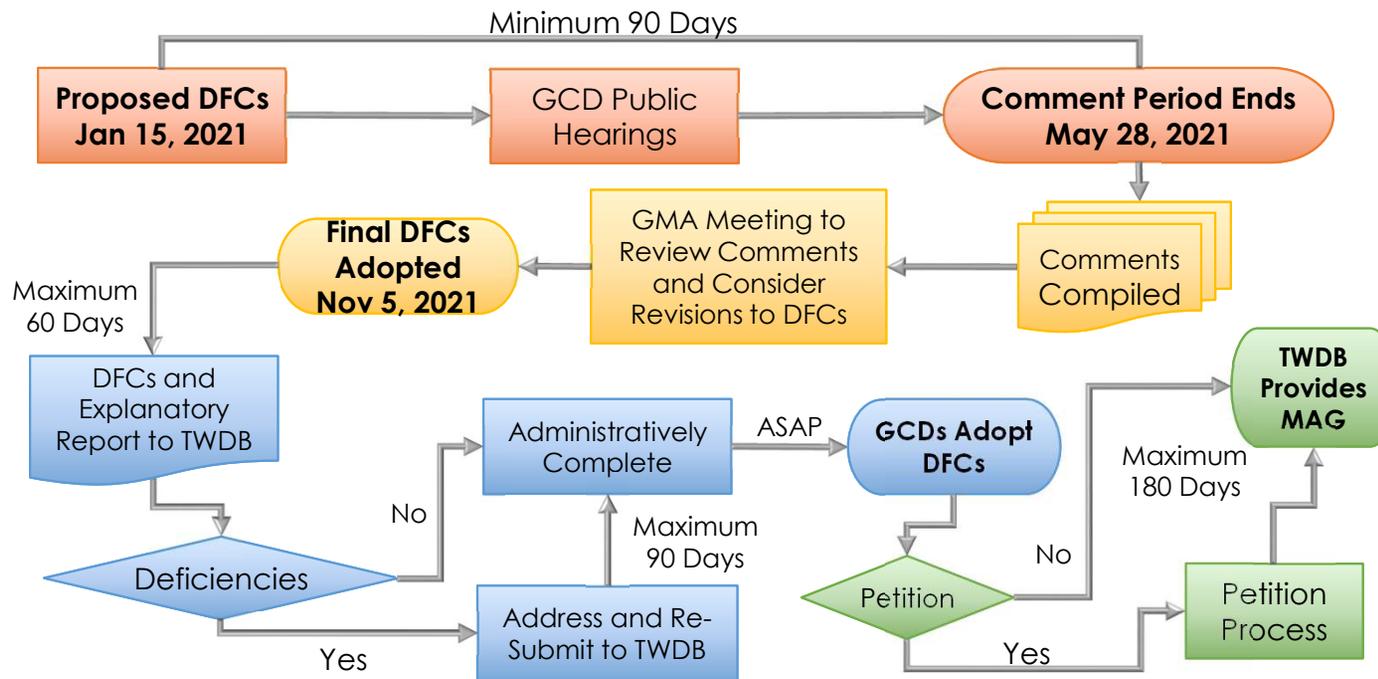
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Environmental Impacts	Subsidence Impacts	Hydrological Conditions
February 2020		
Aquifer Uses or Conditions	Supply Needs & Management Strategies	Private Property Rights
May 2020		
Socioeconomic Impacts	DFC Feasibility	Other Relevant Information

Thank you!

*wsp.com*

wsp

# Anticipated Timeline for GMA 8 DFC Process



# DFC Process (TWC Sec. 36.108 & 31 TAC Ch. 356)

