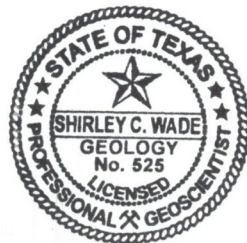

**GAM RUN 21-019 MAG:
MODELED AVAILABLE GROUNDWATER FOR
THE GULF COAST AQUIFER SYSTEM IN
GROUNDWATER MANAGEMENT AREA 14**

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
512-936-0883
September 8, 2022



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10/6/2022

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EXECUTIVE SUMMARY:

The combined value of modeled available groundwater in Groundwater Management Area 14 and the projected groundwater pumpage in subsidence districts in Groundwater Management Area 14 for the Gulf Coast Aquifer System ranges from a maximum of 1,327,135 acre-feet per year in 2020 to a minimum of 1,107,263 acre-feet per year in 2040 (Tables 1 and 2). Table 1 presents the modeled available groundwater summarized by decade from 2020 to 2080 for groundwater conservation districts. Table 2 presents the projected groundwater pumpage in regulatory plans adopted by subsidence districts and factored into the development of desired future conditions adopted by groundwater conservation districts. Table 3 summarizes the modeled available groundwater (for groundwater conservation district and non-district counties) and the projected groundwater pumpage (for subsidence district counties) by decade from 2030 to 2080 and by county, regional water planning area, and river basin for use in the regional water planning process. The estimates are based on the desired future conditions for the Gulf Coast Aquifer System adopted by groundwater conservation districts in Groundwater Management Area 14 on January 5, 2022. The explanatory report and other materials submitted to the Texas Water Development Board (TWDB) were determined to be administratively complete on June 15, 2022.

REQUESTOR:

Mr. John Martin, chair and technical coordinator of Groundwater Management Area 14.

DESCRIPTION OF REQUEST:

Mr. John Martin provided the TWDB with the desired future conditions of the Gulf Coast Aquifer System on behalf of Groundwater Management Area (GMA) 14. These desired future conditions were adopted by the groundwater conservation districts in Groundwater

Management Area 14 on January 5, 2022. The desired future conditions, as described in Resolution 2021-10-5 (GMA 14 and Oliver, 2022; Appendix G) are:

- “In each county in GMA 14, no less than 70 percent median available drawdown remaining in 2080 or no more than an average of 1.0 additional foot of subsidence between 2009 and 2080.”

The Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson, and Brazos River Alluvium aquifers were declared not relevant for purposes of joint planning by Groundwater Management Area 14 in Resolution 2021-10-5 (GMA 14 and Oliver, 2022; Appendix G).

On March 4, 2022, Mr. John Martin, technical coordinator of Groundwater Management Area 14, submitted the desired future conditions packet for Groundwater Management Area 14. TWDB staff reviewed the model files associated with the desired future conditions and received clarification on assumptions from the Groundwater Management Area 14 technical coordinator on March 23, 2022. In Resolution 2021-10-5, the desired future condition is defined for “each county in GMA 14”; however, Groundwater Management Area 14 clarified that it is their intent per pages 15 and 38 of the explanatory report that the subsidence district counties are not to be included in the county-specific desired future condition definition. For this reason, the TWDB did not consider subsidence district counties during the desired future conditions evaluation. An additional clarification from Groundwater Management Area 14 was a request that the modeled available groundwater values and modeled pumping values be provided by model aquifer layer in addition to the total values for the entire Gulf Coast Aquifer System. These additional splits are included in the current report in Appendix A.

Harris, Galveston, and Fort Bend counties (Subsidence Districts)

Harris-Galveston Subsidence District and Fort Bend Subsidence District are not subject to the provisions of Section 36.108 of the Texas Water Code and, therefore, have not specified desired future conditions. Because desired future conditions were not adopted for the counties in the subsidence districts, the TWDB does not provide “modeled available groundwater” values for those counties. However, the districts in Groundwater Management Area 14 incorporated the groundwater pumpage projections made by the subsidence districts in their regulatory plans so that all known regional groundwater pumping was factored into the joint planning process. Therefore, the subsidence district “groundwater pumpage projections” are still provided in this report (Table 2 and Table 3) even though these values are not official “modeled available groundwater” values.

METHODS:

The TWDB ran the groundwater availability model (version 3.01; Kasmarek, 2013) for the northern part of the Gulf Coast Aquifer System (Figure 1) using the predictive model files

submitted with the explanatory report (GMA 14 and Oliver, 2022; Appendix R) on March 4, 2022. The modeled available groundwater values were determined by extracting pumping rates by decade from the model results using ZONEBUDGET Version 3.01 (Harbaugh, 2009). Annual pumping rates were divided by county, river basin, regional water planning area, and groundwater conservation district within Groundwater Management Area 14 (Figures 1 and 2; Tables 1 through 3).

As part of the process to calculate modeled available groundwater, the TWDB checked the model files submitted by Groundwater Management Area 14 to determine if the groundwater pumping scenario was compatible with the adopted desired future conditions. The TWDB used these model files to extract model-calculated water levels for 2009 (stress period 78) and 2080 (stress period 149), and to calculate the available drawdown according to the methodology described in the explanatory report (GMA 14 and Oliver, 2022; Appendix R). The TWDB applied this methodology to a dataset submitted as part of the explanatory report, which contained well locations and well depths for 61,880 wells. The ratio of available drawdown in 2080 to available drawdown in 2009 was calculated for each well and the median was determined for each county. As specified in the explanatory report (GMA 14 and Oliver, 2022; Appendix R), if the water level in a model cell dropped below the base of the cell the available drawdown for wells located in that model cell was set to zero.

The subsidence values were also extracted from the model results for 2009 (stress period 78) and 2080 (stress period 149) and average change in subsidence was calculated for each county. The median percent available drawdown and average change in subsidence for each county were compared to the desired future conditions to confirm that the model scenario was compatible with the desired future conditions.

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code (2011), “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the modeled available groundwater estimates are described below:

- Version 3.01 of the groundwater availability model for the northern portion of the Gulf Coast Aquifer System was used for this analysis. See Kasmarek (2013) for assumptions and limitations of the model.
- The model has four layers which represent the Chicot aquifer (Layer 1), the Evangeline aquifer (Layer 2), the Burkeville Confining Unit (Layer 3), and the Jasper aquifer and parts of the Catahoula Formation in direct hydrologic communication with the Jasper aquifer (Layer 4).
- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).
- Available drawdown for cells with water levels below the base elevation of the cell (“dry” cells) was set to zero for the analysis.
- Cells with water levels below the base are “dry” in terms of water level. However, the transmissivity of those cells remains constant and pumping from those cells continues. Therefore, pumping is included in the modeled available groundwater values for those cells.
- The subsidence district counties (Harris, Galveston, and Fort Bend) were not included in the evaluation of the desired future condition.
- The evaluation of the desired future condition for available drawdown was based on the 61,880 observation well locations and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The evaluation of the desired future condition for subsidence was based on the extent of the official TWDB boundary for the Gulf Coast Aquifer System within the groundwater model and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The calculation of modeled available groundwater values was based on the extent of the official TWDB boundary for the Gulf Coast Aquifer System within the groundwater model and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The most recent TWDB model grid file dated June 10, 2020 (glfc_n_01062020.csv), was used to determine model cell entity assignment (county, groundwater management area, groundwater conservation district, river basin, regional water planning area).

- Estimates of modeled available groundwater from the model simulation were rounded to the nearest whole number.

RESULTS:

The modeled available groundwater for the Gulf Coast Aquifer System that achieves the desired future conditions adopted by Groundwater Management Area 14 ranges from 781,781 to 781,753 acre-feet per year between 2020 and 2080 (Table 1). Projected Gulf Coast Aquifer System groundwater pumpage from the three counties in the Harris Galveston Subsidence District and Fort Bend Subsidence District ranges between 545,354 and 325,510 acre-feet per year during the period 2020 to 2080 (Table 2). The combination of modeled available groundwater and projected groundwater pumpage values in the Gulf Coast Aquifer System has also been summarized by county, river basin, and regional water planning area in order to be consistent with the format used in the regional water planning process. (Table 3).

The modeled available groundwater values and projected groundwater pumpage values are also tabulated by model aquifer layer in Appendix A.

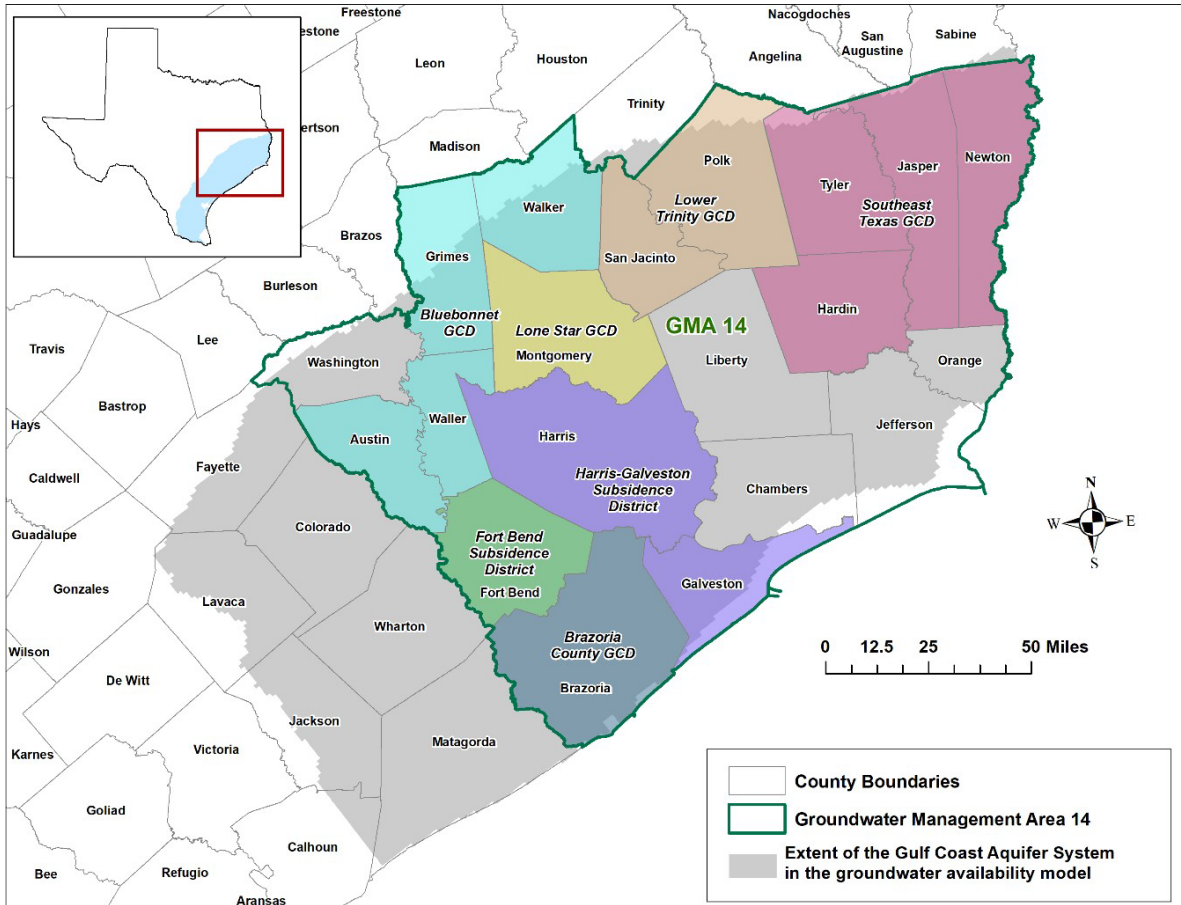


FIGURE 1. THE EXTENT OF THE GULF COAST AQUIFER SHOWN WITH GROUNDWATER CONSERVATION DISTRICTS AND SUBSIDENCE DISTRICTS IN GROUNDWATER MANAGEMENT AREA 14.

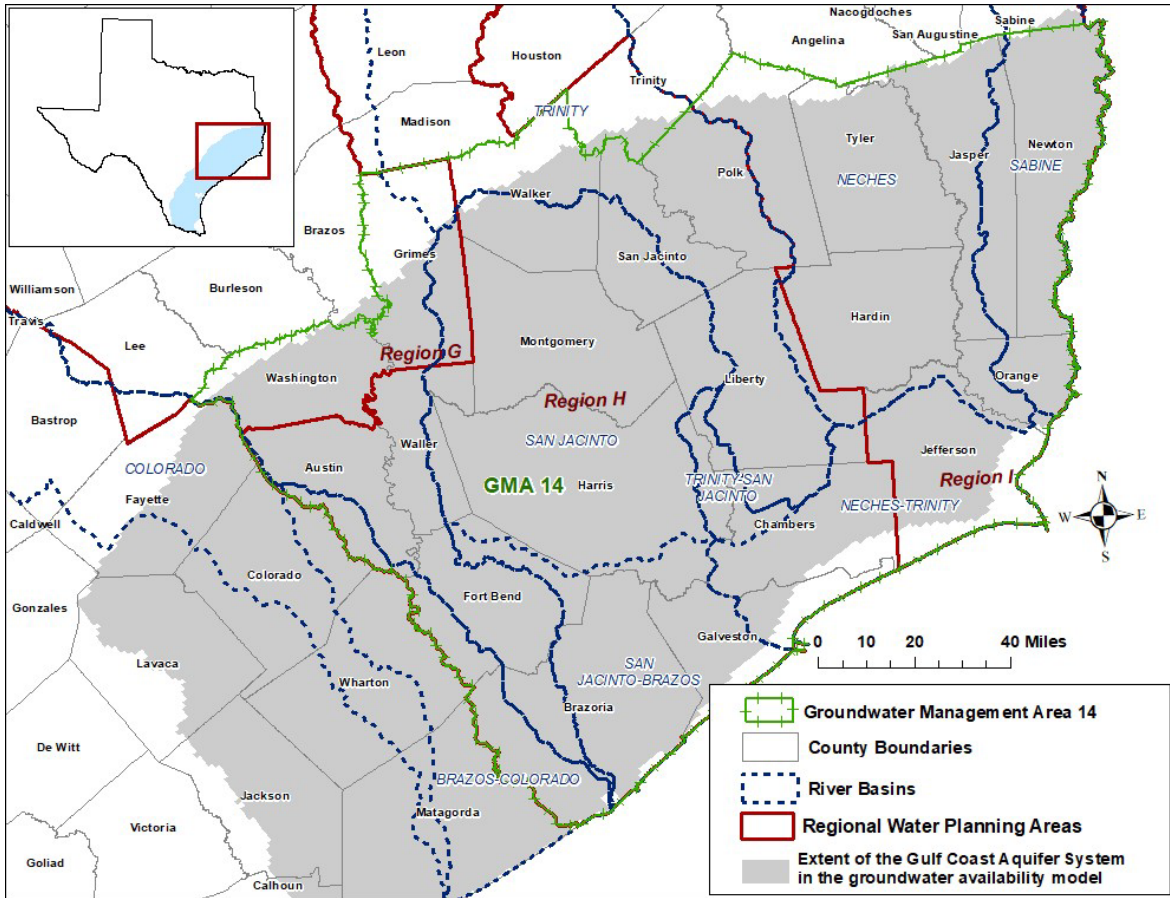


FIGURE 2. LOCATION OF REGIONAL WATER PLANNING AREAS AND RIVER BASINS IN GROUNDWATER MANAGEMENT AREA 14.

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES EXCLUDE SUBSIDENCE DISTRICTS. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Bluebonnet GCD	Austin	Gulf Coast Aquifer	46,560	46,560	46,560	46,560	46,560	46,560	46,560
Bluebonnet GCD	Grimes	Gulf Coast Aquifer	51,487	51,487	51,487	51,487	51,487	51,487	51,487
Bluebonnet GCD	Walker	Gulf Coast Aquifer	42,504	42,504	42,504	42,504	42,504	42,504	42,504
Bluebonnet GCD	Waller	Gulf Coast Aquifer	55,533	55,533	55,533	55,533	55,533	55,533	55,533
Bluebonnet GCD Total		Gulf Coast Aquifer System	196,084	196,084	196,084	196,084	196,084	196,084	196,084
Brazoria County	Brazoria	Gulf Coast Aquifer	54,955	54,930	54,908	54,895	54,888	54,886	54,886
Brazoria County GCD Total		Gulf Coast Aquifer System	54,955	54,930	54,908	54,895	54,888	54,886	54,886
Lone Star GCD	Montgomery	Gulf Coast Aquifer	96,965	96,954	96,945	96,930	96,916	96,873	96,873
Lone Star GCD Total		Gulf Coast Aquifer System	96,965	96,954	96,945	96,930	96,916	96,873	96,873
Lower Trinity GCD	Polk	Gulf Coast Aquifer	40,746	40,746	40,746	40,746	40,746	40,746	40,746
Lower Trinity GCD	San Jacinto	Gulf Coast Aquifer	35,037	35,048	35,057	35,071	35,086	35,128	35,128
Lower Trinity GCD Total		Gulf Coast Aquifer System	75,783	75,794	75,803	75,817	75,832	75,874	75,874

TABLE 1 (CONTINUED). MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES EXCLUDE SUBSIDENCE DISTRICTS. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Southeast Texas	Hardin	Gulf Coast Aquifer System	37,721	37,721	37,721	37,721	37,721	37,721	37,721
Southeast Texas	Jasper	Gulf Coast Aquifer System	73,365	73,365	73,365	73,365	73,365	73,365	73,365
Southeast Texas	Newton	Gulf Coast Aquifer System	37,508	37,508	37,508	37,508	37,508	37,508	37,508
Southeast Texas	Tyler	Gulf Coast Aquifer System	34,390	34,390	34,390	34,390	34,390	34,390	34,390
Southeast Texas GCD Total		Gulf Coast Aquifer System	182,984	182,984	182,984	182,984	182,984	182,984	182,984
All District Total		Gulf Coast Aquifer System	606,771	606,746	606,724	606,710	606,704	606,701	606,701
No District-County	Chambers	Gulf Coast Aquifer System	22,321	22,332	22,343	22,352	22,353	22,355	22,355
No District-County	Jefferson	Gulf Coast Aquifer System	15,425	15,425	15,425	15,425	15,425	15,425	15,425
No District-County	Liberty	Gulf Coast Aquifer System	71,661	71,660	71,658	71,659	71,660	71,660	71,660
No District-County	Orange	Gulf Coast Aquifer System	25,205	25,205	25,205	25,205	25,205	25,205	25,205
No District-County	Washington	Gulf Coast Aquifer System	40,398	40,398	40,398	40,398	40,398	40,398	40,398
No District Total		Gulf Coast Aquifer System	175,010	175,020	175,029	175,039	175,041	175,043	175,043
GMA 14	Total	Gulf Coast Aquifer System	781,781	781,766	781,753	781,749	781,745	781,744	781,744

TABLE 2. GROUNDWATER PUMPAGE PROJECTIONS FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 FOR SUBSIDENCE DISTRICT COUNTIES FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Subsidence District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Fort Bend	Fort Bend	Gulf Coast Aquifer System	129,845	103,942	119,557	135,158	151,334	169,347	169,347
Fort Bend Subsidence District Total		Gulf Coast Aquifer System	129,845	103,942	119,557	135,158	151,334	169,347	169,347
Harris-Galveston	Galveston	Gulf Coast Aquifer System	6,032	6,788	7,435	8,060	8,646	9,181	9,181
Harris-Galveston	Harris	Gulf Coast Aquifer System	409,477	290,583	198,518	211,370	220,049	228,828	228,828
Harris-Galveston Subsidence District Total		Gulf Coast Aquifer System	415,509	297,371	205,953	219,430	228,695	238,009	238,009
GMA 14	Total	Gulf Coast Aquifer System	545,354	401,313	325,510	354,588	380,029	407,356	407,356

TABLE 3. MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Austin	H	Brazos-Colorado	Gulf Coast	20,652	20,652	20,652	20,652	20,652	20,652
Austin	H	Brazos	Gulf Coast	25,243	25,243	25,243	25,243	25,243	25,243
Austin	H	Colorado	Gulf Coast	665	665	665	665	665	665
Brazoria	H	Brazos-Colorado	Gulf Coast	10,049	9,846	9,582	9,324	9,072	9,072
Brazoria	H	Brazos	Gulf Coast	3,641	3,578	3,510	3,454	3,407	3,407
Brazoria	H	San Jacinto-Brazos	Gulf Coast	41,240	41,483	41,803	42,110	42,408	42,408
Chambers	H	Neches-Trinity	Gulf Coast	9,968	9,968	9,968	9,968	9,968	9,968
Chambers	H	Trinity-San Jacinto	Gulf Coast	2,142	2,152	2,161	2,163	2,164	2,164
Chambers	H	Trinity	Gulf Coast	10,222	10,222	10,222	10,222	10,222	10,222
<i>Fort Bend</i>	<i>H</i>	<i>Brazos-Colorado</i>	<i>Gulf Coast</i>	<i>7,891</i>	<i>9,586</i>	<i>12,056</i>	<i>15,660</i>	<i>20,927</i>	<i>20,927</i>
<i>Fort Bend</i>	<i>H</i>	<i>Brazos</i>	<i>Gulf Coast</i>	<i>37,845</i>	<i>46,525</i>	<i>55,134</i>	<i>64,011</i>	<i>73,732</i>	<i>73,732</i>
<i>Fort Bend</i>	<i>H</i>	<i>San Jacinto-Brazos</i>	<i>Gulf Coast</i>	<i>40,844</i>	<i>45,913</i>	<i>50,471</i>	<i>54,218</i>	<i>57,258</i>	<i>57,258</i>
<i>Fort Bend</i>	<i>H</i>	<i>San Jacinto</i>	<i>Gulf Coast</i>	<i>17,362</i>	<i>17,532</i>	<i>17,497</i>	<i>17,445</i>	<i>17,430</i>	<i>17,430</i>
<i>Galveston</i>	<i>H</i>	<i>Neches-Trinity</i>	<i>Gulf Coast</i>	<i>0¹</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Galveston</i>	<i>H</i>	<i>San Jacinto-Brazos</i>	<i>Gulf Coast</i>	<i>6,788</i>	<i>7,435</i>	<i>8,060</i>	<i>8,646</i>	<i>9,181</i>	<i>9,181</i>
Grimes	G	Brazos	Gulf Coast	31,117	31,117	31,117	31,117	31,117	31,117
Grimes	G	San Jacinto	Gulf Coast	19,087	19,087	19,087	19,087	19,087	19,087
Grimes	G	Trinity	Gulf Coast	1,283	1,283	1,283	1,283	1,283	1,283
Hardin	I	Neches	Gulf Coast	37,571	37,571	37,571	37,571	37,571	37,571
Hardin	I	Trinity	Gulf Coast	150	150	150	150	150	150
<i>Harris</i>	<i>H</i>	<i>San Jacinto-Brazos</i>	<i>Gulf Coast</i>	<i>6,956</i>	<i>7,617</i>	<i>8,282</i>	<i>8,819</i>	<i>9,463</i>	<i>9,463</i>
<i>Harris</i>	<i>H</i>	<i>San Jacinto</i>	<i>Gulf Coast</i>	<i>280,676</i>	<i>187,992</i>	<i>199,990</i>	<i>208,033</i>	<i>216,067</i>	<i>216,067</i>

¹ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE 3 (CONTINUED). MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Waller	H	Brazos	Gulf Coast	23,397	23,397	23,397	23,397	23,397	23,397
Waller	H	San Jacinto	Gulf Coast	32,136	32,136	32,136	32,136	32,136	32,136
Washington	G	Brazos	Gulf Coast	40,164	40,164	40,164	40,164	40,164	40,164
Washington	G	Colorado	Gulf Coast	233	233	233	233	233	233
GMA 14 Total			Gulf Coast Aquifer System	1,183,076	1,107,256	1,136,332	1,161,772	1,189,096	1,189,096

LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

“Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results.”

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and groundwater levels in the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

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APPENDIX A

Total Pumping Associated with Modeled Available Groundwater Run for the Gulf Coast Aquifer System Split by Model Layers for Groundwater Management Area 14

TABLE A.1. MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER AND SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Bluebonnet GCD	Austin	Chicot aquifer	2,894	2,894	2,894	2,894	2,894	2,894	2,894
Bluebonnet GCD	Austin	Evangeline aquifer	41,695	41,695	41,695	41,695	41,695	41,695	41,695
Bluebonnet GCD	Austin	Burkeville confining	0 ²	0	0	0	0	0	0
Bluebonnet GCD	Austin	Jasper aquifer	1,972	1,972	1,972	1,972	1,972	1,972	1,972
Bluebonnet GCD	Grimes	Chicot aquifer	0	0	0	0	0	0	0
Bluebonnet GCD	Grimes	Evangeline aquifer	15,917	15,917	15,917	15,917	15,917	15,917	15,917
Bluebonnet GCD	Grimes	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Grimes	Jasper aquifer	35,570	35,570	35,570	35,570	35,570	35,570	35,570
Bluebonnet GCD	Walker	Chicot aquifer	0	0	0	0	0	0	0
Bluebonnet GCD	Walker	Evangeline aquifer	3,143	3,143	3,143	3,143	3,143	3,143	3,143
Bluebonnet GCD	Walker	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Walker	Jasper aquifer	39,361	39,361	39,361	39,361	39,361	39,361	39,361
Bluebonnet GCD	Waller	Chicot aquifer	791	791	791	791	791	791	791
Bluebonnet GCD	Waller	Evangeline aquifer	54,413	54,413	54,413	54,413	54,413	54,413	54,413
Bluebonnet GCD	Waller	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Waller	Jasper aquifer	329	329	329	329	329	329	329
Bluebonnet GCD Total		Gulf Coast Aquifer System	196,085	196,085	196,085	196,085	196,085	196,085	196,085
Brazoria County	Brazoria	Chicot aquifer	43,086	43,060	43,040	43,027	43,021	43,018	43,018
Brazoria County	Brazoria	Evangeline aquifer	11,869	11,870	11,868	11,868	11,868	11,868	11,868

² A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1. (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Brazoria County GCD Total		Gulf Coast Aquifer System	54,955	54,930	54,908	54,895	54,889	54,886	54,886
Lone Star GCD	Montgomery	Chicot aquifer	20,868	22,117	22,136	23,202	22,878	21,030	21,030
Lone Star GCD	Montgomery	Evangeline aquifer	41,172	41,160	41,397	40,200	40,269	39,815	39,815
Lone Star GCD	Montgomery	Burkeville confining	0 ³	0	0	0	0	0	0
Lone Star GCD	Montgomery	Jasper aquifer	34,925	33,676	33,412	33,527	33,769	36,028	36,028
Lone Star GCD Total		Gulf Coast Aquifer System	96,965	96,953	96,945	96,929	96,916	96,873	96,873
Lower Trinity GCD	Polk	Chicot aquifer	0	0	0	0	0	0	0
Lower Trinity GCD	Polk	Evangeline aquifer	9,486	9,486	9,486	9,486	9,486	9,486	9,486
Lower Trinity GCD	Polk	Burkeville confining	828	828	828	828	828	828	828
Lower Trinity GCD	Polk	Jasper aquifer	30,432	30,432	30,432	30,432	30,432	30,432	30,432
Lower Trinity GCD	San Jacinto	Chicot aquifer	0	0	0	0	0	0	0
Lower Trinity GCD	San Jacinto	Evangeline aquifer	15,110	15,116	15,120	15,127	15,135	15,156	15,156
Lower Trinity GCD	San Jacinto	Burkeville confining	2,762	2,762	2,762	2,762	2,762	2,762	2,762
Lower Trinity GCD	San Jacinto	Jasper aquifer	17,164	17,170	17,174	17,182	17,189	17,210	17,210
Lower Trinity GCD Total		Gulf Coast Aquifer System	75,782	75,794	75,802	75,817	75,832	75,874	75,874
Southeast Texas	Hardin	Chicot aquifer	1,492	1,492	1,492	1,492	1,492	1,492	1,492
Southeast Texas	Hardin	Evangeline aquifer	36,229	36,229	36,229	36,229	36,229	36,229	36,229
Southeast Texas	Hardin	Burkeville confining	0	0	0	0	0	0	0
Southeast Texas	Hardin	Jasper aquifer	0	0	0	0	0	0	0
Southeast Texas	Jasper	Chicot aquifer	10,858	10,858	10,858	10,858	10,858	10,858	10,858
Southeast Texas	Jasper	Evangeline aquifer	43,842	43,842	43,842	43,842	43,842	43,842	43,842
Southeast Texas	Jasper	Burkeville confining	8	8	8	8	8	8	8

³ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Southeast Texas	Jasper	Jasper aquifer	18,657	18,657	18,657	18,657	18,657	18,657	18,657
Southeast Texas	Newton	Chicot aquifer	547	547	547	547	547	547	547
Southeast Texas	Newton	Evangelina aquifer	23,162	23,162	23,162	23,162	23,162	23,162	23,162
Southeast Texas	Newton	Burkeville confining	0 ⁴	0	0	0	0	0	0
Southeast Texas	Newton	Jasper aquifer	13,800	13,800	13,800	13,800	13,800	13,800	13,800
Southeast Texas	Tyler	Chicot aquifer	0	0	0	0	0	0	0
Southeast Texas	Tyler	Evangelina aquifer	18,519	18,519	18,519	18,519	18,519	18,519	18,519
Southeast Texas	Tyler	Burkeville confining	0	0	0	0	0	0	0
Southeast Texas	Tyler	Jasper aquifer	15,871	15,871	15,871	15,871	15,871	15,871	15,871
Southeast Texas GCD Total		Gulf Coast Aquifer System	182,985	182,985	182,985	182,985	182,985	182,985	182,985
District Total		Gulf Coast Aquifer System	606,772	606,747	606,725	606,711	606,707	606,703	606,703
No District-County	Chambers	Chicot aquifer	21,935	21,946	21,957	21,966	21,967	21,968	21,968
No District-County	Chambers	Evangelina aquifer	386	386	386	386	386	386	386
No District-County	Jefferson	Chicot aquifer	15,214	15,214	15,214	15,214	15,214	15,214	15,214
No District-County	Jefferson	Evangelina aquifer	211	211	211	211	211	211	211
No District-County	Liberty	Chicot aquifer	18,594	18,594	18,593	18,594	18,594	18,594	18,594
No District-County	Liberty	Evangelina aquifer	51,924	51,923	51,922	51,922	51,923	51,924	51,924
No District-County	Liberty	Burkeville confining	243	243	243	243	243	243	243
No District-County	Liberty	Jasper aquifer	900	900	900	900	900	900	900
No District-County	Orange	Chicot aquifer	22,854	22,854	22,854	22,854	22,854	22,854	22,854

⁴ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District-County	Orange	Evangeline aquifer	2,351	2,351	2,351	2,351	2,351	2,351	2,351
No District-County	Washington	Evangeline aquifer	11,231	11,231	11,231	11,231	11,231	11,231	11,231
No District-County	Washington	Burkeville confining	421	421	421	421	421	421	421
No District-County	Washington	Jasper aquifer	28,746	28,746	28,746	28,746	28,746	28,746	28,746
No District Total		Gulf Coast Aquifer System	175,010	175,020	175,029	175,039	175,041	175,043	175,043
GMA 14	Total	Gulf Coast Aquifer System	781,782	781,767	781,754	781,750	781,748	781,746	781,746

TABLE A. GROUNDWATER PUMPAGE PROJECTIONS FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER FOR SUBSIDENCE DISTRICT COUNTIES FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Subsidence District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Fort Bend	Fort Bend	Chicot aquifer	58,273	52,870	62,897	73,277	84,381	97,154	97,154
Fort Bend	Fort Bend	Evangeline aquifer	71,572	51,072	56,659	61,881	66,953	72,193	72,193
Fort Bend	Fort Bend	Burkeville confining	0 ⁵	0	0	0	0	0	0
Fort Bend	Fort Bend	Jasper aquifer	0	0	0	0	0	0	0
Fort Bend Subsidence District Total		Gulf Coast Aquifer System	129,845	103,942	119,556	135,158	151,334	169,347	169,347
Harris-Galveston	Galveston	Chicot aquifer	5,817	6,535	7,151	7,746	8,301	8,807	8,807
Harris-Galveston	Galveston	Evangeline aquifer	215	254	284	314	346	373	373
Harris-Galveston	Harris	Chicot aquifer	136,644	108,688	80,496	86,816	90,263	93,781	93,781
Harris-Galveston	Harris	Evangeline aquifer	264,622	176,464	114,859	121,185	126,268	131,389	131,389
Harris-Galveston	Harris	Burkeville confining	0	0	0	0	0	0	0
Harris-Galveston	Harris	Jasper aquifer	8,212	5,432	3,164	3,368	3,519	3,658	3,658
Harris-Galveston Subsidence District Total		Gulf Coast Aquifer System	415,510	297,373	205,954	219,429	228,697	238,008	238,008
GMA 14	Total	Gulf Coast Aquifer System	545,355	401,315	325,510	354,587	380,031	407,355	407,355

⁵ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3. MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Austin	H	Brazos-Colorado	Chicot aquifer	1,432	1,432	1,432	1,432	1,432	1,432
Austin	H	Brazos-Colorado	Evangeline aquifer	19,027	19,027	19,027	19,027	19,027	19,027
Austin	H	Brazos-Colorado	Burkeville confining unit	0 ⁶	0	0	0	0	0
Austin	H	Brazos-Colorado	Jasper aquifer	192	192	192	192	192	192
Austin	H	Brazos	Chicot aquifer	1,462	1,462	1,462	1,462	1,462	1,462
Austin	H	Brazos	Evangeline aquifer	22,217	22,217	22,217	22,217	22,217	22,217
Austin	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Austin	H	Brazos	Jasper aquifer	1,565	1,565	1,565	1,565	1,565	1,565
Austin	H	Colorado	Chicot aquifer	0	0	0	0	0	0
Austin	H	Colorado	Evangeline aquifer	450	450	450	450	450	450
Austin	H	Colorado	Burkeville confining unit	0	0	0	0	0	0
Austin	H	Colorado	Jasper aquifer	214	214	214	214	214	214
Brazoria	H	Brazos-Colorado	Chicot aquifer	10,044	9,842	9,577	9,319	9,066	9,066
Brazoria	H	Brazos-Colorado	Evangeline aquifer	4	5	5	5	5	5
Brazoria	H	Brazos	Chicot aquifer	3,641	3,578	3,510	3,454	3,407	3,407
Brazoria	H	Brazos	Evangeline aquifer	0	0	0	0	0	0
Brazoria	H	San Jacinto-Brazos	Chicot aquifer	29,375	29,620	29,940	30,248	30,545	30,545
Brazoria	H	San Jacinto-Brazos	Evangeline aquifer	11,865	11,863	11,863	11,863	11,863	11,863
Chambers	H	Neches-Trinity	Chicot aquifer	9,968	9,968	9,968	9,968	9,968	9,968
Chambers	H	Neches-Trinity	Evangeline aquifer	0	0	0	0	0	0
Chambers	H	Trinity-San Jacinto	Chicot aquifer	1,756	1,766	1,775	1,777	1,778	1,778
Chambers	H	Trinity-San Jacinto	Evangeline aquifer	386	386	386	386	386	386
Chambers	H	Trinity	Chicot aquifer	10,222	10,222	10,222	10,222	10,222	10,222

⁶ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Chambers	H	Trinity	Evangelina aquifer	0 ⁷	0	0	0	0	0
Fort Bend	H	Brazos-Colorado	Chicot aquifer	7,162	8,504	10,466	13,339	17,547	17,547
Fort Bend	H	Brazos-Colorado	Evangelina aquifer	729	1,082	1,590	2,321	3,380	3,380
Fort Bend	H	Brazos-Colorado	Burkeville confining unit	0 ⁷	0	0	0	0	0
Fort Bend	H	Brazos-Colorado	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	Brazos	Chicot aquifer	24,308	30,446	36,552	42,837	49,691	49,691
Fort Bend	H	Brazos	Evangelina aquifer	13,537	16,080	18,582	21,174	24,041	24,041
Fort Bend	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	Brazos	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	San Jacinto-Brazos	Chicot aquifer	15,320	17,795	20,101	22,054	23,759	23,759
Fort Bend	H	San Jacinto-Brazos	Evangelina aquifer	25,524	28,118	30,370	32,165	33,499	33,499
Fort Bend	H	San Jacinto-Brazos	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	San Jacinto-Brazos	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	San Jacinto	Chicot aquifer	6,081	6,153	6,157	6,151	6,156	6,156
Fort Bend	H	San Jacinto	Evangelina aquifer	11,282	11,379	11,340	11,293	11,273	11,273
Fort Bend	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	San Jacinto	Jasper aquifer	0	0	0	0	0	0
Galveston	H	Neches-Trinity	Chicot aquifer	0	0	0	0	0	0
Galveston	H	Neches-Trinity	Evangelina aquifer	0	0	0	0	0	0
Galveston	H	San Jacinto-Brazos	Chicot aquifer	6,535	7,151	7,746	8,301	8,807	8,807
Galveston	H	San Jacinto-Brazos	Evangelina aquifer	254	284	314	346	373	373
Grimes	G	Brazos	Chicot aquifer	0	0	0	0	0	0
Grimes	G	Brazos	Evangelina aquifer	8,670	8,670	8,670	8,670	8,670	8,670
Grimes	G	Brazos	Burkeville confining unit	0	0	0	0	0	0
Grimes	G	Brazos	Jasper aquifer	22,446	22,446	22,446	22,446	22,446	22,446

⁷ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Grimes	G	San Jacinto	Chicot aquifer	0 ⁸	0	0	0	0	0
Grimes	G	San Jacinto	Evangeline aquifer	7,247	7,247	7,247	7,247	7,247	7,247
Grimes	G	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Grimes	G	San Jacinto	Jasper aquifer	11,840	11,840	11,840	11,840	11,840	11,840
Grimes	G	Trinity	Jasper aquifer	1,283	1,283	1,283	1,283	1,283	1,283
Hardin	I	Neches	Chicot aquifer	1,492	1,492	1,492	1,492	1,492	1,492
Hardin	I	Neches	Evangeline aquifer	36,079	36,079	36,079	36,079	36,079	36,079
Hardin	I	Neches	Burkeville confining unit	0	0	0	0	0	0
Hardin	I	Neches	Jasper aquifer	0	0	0	0	0	0
Hardin	I	Trinity	Chicot aquifer	0	0	0	0	0	0
Hardin	I	Trinity	Evangeline aquifer	150	150	150	150	150	150
Hardin	I	Trinity	Burkeville confining unit	0	0	0	0	0	0
Hardin	I	Trinity	Jasper aquifer	0	0	0	0	0	0
Harris	H	San Jacinto-Brazos	Chicot aquifer	4,859	5,406	5,959	6,383	6,906	6,906
Harris	H	San Jacinto-Brazos	Evangeline aquifer	2,097	2,212	2,323	2,436	2,557	2,557
Harris	H	San Jacinto	Chicot aquifer	101,266	72,533	78,138	81,077	83,988	83,988
Harris	H	San Jacinto	Evangeline aquifer	173,978	112,296	118,483	123,437	128,422	128,422
Harris	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Harris	H	San Jacinto	Jasper aquifer	5,432	3,164	3,368	3,519	3,658	3,658
Harris	H	Trinity-San Jacinto	Chicot aquifer	2,563	2,557	2,718	2,803	2,887	2,887
Harris	H	Trinity-San Jacinto	Evangeline aquifer	389	351	379	395	410	410
Harris	H	Trinity-San Jacinto	B Burkeville confining unit	0	0	0	0	0	0
Harris	H	Trinity-San Jacinto	Jasper aquifer	0	0	0	0	0	0
Jasper	I	Neches	Chicot aquifer	7,740	7,740	7,740	7,740	7,740	7,740
Jasper	I	Neches	Evangeline aquifer	18,534	18,534	18,534	18,534	18,534	18,534

⁸ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Jasper	I	Neches	Burkeville confining unit	0 ⁹	0	0	0	0	0
Jasper	I	Neches	Jasper aquifer	14,546	14,546	14,546	14,546	14,546	14,546
Jasper	I	Sabine	Chicot aquifer	3,118	3,118	3,118	3,118	3,118	3,118
Jasper	I	Sabine	Evangeline aquifer	25,308	25,308	25,308	25,308	25,308	25,308
Jasper	I	Sabine	Burkeville confining unit	8	8	8	8	8	8
Jasper	I	Sabine	Jasper aquifer	4,111	4,111	4,111	4,111	4,111	4,111
Jefferson	I	Neches-Trinity	Chicot aquifer	13,571	13,571	13,571	13,571	13,571	13,571
Jefferson	I	Neches-Trinity	Evangeline aquifer	0	0	0	0	0	0
Jefferson	I	Neches	Chicot aquifer	1,643	1,643	1,643	1,643	1,643	1,643
Jefferson	I	Neches	Evangeline aquifer	211	211	211	211	211	211
Liberty	H	Neches-Trinity	Chicot aquifer	1,397	1,397	1,397	1,397	1,397	1,397
Liberty	H	Neches-Trinity	Evangeline aquifer	656	656	656	656	656	656
Liberty	H	Neches	Chicot aquifer	2,860	2,860	2,860	2,860	2,860	2,860
Liberty	H	Neches	Evangeline aquifer	5,872	5,872	5,872	5,872	5,872	5,872
Liberty	H	Neches	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Neches	Jasper aquifer	0	0	0	0	0	0
Liberty	H	San Jacinto	Chicot aquifer	973	973	973	973	973	973
Liberty	H	San Jacinto	Evangeline aquifer	9,183	9,183	9,183	9,183	9,184	9,184
Liberty	H	San Jacinto	Burkeville confining unit	243	243	243	243	243	243
Liberty	H	San Jacinto	Jasper aquifer	900	900	900	900	900	900
Liberty	H	Trinity-San Jacinto	Chicot aquifer	3,330	3,329	3,330	3,330	3,330	3,330
Liberty	H	Trinity-San Jacinto	Evangeline aquifer	7,214	7,213	7,214	7,214	7,215	7,215
Liberty	H	Trinity-San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Trinity-San Jacinto	Jasper aquifer	0	0	0	0	0	0
Liberty	H	Trinity	Chicot aquifer	10,034	10,034	10,034	10,034	10,034	10,034

⁹ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Liberty	H	Trinity	Evangeline aquifer	28,997	28,997	28,997	28,997	28,997	28,997
Liberty	H	Trinity	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Trinity	Jasper aquifer	0	0	0	0	0	0
Montgomery	H	San Jacinto	Chicot aquifer	22,117	22,136	23,202	22,878	21,030	21,030
Montgomery	H	San Jacinto	Evangeline aquifer	41,160	41,397	40,200	40,269	39,815	39,815
Montgomery	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Montgomery	H	San Jacinto	Jasper aquifer	33,676	33,412	33,527	33,769	36,028	36,028
Newton	I	Neches	Jasper aquifer	199	199	199	199	199	199
Newton	I	Sabine	Chicot aquifer	547	547	547	547	547	547
Newton	I	Sabine	Evangeline aquifer	23,162	23,162	23,162	23,162	23,162	23,162
Newton	I	Sabine	Burkeville confining unit	0	0	0	0	0	0
Newton	I	Sabine	Jasper aquifer	13,600	13,600	13,600	13,600	13,600	13,600
Orange	I	Neches-Trinity	Chicot aquifer	280	280	280	280	280	280
Orange	I	Neches-Trinity	Evangeline aquifer	0 ¹⁰	0	0	0	0	0
Orange	I	Neches	Chicot aquifer	4,039	4,039	4,039	4,039	4,039	4,039
Orange	I	Neches	Evangeline aquifer	2,228	2,228	2,228	2,228	2,228	2,228
Orange	I	Sabine	Chicot aquifer	18,535	18,535	18,535	18,535	18,535	18,535
Orange	I	Sabine	Evangeline aquifer	124	124	124	124	124	124
Polk	I	Neches	Chicot aquifer	0	0	0	0	0	0
Polk	I	Neches	Evangeline aquifer	4,247	4,247	4,247	4,247	4,247	4,247
Polk	I	Neches	Burkeville confining unit	142	142	142	142	142	142
Polk	I	Neches	Jasper aquifer	12,376	12,376	12,376	12,376	12,376	12,376
Polk	H	Trinity	Chicot aquifer	0	0	0	0	0	0
Polk	H	Trinity	Evangeline aquifer	5,239	5,239	5,239	5,239	5,239	5,239
Polk	H	Trinity	Burkeville confining unit	687	687	687	687	687	687

¹⁰ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Polk	H	Trinity	Jasper aquifer	18,055	18,055	18,055	18,055	18,055	18,055
San Jacinto	H	San Jacinto	Chicot aquifer	0	0	0	0	0	0
San Jacinto	H	San Jacinto	Evangeline aquifer	10,472	10,476	10,484	10,491	10,512	10,512
San Jacinto	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
San Jacinto	H	San Jacinto	Jasper aquifer	7,972	7,976	7,983	7,991	8,012	8,012
San Jacinto	H	Trinity	Chicot aquifer	0	0	0	0	0	0
San Jacinto	H	Trinity	Evangeline aquifer	4,644	4,644	4,644	4,644	4,644	4,644
San Jacinto	H	Trinity	Burkeville confining unit	2,762	2,762	2,762	2,762	2,762	2,762
San Jacinto	H	Trinity	Jasper aquifer	9,198	9,198	9,198	9,198	9,198	9,198
Tyler	I	Neches	Chicot aquifer	0	0	0	0	0	0
Tyler	I	Neches	Evangeline aquifer	18,519	18,519	18,519	18,519	18,519	18,519
Tyler	I	Neches	Burkeville confining unit	0	0	0	0	0	0
Tyler	I	Neches	Jasper aquifer	15,871	15,871	15,871	15,871	15,871	15,871
Walker	H	San Jacinto	Chicot aquifer	0	0	0	0	0	0
Walker	H	San Jacinto	Evangeline aquifer	3,143	3,143	3,143	3,143	3,143	3,143
Walker	H	San Jacinto	Burkeville confining unit	0 ¹¹	0	0	0	0	0
Walker	H	San Jacinto	Jasper aquifer	23,479	23,479	23,479	23,479	23,479	23,479
Walker	H	Trinity	Jasper aquifer	15,881	15,881	15,881	15,881	15,881	15,881
Waller	H	Brazos	Chicot aquifer	632	632	632	632	632	632
Waller	H	Brazos	Evangeline aquifer	22,437	22,437	22,437	22,437	22,437	22,437
Waller	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Waller	H	Brazos	Jasper aquifer	329	329	329	329	329	329
Waller	H	San Jacinto	Chicot aquifer	159	159	159	159	159	159

¹¹ A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer	2030	2040	2050	2060	2070	2080
Waller	H	San Jacinto	Evangeline aquifer	31,976	31,976	31,976	31,976	31,976	31,976
Waller	H	San Jacinto	Burkeville confining unit	0 ¹²	0	0	0	0	0
Waller	H	San Jacinto	Jasper aquifer	0	0	0	0	0	0
Washington	G	Brazos	Evangeline aquifer	11,231	11,231	11,231	11,231	11,231	11,231
Washington	G	Brazos	Burkeville confining unit	421	421	421	421	421	421
Washington	G	Brazos	Jasper aquifer	28,512	28,512	28,512	28,512	28,512	28,512
Washington	G	Colorado	Jasper aquifer	233	233	233	233	233	233
GMA 14 Total			Gulf Coast Aquifer System	1,183,076	1,107,258	1,136,330	1,161,773	1,189,095	1,189,095

¹² A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.