

Innovative approaches Practical results Outstanding service

## MAG Peak Factors Region H Recommendations for 2026 RWP

Prepared for:

**Region H Water Planning Group** 



F-2144



Prepared by:

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## **MEMORANDUM**



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<b>TO:</b>	Texas Water Development Board
FROM:	Courtney Corso, P.E. and Philip Taucer, P.E.
SUBJECT:	MAG Peak Factors – Region H Recommendations for 2026 RWP
DATE:	November 7, 2024
<b>PROJECT:</b>	Region H 2026 Regional Water Plan – Supply Evaluation

## 1. Introduction

When developing Regional Water Plans (RWPs), planning groups consider water supply availability under droughtof-record conditions. Meanwhile, the joint planning process for groundwater in Texas considers long-term average conditions and determines Modeled Available Groundwater (MAG) supplies, which estimate a potential level of pumping that can be sustained on an average annual basis to meet a Desired Future Condition (DFC) based on the most current Groundwater Availability Model (GAM) and understanding of an aquifer. The RWP process uses MAG values as a starting basis to estimate available groundwater supplies. However, because of the disconnect between the joint planning approach and the worst-case scenario in regional planning, MAGs can underestimate the actual peak pumping that may occur during a drought-of-record year. Some Groundwater Conservation Districts (GCDs) have rules and regulatory structures which allow for short-term peak pumping while still complying with the DFC on a long-term basis. In these cases, application of the MAG to the RWP process excludes this regulatory flexibility and may place unnecessary limitations upon supplies used for planning purposes, thus underrepresenting the water supply available to meet short-term peak demands.

To address this limitation, beginning in the 5th cycle of RWP development, the Texas Water Development Board (TWDB) allowed the implementation of MAG Peak Factors, which are multipliers greater than 100% applied to MAG values to estimate dry-year availability. The intent of the MAG Peak Factor is to bridge the gap between groundwater joint planning and regional planning perspectives. Regional Water Planning Groups (RWPGs) are not required to use MAG Peak Factors but are given the option to apply them where deemed appropriate on a county-aquifer basis. The MAG Peak Factor is not intended to adjust the long-term supply as derived from the DFCs developed through the joint planning process for groundwater. Instead, the intention is to make the regional planning process consistent with regulations by local groundwater districts and patterns of permitted and exempt water use. The following sections summarize the Peak Factor development methodology applied by the Region H Water Planning Group (RHWPG), the administrative and approvals process, and the rules and processes currently applied by the applicable GCDs to monitor groundwater use and progress toward achievement of DFCs.

## 2. Peak Factors in Region H

The RHWPG developed a consistent methodology to determine a MAG Peak Factor for each county-aquifer unit in the Region which has an associated MAG. In order to reflect realistic peaking behavior, 16 years of historical pumping records were used to develop proposed MAG Peak Factors. Because pumping records and reporting for individual well owners or operators may vary from year to year, Peak Factors for Region H were calculated on a county-aquifer basis and are applied evenly to each river basin within those splits. The option to apply MAG Peak Factors was discussed with staff from each GCD in the region; these districts are listed in **Table 1**. **Table 1** also describes which counties are included in each GCD and which aquifers have been deemed relevant for joint planning. (MAG values are only developed for relevant aquifers.) Please note that areas within the Harris-Galveston Subsidence District (HGSD) and Fort Bend Subsidence District (FBSD) are excluded as these areas have been deemed non-MAG areas for RWP purposes by TWDB.

GCD	Counties	Aquifers Relevant for Joint Planning
Bluebonnet GCD	Austin, Grimes <sup>1</sup> , Walker, and Waller	Gulf Coast
Brazoria County GCD	Brazoria	Gulf Coast
Lone Star GCD	Montgomery	Gulf Coast
Lower Trinity GCD	Polk, San Jacinto	Gulf Coast
Mid-East Texas GCD	Leon, Madison, and Freestone <sup>2</sup>	Carrizo-Wilcox, Queen City, Sparta, and Yegua-Jackson

 Table 1. Groundwater Conservation Districts in Region H

1. Grimes County is in Region G. 2. Freestone County is in Region C.

After discussion with GCDs in Region H, only Brazoria County GCD (BCGCD) chose to pursue application of a MAG Peak Factor for the current (sixth) planning cycle. The results summarized in this memorandum therefore are limited to the Gulf Coast Aquifer in Brazoria County.

Subsequent to approval by BCGCD, the proposed MAG Peak Factor for the Gulf Coast Aquifer in Brazoria County was evaluated in a modeling exercise using the GAM. Modeling results indicated that applying peaking over time, consistent with the proposed MAG Peak Factor, has a negligible impact on metrics associated with the DFCs. This evaluation is described further in *Section 2.3*.

#### 2.1. Methodology

The GCDs in Region H manage groundwater with respect to their DFC and do not restrict total annual pumping to the MAG, but instead allow pumping to fluctuate between years. While many districts do consider groundwater production relative to the MAG, they do so as one of a number of approaches to evaluating the impacts of pumpage on aquifers and progress toward long-term DFC achievement. As such, historical pumpage within many areas of Region H varies from year to year, with production typically increasing noticeably during dry years and subsequently declining upon the return of more normal or wet conditions. Timing and magnitude of peaks and reductions in pumpage vary widely among counties based upon overall demand, demand types, and aquifer.

Similar to historical patterns of groundwater use, in which dry-year pumping exceeds the long-term trend, Region H assumes that the drought-of-record years represented in the RWP would also experience pumping above the long-term trend which is represented in the RWP by the MAG. Therefore, historical pumping was assessed to determine the ratio of peak to long-term annual pumpage using TWDB Water Use Survey historical pumping data from years 2005 to 2020. The MAG Peak Factor is this ratio of historical peak pumping to long-term average pumping at the county and aquifer level. The MAG Peak Factor is then applied in the RWP as the ratio of RWP supply availability (dry-year conditions) to the corresponding MAG.

For counties in which the Gulf Coast Aquifer is the only major aquifer, all pumping categorized in the TWDB datasets as "Other Aquifer" or "Unknown Aquifer" was assumed to originate from the Gulf Coast Aquifer. TWDB Water Use Survey data was utilized for several reasons:

- Availability of county-level information in a consistent format;
- Representation of recent conditions, including recent growth in urbanizing portions of Region H; and
- Inclusion of a range of hydrologic conditions, including extremely dry conditions for year 2011.

The Peak Factor was estimated using the relationship:

$$Peak \ Factor = \frac{(peak \ pumpage)}{(linear \ approximation \ in \ year \ of \ peak \ pumpage)}$$

For this analysis, peak pumpage was defined as the maximum annual pumping volume from an aquifer within a given county during 2005 to 2020. The linear approximation in the denominator is the predicted pumping in the year of peak pumping, based on a linear fit of annual pumping during 2005 to 2020 to account for long-term trends in pumping. This concept is represented in **Figure 1**.



Figure 1. Historical Pumping from the Gulf Coast Aquifer in Brazoria County

## 2.2. Recommended MAG Peak Factor: Brazoria County – Gulf Coast Aquifer

The MAG Peak Factor developed for the Gulf Coast Aquifer in Brazoria County and approved by BCGCD and GMA 14 is summarized in **Table 2**. This Peak Factor is proposed as a constant factor for use in each planning decade in the 2026 RWP. Supporting data for MAG Peak Factor calculations in electronic format will be transmitted to TWDB

along with this memorandum. Additional information on the administrative process and GCD approvals can be found in *Section 3* of this memorandum.

County	Aquifer	GCD	GMA	Peak Factor
Brazoria	Gulf Coast	Brazoria County GCD	14	129.89%

Table 2. Summary of Peak Factors for Region H

Historical information used to calculate the Peak Factor for the Gulf Coast Aquifer in Brazoria County is illustrated in **Figure 1**, with resultant peaked MAG values for RWP purposes shown in **Figure 2**. It should be noted that the Region H RWP assumes that groundwater supply availability in Brazoria County is fully allocated as existing supply.



Figure 2. Peaked MAG for the Gulf Coast Aquifer in Brazoria County

#### 2.3. Modeling Assessment

In order to confirm that the temporary availability increase represented by applying the MAG Peak Factor will not prevent BCGCD nor surrounding GCDs from managing groundwater resources to achieve DFCs, a modeling analysis was conducted by INTERA. This analysis used the GAM for the northern portion of the Gulf Coast Aquifer System that was approved at the time of the 2021 joint planning cycle and which was used in development of DFCs and MAGs; this model is referred to as the Houston Area Groundwater Model ("HAGM"; Kasmarek, 2012). The modeling analysis used the methods documented in Appendix R of the explanatory report for GMA 14 DFCs from the 2021 cycle of joint planning (GMA 14, 2022); this GMA 14 DFC Run was used as a baseline for evaluating the impacts of applying a MAG Peak Factor.

Pumping in Brazoria County was adjusted in a model run representing the application of the proposed MAG Peak Factor, hereafter referred to as the Peak Factor Run. Demands and supply availability are described in the RWPs

on a decadal basis. For further examination in a groundwater modeling analysis, annual pumping is required in order to develop inputs for each model stress period. The pumping was adjusted by applying an annual factor to each stress period from 2030 to 2080. The time series of annual factors was developed using the approach described above for the Peak Factor, but historical pumping from each year of the period 2005 to 2020 was divided by the linear approximation for that year to create a cycle of increasing and decreasing pumping with a long-term average approximately equivalent to the MAG. This process is described in detail below.

- 1. Determine long-term average pumping assumed for modeling: Long-term average pumping in Brazoria County was assumed to be equivalent to the MAG in each planning decade. This is based on groundwater demand in the county as projected for the 2026 Region H RWP, which indicates that peaked availability (MAG multiplied by the MAG Peak Factor) will be fully allocated to existing supplies with no surplus groundwater available.
- 2. **Describe annual average trend in pumping:** Interim annual values were interpolated between decadal MAG values.
- 3. **Develop annual pumping factors:** The peaking trend used by the RHWPG to determine MAG Peak Factors was studied on a basis of deviation from long-term trend rather than long-term average. This methodology was selected in order to account for the trends in overall groundwater use over the 16-year period of record. Therefore, it was necessary to normalize the entire period in a similar fashion. A linear trend line was developed based on historic pumping in Brazoria County from the Gulf Coast Aquifer from 2005 to 2020 (**Figure 1**). Individual pumpage values for each year were divided by the estimated trend line value in that year to determine a trend-normalized annual factor.
- 4. Develop annual pumping volumes: The normalized peak factor from Step 3 was then applied to the average annual pumpage from Step 2 to represent fluctuating annual demands due to year-to-year variations in climatic conditions. As it is impossible to exactly predict future trends in water use due to seasonal and annual climatic variables, this process assumes the repetition of the trends in the historic period over the entirety of the planning period. Therefore, the 2005-2020 normalized annual peaking patterns were repeated throughout the RWP planning horizon of the year 2030 through the year 2080. This allowed for continuous cycling of the high and low demand patterns, overlaid upon the annual average demands interpolated in Step 2. The results of this analysis provide a potential synthetic demand pattern in Brazoria County that is consistent with the MAG Peak Factor proposed by the RHWPG.

The time series of annual factors was applied to all pumping cells within Brazoria County in the GMA 14 DFC Run; no changes were made to the spatial distribution of pumping. The resulting annual pumping used in the model in Brazoria County, shown in **Figure 3**, demonstrates that the methodology to develop the MAG Peak Factor is based on assumed patterns of fluctuating peak demands and lower demands having a long-term average value approximately equivalent to the MAG. Supporting data for calculations of modeled annual pumping volumes will be transmitted in electronic format to TWDB along with this memorandum.



Figure 3. Simulated Annual Pumping Using Annual Factor

DFCs in GMA 14 are based on two metrics: median available drawdown (2009 to 2080) and additional subsidence (2009 to 2080). Specifically, the DFCs are defined as follows:

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

Results of the Peak Factor Run were compared to the GMA 14 DFC Run for each of the DFC metrics (**Table 3**). As expected, the largest changes in remaining available drawdown and subsidence are in Brazoria County, with smaller changes in adjacent counties. Changes in all counties are considered to be small enough to have no significant effect on DFC achievement with the application of the MAG Peak Factor.

Groundwater availability modeling files used for this assessment will be transmitted in electronic format to TWDB along with this memorandum. *Attachment A* contains an index of associated modeling files included in the transmittal. These include the unadjusted model well files from the GMA 14 DFC Run, the adjusted model well files from the Peak Factor Run, and other model input files. Detailed georeferenced maps of pumping assumptions are omitted from the submittal, as the spatial distribution of pumping was not revised between the GMA 14 DFC Run and the Peak Factor Run, as demonstrated in the model well files.

## Table 3. Comparison of Model Results: Median Available Drawdown Remaining and Modeled Average Subsidence

	GMA 14 DFC Model Run		Peak Factor Run		Difference	
County	Available Drawdown Remaining (2009 to 2080)	2080 Modeled Average Subsidence (feet)	Available Drawdown Remaining (2009 to 2080)	2080 Modeled Average Subsidence (feet)	Available Drawdown Remaining Difference (2009 to 2080)	2080 Modeled Average Subsidence Difference (feet)
Austin	92.47%	0.4048	92.47%	0.4048	0.00%	0.0000
Brazoria	86.96%	1.0009	87.39%	0.9816	0.43%	-0.0193
Chambers	76.22%	0.9625	76.21%	0.9625	-0.01%	0.0000
Fort Bend	58.02%	2.2345	58.07%	2.2303	0.05%	-0.0042
Galveston	86.51%	1.4980	86.64%	1.4928	0.13%	-0.0052
Grimes	69.76%	0.0388	69.76%	0.0388	0.00%	0.0000
Hardin	81.04%	0.5593	81.04%	0.5593	0.00%	0.0000
Harris	82.53%	0.8211	82.53%	0.8199	0.00%	-0.0012
Jasper	69.08%	0.2675	69.08%	0.2675	0.00%	0.0000
Jefferson	68.38%	0.5885	68.38%	0.5885	0.00%	0.0000
Liberty	76.13%	1.1089	76.13%	1.1089	0.00%	0.0000
Montgomery	67.74%	0.5457	67.74%	0.5457	0.00%	0.0000
Newton	70.03%	0.1762	70.03%	0.1762	0.00%	0.0000
Orange	91.02%	1.0049	91.02%	1.0049	0.00%	0.0000
Polk	81.90%	0.0341	81.90%	0.0341	0.00%	0.0000
San Jacinto	81.96%	0.1098	81.96%	0.1098	0.00%	0.0000
Tyler	78.02%	0.0423	78.02%	0.0423	0.00%	0.0000
Walker	69.74%	0.0171	69.74%	0.0171	0.00%	0.0000
Waller	69.35%	0.6330	69.35%	0.6330	0.00%	0.0000
Washington	77.13%	0.0124	77.13%	0.0124	0.00%	0.0000

## **3. Administrative Process**

In accordance with the Second Amended General Guidelines for Development of the 2026 Regional Water Plans and other TWDB guidance, the RHWPG coordinated with local groundwater regulatory entities regarding proposed Peak Factors and compatibility with GCD management goals. At its May 3, 2023 public meeting, the RHWPG considered the topic of MAG Peak Factors and authorized the Region H Consultant Team and Groundwater Supply Committee to coordinate with groundwater regulatory entities to develop MAG Peak Factors for Region H and submit an associated request to TWDB. Attachment B includes documentation of the RWPG decision to authorize the submission of this request.

As noted earlier, only Brazoria County GCD requested to pursue a Peak Factor; other GCDs declined to pursue the option for the 2026 RWP. Brazoria County GCD considered the option for a Peak Factor at a public meeting of its District Board and took formal action to approve the use of a MAG Peak Factor for the 2026 Region H RWP. GMA 14 subsequently approved the MAG Peak Factor proposed by Region H and approved by the BCGCD for Brazoria County. GCD and GMA approvals are summarized in **Table 4**, with documentation of these approvals included in *Attachment B*.

County	Aquifer GCD		GCD Approval Date	GMA	GMA Approval Date
Brazoria	Gulf Coast	Brazoria County GCD	1/11/2024	GMA 14	2/29/2024

Table 4. GCD and GMA Peak Factor Approvals

## 4. District Methodologies for Monitoring DFC Compliance

As noted in *Section 2.1* of this memorandum, the GCDs within Region H manage groundwater within their jurisdictions in the context of their DFCs, allowing some degree of inter-annual fluctuation in production. The MAG Peak Factor option allows the RWP to better reflect this short-term peak use allowed by GCD rules and observed in historical pumpage records and does not impact the joint groundwater planning process or in any way modify established MAG values or DFCs for any district. The MAG Peak Factor proposed in this memorandum has been approved by the applicable GCD and GMA and is not anticipated to preclude or hinder achievement of DFC attainment or other GCD management goals.

The GCDs in Region H include within their Groundwater Management Plans and district rules measures to facilitate meeting their goals, including but not limited to goals for DFC achievement. As part of this process, all five of these GCDs engage in monitoring of groundwater levels, either as part of regular in-house technical evaluations of well data or through special studies and participation in long-term monitoring programs with the United States Geological Survey (USGS) or HGSD. These evaluations allow the GCDs to assess changes in water levels over time relative to levels consistent with DFC achievement. The districts also require permitted (non-exempt) wells to report groundwater pumpage on a regular basis, providing another metric to assist in evaluating progress toward long-term DFC achievement. Key processes in monitoring DFC achievement, controlling subsidence, and promoting the efficient use of groundwater for each of the applicable GCDs are summarized in **Table 5**.

Measure	Bluebonnet GCD	Brazoria County GCD	Lone Star GCD	Lower Trinity GCD	Mid-East Texas GCD
Water Level Analyses?	Yes - Annual analysis by GCD	Yes - Biannual analysis by GCD, work w/ USGS	Yes – annual monitoring; analysis by GCD at least once every 3 years	Yes - Annual analysis by GCD	Yes - Annual analysis by GCD
Subsidence Analyses?	Considered during permit review process	Yes - Biannual analysis by GCD, work w/ USGS et al.	Yes – regular monitoring and separate analyses	Considered during permit review process	Considered during permit review process
Well Permitting Required?	Yes	Yes	Yes	Yes	Yes
Registration of Exempt Wells Required?	Yes	Yes	Yes	Yes	Yes
Pumpage Reporting for Non-Exempt Wells	Yes	Yes	Yes	Yes	Yes
Production Fees Applied?	Yes – based on production	Yes – based on permitted volume	Yes – based on permitted volume	Yes – based on production	Yes – based on production
Consideration of Drought Monitor?	Yes	Yes	Yes	Yes	Yes

Table 5. Key GCD Monitoring and Management Processes

## 5. References

GMA 14. (2022). *Desired Future Conditions Explanatory Report*. Prepared by the Groundwater Conservation Districts in Groundwater Management Area 14.

Kasmarek, M. (2012). Hydrogeology and simulation of groundwater flow and land-surface subsidence in the northern part of the Gulf Coast Aquifer System, Texas, 1891-2009. U.S. Geological Survey.

Attachment A Groundwater Availability Modeling Files for Region H MAG Peak Factor Evaluation

File Name	Scenario
HAGM_BT_base_2080.sip	Both
HAGM_BT_base_2080.bas	Both
HAGM_BT_base_2080.bcf	Both
HAGM_BT_base_2080.sub	Both
HAGM_BT_base_2080.oc	Both
HAGM_BT_base_2080.dis	Both
HAGM_BT_base_2080.ghb	Both
HAGM_BT_base_2080.nam	GMA 14 DFC
HAGM_BT_base_pest_2080.wel	GMA 14 DFC
brazoria_peak_factor.wel	Peak Factor
HAGM_BT_base_2080_brazoria_peak_factor.nam	Peak Factor

Table A-1. Modeling Input Files Used for Evaluation of Proposed MAG Peak Factor

Attachment B RWPG, GCD, and GMA Approvals

Region H Water Planning Group Meeting Minutes May 3, 2023

## REGION H WATER PLANNING GROUP MINUTES OF REGULAR MEETING MAY 3, 2023

#### **MEMBERS PRESENT:**

David Bailey, John Bartos, Arthur Bredehoft, Brad Brunett, Carl Burch, Jun Chang, Mark Evans, Ken Kramer, Marvin Marcell, Mike O'Connell, Byron Ryder, Loyd Smith, Michael Turco, and Brandon Wade (Alisa Max was present following appointment to the Regional Planning Group).

**ALTERNATES PRESENT:** Samantha Reiter for Gary Ashmore, Ekaterina Fitos for Yvonne Forrest, Matthew Barrett for Jace Houston, Jason Gerrard for Glenn Lord, and Jim Sims for Kevin Ward.

**MEMBERS ABSENT**: W.R. Baker, James Comin, Caleb Cooper, Robert Istre, Ivan Langford, and Danny Pierce.

#### 1. CALL TO ORDER

The meeting was called to order at 10:02 a.m.

#### 2. INTRODUCTIONS

Mr. Evans introduced Heather Rose, Texas Water Development Board's contract manager for Region H. He stated that the Department of Agriculture provided a letter naming Kristin Lambert as their representative with Manuel Martinez as alternate.

#### 3. REVIEW AND APPROVE MINUTES OF THE FEBRUARY 1, 2023 MEETING.

Mr. Bredehoft made a motion to approve the minutes of February 1, 2023, with a correction to identify Mr. James Comin and Mr. Ivan Langford as not present at the February 1, 2023, Region H Water Planning meeting. The motion was seconded by Mr. Marcell and carried unanimously.

# 4. RECEIVE PUBLIC COMMENTS ON SPECIFIC ISSUES RELATED TO AGENDA ITEMS 5 THROUGH 7.

There were no comments.

#### 5. PLANNING GROUP MEMBERSHIP

## a. RECEIVE NOMINATING COMMITTEE REPORT AND CONSIDER TAKING ACTION TO APPROVE MEMBERS TO FILL VACANCIES ON THE REGION H WATER PLANNING GROUP (RHWPG)

Mr. Chang stated that the Nominating Committee met on May 3, 2023, to discuss nominations to fill the water utilities vacancy. Mr. Chang stated that the Nominating Committee recommends Alisa Max to fill the water utilities vacancy. Mr. Wade made a motion to accept the Nominating Committee's recommendation to appoint Ms. Alisa Max to the Region H Water Planning Group representing water utilities. The motion was seconded by Ken Kramer and carried with 18 ayes and 1 nay (Mike O'Connell).

#### 6. PLAN DEVELOPMENT AND ADMINISTRATION

a. RECEIVE UPDATE FROM CONSULTANT TEAM AND NON-POPULATION DEMANDS COMMITTEE REGARDING RECOMMENDED REVISIONS TO DRAFT TEXAS WATER DEVELOPMENT BOARD (TWDB) PROJECTIONS FOR THE 2026 REGION H REGIONAL WATER PLAN (RWP) AND CONSIDER APPROVING SUBMITTAL TO TWDB.

Mr. Taucer provided information related to the various recommendations from the Non-Population Demands Committee regarding the draft Texas Water Development Board projections for the 2026 Region H Water Plan. He provided the committee's recommendations related to irrigation, manufacturing, mining, and steam electric power. Mr. Taucer stated that the proposed recommendations for this cycle are similar to the last cycle's projections. Mr. Ken Kramer asked that the Texas Water Development Board take into consideration agricultural use. Discussion ensued. Mr. Bredehoft made a motion to approve the submittal to TWDB along with Mr. Kramer's comments. The motion was seconded by Mr. Marcell and carried unanimously.

## b. RECEIVE UPDATE FROM CONSULTANT TEAM AND POPULATION DEMANDS COMMITTEE REGARDING RECOMMENDED REVISIONS TO DRAFT TWDB PROJECTIONS FOR THE 2026 REGION H RWP AND CONSIDER APPROVING SUBMITTAL TO TWDB

Mr. Taucer provided information related to the various recommendations from the Population Demands Committee regarding the draft TWDB projections for the 2026 Region H Regional Water Plan. Mr. Marcell provided a brief history of the methodology used over the last several years to project population water demand. He stated that the committee recommended using the Joint Regulatory Plan Review (JRPR) populations where available, utilize TWDB projections in remaining counties, and for select counties, use 0.5 migration projection. Discussion ensued. Mr. Kramer made a motion to approve the Population Demands Committee's recommendations to submit said recommendations to TWDB. The motion was seconded by Mr. Bredehoft and carried unanimously.

#### c. RECEIVE PRESENTATION ON AND DISCUSS THE REGION H WUG SURVEY

Mr. Taucer explained that the WUG survey is a regular part of the planning process. He stated that the information obtained is utilized in projections, identifying existing supplies and infrastructure, interconnect facilities, future projects, and conservation and drought contingencies.

## d. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING IDENTIFICATION OF MAJOR WATER PROVIDERS (MWPS) FOR REGION H AND CONSIDER TAKING ACTION DIRECTING THE CONSULTANT TEAM TO SUBMIT A LIST OF RECOMMENDED MWPS TO THE TWDB

Mr. Taucer stated that TWDB incorporated the Major Water Provider concept in the previous cycle. He stated that TWDB gave each Regional Water Planning Group the latitude in determining entities of key significance in the region's supplies. He explained that last cycle, the planning group recommended designating any entity that had more than 25,000 acre-feet per year of anticipated current or future supply to itself or others, with the Population Demands Committee recommending an additional criterion of at least 10,000 acre-feet per year of anticipated current or future supply to recipients outside of the entity's retail service area. Mr. Taucer then provided a list of the potential MWPS meeting these criteria for Region H. Mr. Bredehoft made a motion to direct the consultant team to submit a list of recommended MWPs to the TWDB. The motion was seconded by Mr. Bartos and carried unanimously.

## e. RECEIVE REPORT FROM CONSULTANT TEAM REGARDING UPCOMING GROUNDWATER SUPPLY ANALYSES AND CONSIDER TAKING ACTION TO AUTHORIZE CONSULTANT TEAM AND GROUNDWATER SUPPLY COMMITTEE TO COORDINATE WITH GROUNDWATER REGULATORY ENTITIES TO DEVELOP MAG PEAK FACTORS FOR REGION H AND SUBMIT AN ASSOCIATED REQUEST TO TWDB.

Mr. Taucer provided information related to the groundwater supply analyses. He explained that MAG peak factors allow the Regional Water Plan to better reflect situations where groundwater conservation districts allow temporary production in excess of Modeled Available Groundwater. The MAG peak factors do not change the MAG or any regulatory entity's regulatory approach and are related specifically to the Regional Water Plan. He explained that MAG peak factors must be studied by any Planning Group requesting their use, approved by each of the applicable groundwater conservation districts and groundwater management areas, and by TWDB. Mr. Taucer stated that this process was utilized by the Region H Water Planning Group for the 2021 Regional Water Plan. Mr. Turco made a motion to authorize the consultant team and Groundwater Supply Committee to coordinate with groundwater regulatory entities to develop MAG peak factors for Region H and submit an associated request to TWDB. The motion was seconded by Mr. Chang and carried unanimously.

f. RECEIVE UPDATE FROM CONSULTANT TEAM REGARDING UPCOMING SURFACE WATER SUPPLY ANALYSES AND CONSIDER TAKING ACTION TO AUTHORIZE THE CONSULTANT TEAM AND SURFACE WATER SUPPLY COMMITTEE TO DEVELOP AND SUBMIT TO THE TWDB A REQUEST FOR POTENTIAL EXCEPTIONS TO SURFACE WATER MODELING REQUIREMENTS.

Mr. Taucer explained that surface water availability in the regional plan is required to be examined through TCEQ's Water Availability Model ("WAM") Run 3 which includes a very specific set of assumptions that looks at existing permanent rights in the priority system, historical hydrology, full authorized diversions, and no/limited return flows. He stated that TWDB specified utilizing WAM Run 3 due to its cautious assumptions. Mr. Taucer stated that TWDB requires any group utilizing any other model or a modified WAM to request an exception to the surface water modeling requirements. He stated that Region H is requesting the use of Region G's modified model as well as information and model elements from Region C. Mr. Sims made a motion to authorize the consultant team and Surface Water Supply Committee to develop and submit to the TWDB a request for potential exceptions to Surface Water Modeling requirements. The motion was seconded by Mr. Bredehoft and carried unanimously.

#### 7. GENERAL UPDATES AND OUTREACH

# a. RECEIVE UPDATE REGARDING SCHEDULE AND MILESTONES FOR THE DEVELOPMENT OF THE 2026 REGION H RWP.

Mr. Taucer stated that the next four to six months will be busy for various committees with a Technical Memorandum due to TWDB in March of 2024.

#### **b.** RECEIVE UPDATE FROM LIAISONS TO OTHER PLANNING GROUPS.

Mr. Wade stated that he was invited by Region G to give a presentation on the Brazos Alluvium. Ms. Rose stated that Mr. Evans was elected as Chair of the Interregional Planning Council.

## c. RECEIVE REPORT REGARDING RECENT AND UPCOMING ACTIVITIES RELATED TO COMMUNICATIONS AND OUTREACH EFFORTS ON BEHALF OF THE RHWPG.

Mr. Taucer had no information at this time.

#### d. AGENCY COMMUNICATIONS AND GENERAL INFORMATION.

Ms. Rose provided information related to administrative logistics. Mr. Bredehoft stated that infrastructure surcharges at the retail level will be the topic of discussion in The Woodlands in the near future.

## 8. RECEIVE PUBLIC COMMENTS.

Mr. Sarkis provided comments related to agenda item 6a.

#### 9. NEXT MEETING:

It was announced that the next Region H Water Planning meeting is scheduled for July 5, 2023.

#### 10. ADJOURN.

Without objection, the meeting was adjourned at 11:32 a.m.

Brazoria County Groundwater Conservation District Meeting Minutes January 11, 2024

## MINUTES OF THE MEETING OF THE BOARD OF DIRECTORS OF THE BRAZORIA COUNTY GROUNDWATER CONSERVATION DISTRICT

The Board of Directors of the Brazoria County Groundwater Conservation District met Thursday, the 11<sup>h</sup> day of January 2024, at 4:00 p.m. and in the Brazoria County Groundwater Conservation District Office, 451 N. Velasco Street, 1<sup>st</sup> Floor, Suite 140, Angleton, Texas.

The meeting was called to order by Director Davenport at 4:06 p.m.

The roll was called of the duly constituted members of the Board, to wit:

Patrick O'Day Dennis Davenport Robby Goolsby Gary Moore Charlie Greenberg President Vice President Secretary Assistant Secretary Director

All of said Directors were present, except Director O'Day and Director Moore, thus constituting a quorum.

Also present for all or part of the meeting, were the following: Beverly Hopkins, General Manager, and Jodie Parnell, Administrative Assistant, Michael White, Field Coordinator and Philip Taucer with Freese & Nichols.

#### PUBLIC COMMENTS:

No public comments were received.

#### FORMAL PRESENTATIONS:

Freese & Nichols presented the MAG Peak Factor on behalf of Region H Water Planning Group.

#### **APPROVE MINUTES:**

Motion by Director Davenport, Second by Director Greenberg, that the Minutes from the meeting on December 14, 2023 be approved as presented. Motion approved with all present voting aye.

## **OPEN PUBLIC HEARING REGARDING PERMIT APPLICATIONS:**

Motion by Director Goolsby, Second by Director Greenberg, to **OPEN** a public hearing regarding applications for permits. Motion approved with all present voting aye.

Туре	Owner	Address	City	Allocation	Use
a.Permit New	Pomona HOA	2501-1/2 Seckel Street	Manvel	9,000,000	Lake
b.Permit Exist	Patricia Pugh	4398 CR 197	Alvin	1,000,000	Commercial
c.Permit Exist	Gul Limited Partnership	21620	Manvel	1,000,000	Commercial

## **CLOSE PUBLIC HEARING REGARDING PERMIT APPLICATIONS:**

Following the Public Hearing, there was a Motion by Director Greenberg, Second by Director Goolsby, that the public hearing regarding applications for permits received be **CLOSED**. Motion approved with all present voting aye.

#### APPROVE PERMIT APPLICATIONS:

Motion by Director Davenport, Second by Director Greenberg, that items b and c be approved as presented and item a; be approved contingent upon payment of all fees due per the District's adopted Fee Schedule and resolution of any pending issues. Motion approved with all present voting aye.

#### **EXEMPT USE WELL REGISTRATION REPORT:**

The Exempt Well Registration Report for the current period was reviewed. No action was taken.

## **DROUGHT MONITOR REPORT:**

The U.S. Drought Monitor map for the State of Texas for the current period was presented for review. No action was taken.

## APPROVE USE OF MAGE PEAK FACTOR IN 2026 REGIONAL WATER PLAN:

Motion by Director Goolsby, Second by Director Davenport, to approve the use of a MAG Peak Factor in Brazoria County in the 2026 Regional Water Plan. Motion approved with all present voting aye.

## APPROVE ORDER OF GENERAL ELECTION:

Motion by Director Davenport, Second by Director Greenberg to approve the Order of Election for May 4, 2024. Motion approved with all present voting ave.

#### SET HEARING DATE FOR PERMIT APPLICATIONS:

Motion by Director Greenberg, Second by Director Goolsby, that a public hearing to consider approval of permit applications, amendments, or cancellations be set for the next meeting of the Board of Directors on **Thursday, February 8, 2024 at 3:00 p.m.** in the District Office and that the applicants be notified. Motion approved with all present voting aye.

## FINANCIAL, INVESTMENT, & BUDGET STATUS REPORT:

The December 2023 Financial, Investment, & Budget Status Report was not presented for review. No action was taken.

#### APPROVE INVOICES FOR PAYMENT:

Motion by Director Davenport, Second by Director Goolsby, that the invoices presented be approved for payment. Motion approved with all present voting aye.

#### **GENERAL MANAGERS REPORT:**

A. Field Coordinator's Monthly Report was reviewed.

B. 4 H Annual Report was reviewed.

#### **ADJOURN:**

With no further matters to be heard, the motion to adjourn was made by Director Greenberg, Second by Director Davenport. All present voting aye. The meeting was adjourned at 4:31 p.m.

Approved this 8th day of February, 2024 Board of Directors

Groundwater Management Area 14 Meeting Minutes February 29, 2024

## UPPER GULF COAST AQUIFER PLANNING AREA (GMA 14)

#### **Joint Planning Group Meeting**

#### Thursday, February 29, 2024 10:00 AM

#### **MEETING MINUTES**

A regular meeting of GMA 14 was held Thursday, February 29, 2024, at 10:00 AM, at the offices of the Lone Star Groundwater Conservation District located at 655 Conroe Park North, Conroe, Texas.

#### Agenda Items 1, 2 and 3

The meeting was called to order by John Martin (Southeast Texas GCD) at 10:01 AM. Mr. Martin proceeded with confirmation of receipt of posted notices from District Representatives. Districts represented included: Zach Holland, Bluebonnet GCD; Beverly Hopkins, Brazoria County GCD; Sarah Kouba, Lone Star GCD; Gary Ashmore, Lower Trinity GCD; and John Martin, Southeast Texas GCD. Participants included: Ashley Grueter, Fort Bend Subsidence District; Kirk Hannath, Washington County (joined at 10:05AM); and Mike Turco, Harris-Galveston Subsidence District. Also, in attendance at the meeting were Jennifer Badhwar, Texas Water Development Board (TWDB); Daryn Hardwick, TWDB; Philip Taucer, Region H Consultant; and members of the public. (*See <u>Attachment "A" for a list of attendees</u>*). Mr. Martin welcomed those in attendance and introduced GMA members and Participants.

#### Agenda Item 4

Mr. Martin called for and opened the floor to public comment. Mr. Harry Hardmann, representing the City of Conroe as a City Council Member. Mr. Hardmann commented as the largest stakeholder in Montgomery County and one of the largest stakeholders in GMA 14, the City is in full support of the Lone Star GCD's ongoing subsidence study especially as it relates to the coring sampling currently underway. The issue of subsidence and the highest practicable use of groundwater has been a highly debated topic for several years and Lone Star GCD's commitment to devoting resources necessary to core all our aquifers across Montgomery County will allow GMA 14 to make decisions based on hardcore data not on suppositions and models of samples from 50-miles away. The City appreciates core site provided and San Jacinto River Authority for providing a second site for coring. The City has also volunteered a site in support of the study. Having quantifiable data regarding the compaction of Jasper and other aquifers in the northern portion of the GMA is critical to ensure decisions regarding fair equitable allocation

of our most precious resource are based on science and not opinion. Mr. Hardmann applauded Lone Star GCD's leadership in this initiative and urged all GCDs in GMA to support this project.

Mr. Garry Dent, Lone Star GCD Director and individual resident of Montgomery County. Mr. Dent commented on an upcoming agenda item presentation about the DFC and how it is calculated. Mr. Dent noted the current calculation uses either the lowest perforation or well screen as the depth. Mr. Dent asked the group to consider changing the metric for calculation from well depth to the bottom of the aquifer. Mr. Dent noted his support for reconsidering how the parameter is calculated.

Mr. Mark Meinrath, representing himself (*See <u>Attachment "B" for Meinrath Handout</u>*). Mr. Meinrath commented he is a 30-year resident of the Panther Branch Fault. Mr. Meinrath asked the GMA to take over the monitoring of the route of the GRP pipeline. Mr. Meinrath believes it is in everyone's best interest to maintain more frequent monitoring as San Jacinto River Authority is planning to reduce the monitoring schedule. The handout provided includes analysis of elevation data from the eight and a half years of the GRP delivery of surface water to The Woodlands. Mr. Meinrath noted the changes in measurements over time and how the measurements and movement relate to the pipeline. Mr. Meinrath reiterated the need for frequent monitoring and encouraged the GMA to consider taking over the monitoring efforts. Ms. Kouba noted this effort may be better suited to be further discussed locally and appreciated Mr. Meinrath bringing the issue forward.

## <u>Agenda Items 5</u>

Mr. Martin then asked for consideration of the approval of the minutes from the GMA 14 meeting on October 26, 2023. Mr. Ashmore moved to approve, seconded by Ms. Hopkins, the minutes as presented for the October 26, 2023 meeting were approved.

## Agenda Item 6

Mr. Martin called for updates from the TWDB and discussion of any related items of interest to GMA 14. Mr. Hardwick introduced Ms. Jennifer Badhwar as a new member to the groundwater technical assistance team, announced the recent release of GULF23 as the approved groundwater availability model for use in joint planning, reiterated the opportunity for submitting an alternate model, updated DFC flow chart, and spring-summer timeline for posting of Chapter 356 proposed changes.

## Agenda Item 7

Mr. Martin called for the presentation by Lone Star Groundwater Conservation District regarding assessment of water levels in GMA 14. (*See <u>Attachment</u> "C" for 2023 Artesian Head Change Update*). Mr. James Beach, Lone Star GCD consultant, provided update GMA 14 stakeholders of artesian head change and water level change with first focus on Montgomery County and across

GMA 14 area. Mr. Beach noted Dr. Hutchison provided an approach at a prior meeting from a modeling perspective and this presentation provides another assessment looking at the DFC metrics. Mr. Hanath asked about the pumping levels referenced and Mr. Beach noted source data from TWDB and Lone Star GCD metered data. Mr. Ashmore asked dating back to his start in 2014 about the mission of Lone Star GCD being to lower groundwater pumping rates and the current mission changes or amendments. Ms. Reece, Lone Star GCD attorney, answered Lone Star GCD had adopted a management goal of sustainability early on in its formation around 2005 with conversion requiring all large water users to convert to no more than 70% of their 2009 total qualifying demand by District rule. The rule was legally challenged and invalidated by the court of law. Mr. Ashmore asked who challenged the rule. Ms. Reece provided several public water suppliers, municipalities, and key stakeholders in Montgomery County. Before the rule was invalidated, the DFC petition had been initiated and the old board had changed the management standard from sustainability to reasonable drawdown or something similar. Technically the rule was invalidated after the management goal was changed and it is illegal for the rule to be enforced. Mr. Ashmore clarified that groundwater reduction is no longer part of the management plan. Ms. Reece stated the management plan is following Ch. 36 which is the DFC needs to be the balance between the highest practicable level of production and conservation as the adopted management standard and achievement of the approved DFC.

Mr. Hanath asked if any GCDs are looking at the use of surface water or development of new surface water use as additional offsets to the use of available groundwater resources. Mr. Hanath asked about goals or solutions of conversion and balancing groundwater and surface water use for communities and addressing growth. Mr. Hanath noted the primary use of the two main cities in Washington County being surface water which contributed to the discussion and ultimate defeat of their local GCD consideration. Mr. Martin noted the extreme differences between areas with so many elements involved. Mr. Martin noted with the availability of surface water in his area, his communities are too small to cost effectively utilize surface water, with cost and value of water as primary factors. Ms. Hopkins noted several entities in her area who are reliant on surface water and the conversion is at the forefront of the community minds. Ms. Kouba noted the balancing of blending groundwater and surface water with the extreme costs of surface water and policy decisions. Ms. Kouba noted appreciation for the presentation just received that shows maximum available drawdown and we're still achieving our DFC to help stakeholders. Mr. Holland noted the City of Huntsville's use of surface water, blending groundwater, and the benefit of an established surface water infrastructure rather than retrofitting later which is certainly a cost issue but also a water chemistry and complete infrastructure issue. Mr. Holand added the retrofitting or adding surface water infrastructure has been a discussion and consideration on the southern end of the Bluebonnet GCD, but treatment of the source to effectively blend into the system has been a major factor. Ms. Kouba noted that this is not just a surface water discussion but other alternative sources of water as well highlighted by conferences, panels, and seminars to find cost effective balance. Mr. Ashmore noted the City of Livingston, in response to potential subsidence, fully converted from groundwater to surface

water. Mr. Ashmore added Coldspring has been working and continues to work to regain surface water rights they had allowed to lapse. Mr. Ashmore noted the significance of the political pressures of surface water rights and their allocations. Mr. Hanath noted the history and discussions of Washington County surface water rights and the original creation of Lake Somerville. Mr. Hanath added the significant need for education on water and resources in response to the new residence coming from other states with vastly different laws and approaches to water.

#### Agenda Item 8

Mr. Martin then called for the update from Lone Star Groundwater Conservation District regarding data from the District's Subsidence Study Phase 3. (*See <u>Attachment</u> "D" for LSGCD <u>Subsidence Study Update</u>). Ms. Kouba noted mobilization on the first site in Porter and planning stages for the second site that will be in The Woodlands. Environmental studies will be next to be completed related to the proposed SJRA site. Ms. Kouba noted weather constraints experienced but all remains on track with the timeline. Ms. Kouba noted some misconceptions about the subsidence study and provided clarification Lone Star GCD is coring at both sites with intention of retrieving coring in Jasper, Chicot, and Evangeline and noted Montgomery County has never had coring from the Jasper. Ms. Kouba noted these efforts will be helpful in proving and putting the correct data into the new model.* 

Mr. Martin asked about the timeline for the first site drill and data. Mr. Beach noted rigs are being mobilized now and the goal for data preparation ready for the model update to TWDB as previously discussed. Mr. Martin asked about the readiness of the second site and its data use in the model update. Ms. Kouba noted potential as more of the plan is locked in, but the Porter site will be ready for use. Mr. Beach noted this is one borehole in Montgomery County but for Montgomery County purposes and the rest of the joint planning group it is really important. GULF23 was updated with the best available interpolations up from coring in Galveston and Harris County. Mr. Beach noted the 18-cores will also include the Burkeville and the subsidence data available from surface subsidence is a great starting point for looking at this issue. Mr. Beach noted one of the things that as Ch. 36 districts, Lone Star GCD, and Ms. Reece have mentioned is the consideration of the balance of the highest practicable production versus conservation which is different from the subsidence districts who are charged to stop subsidence. Mr. Beach noted the importance of coring through every aquifer is that it helps us get better science to understand where the compaction is occurring and manage the aquifer in a more refined way. Mr. Beach noted providing the best available science is what Lone Star GCD is after and building from the 1970's work locally and into the up-dip portions of the aquifer. Mr. Beach restated the reason the Lone Star GCD Board invested the money to do this study is because we don't know what the compaction is – if the compaction is worse or better than what is interpolated – the bottom line is we want the best available science for decision-making. Mr. Turco asked, as the sites are moved further up dip into Montgomery County, will there be any investigation of the Catahoula included in the study. Mr. Beach noted GULF23 model did not

include any compaction for the Catahoula and it is to be determined based on the work in the future and a topic of conversation as you move north.

Mr. Turco asked for clarification that the cores are intended to investigate the compactive properties of the units, just how they compact and capacity to compact, not determining how much or if compaction has occurred. Mr. Beach responded that is correct and there may be correlations drawn based on the compaction information received and maybe do back calculating causality or correlation in regard to historic water level declines but more as a path forward and better calibrate the model for future conditions. Mr. Turco noted the confusion and clarification in discussions on subsidence versus compaction. Mr. Hanath noted appreciation for efforts to collect more data and being driven by data.

## <u>Agenda Item 9</u>

Mr. Martin called for discussion and possible action regarding MAG Peak Factors including recommendations for Regional Water Planning Group H. (*See <u>Attachment</u> "E" for <u>Consideration of MAG Peaking Factors for the 2026 Region H Regional Water Plan</u>). Mr. Taucer provided an update to the schedule and the regional water planning process from the last meeting. Mr. Taucer re-capped the MAG Peak Factor analysis, considerations, approvals, and its use in the regional water planning process. Mr. Taucer noted a consideration for Brazoria County only this round of planning. Mr. Martin asked Ms. Hopkins if their board had been briefed and took action to approve the considered MAG Peak Factor. Ms. Hopkins confirmed her board had been briefed and approved the use of the MAG Peak Factor.* 

Mr. Ashmore made the motion to approve the MAG Peak Factor for Brazoria County contingent on its compatibility with DFC achievement, seconded by Mr. Holland. Ms. Kouba asked about a Region H comment made by Jace Houston about "fuzzy math" referring to the GMA groundwater distributed is limited to the GMA MAG – yes for regional planning strategies – but followed it up with counties are limited to MAG number – which is not the case because we are not permitting to the MAG by county. Ms. Kouba asked for confirmation we are not managing to the MAG but to the DFC. Mr. Martin and Mr. Ashmore both confirmed. The motion carried unanimously.

#### Agenda Item 10

Mr. Martin called for discussion and possible action regarding a resolution formally requesting the use of an alternate/updated groundwater availability model. (*See <u>Attachment "F" for</u> <u>Proposed Resolution Re Alternate Model</u>). Mr. Holland noted the requirement under TWDB guidance for the submittal of an alternate or updated model. Mr. Holland noted the resolution had been drafted and received comments from the working group and approved all comments, without question, prior to sending the final resolution to the entire group. Mr. Holland noted action is not required today but this is a requirement of the submittal to TWDB. Mr. Martin asked for a description of general modifications for the alternate model. Mr. Holland noted the* 

scope of work previously discussed and approved at the last meeting. Mr. Holland noted comments identifying the components of GULF23 that didn't align with historical pumping distributions, localized issues, and ultimately making the model a more useable tool for GMA 14. Ms. Kouba noted the change of adding the word "data" in the sixth "Whereas". Mr. Holland noted the group was only provided the complete version with all additions included so there are no redline changes. Mr. Holland noted that if you're not updating data, you're not updating a model and reiterated all comments and suggestions made by Ms. Reece, Mr. Beach, and the consulting conglomerate were accepted without question to provide a complete resolution.

Mr. Martin noted a grammatical issue in the "Now, Therefore" section and adding signature lines as necessary amendments. Mr. Turco noted in the fourth "Whereas" an amendment to read "the US Geological Survey has completed an updated groundwater flow model of the area in cooperation with the Harris-Galveston Subsidence District and the Fort Bend Subsidence District known as the GULF23 model".

Mr. Holland noted the need to have hard discussions now before moving forward with the resolution on the coordinated effort moving forward because we are getting to a time where we don't have any wiggle room in our schedule to get the alternative approach approved. Mr. Holland noted the options of proposing and approving our alternate model update or we work with GULF23. Mr. Holland noted the pending and vital availability of local Montgomery County data focus but that the general scope addressing the CSUB package for the regional effort is not lost, making sure to keep the GMA 14 perspective and approach. Mr. Holland noted he is not diminishing, demeaning, or minimizing the localized data efforts but we are getting into a tight time slot. Mr. Holland asked if it would streamline and be more beneficial alternative to turnover and let Lone Star GCD lead and follow and be the primary consultant for all of the work or continue on the group conglomerate of consultants. Mr. Holland noted we need finalization and commitment by everybody to try to achieve or that we will be working with GULF23. Mr. Martin asked if model update materials can be completed and ready for submission once the coring data is collected or submitted in the case the coring data is not collected timely due to weather conditions or delays. Mr. Holland noted the documentation with TWDB in the last year of issues with GULF23 for use as a regional model. Ms. Kouba noted confidence the simulations will be run with the coring data to update with the best available data and science for the new model. Ms. Kouba noted no concerns about the timeline because we don't want to get stuck with the model that we have presently. Ms. Kouba noted we can make changes and extrapolate the data into the model and confidence with the plan. Ms. Kouba noted the practical level of timelines of submissions to TWDB but just because the coring is happening only in Montgomery County doesn't affect the entire GMA is irresponsible not to add it to the model. Mr. Holland noted no disagreements with any points, but the biggest piece is having the intentional dialogue of keeping this regional -outside of the localized, individual efforts Lone Star GCD are going through – we have a regional model that has to be fixed, the options are update or work with GULF23. Mr. Beach noted his appreciation for the hard discussions on timeline and echoed

confidence the data will be collected. Mr. Beach noted identified errors in the way the delay beds and no-delay beds were implemented in some areas as part of the regional fix. Mr. Beach noted working in DFC planning around the State, there is a time to discuss the nine factors, a time for runs, and we feel because of where we ended up last time with issues, a lot of discussions that can occur of philosophies, approaches with each factor prior to any modeling. Ms. Reece asked Mr. Beach, although the coring sites are only in Montgomery County, if the data collected could be helpful for informing regional assumptions and datasets beyond Montgomery County. Mr. Beach noted the agreement is more globally applicable than just Montgomery County.

Mr. Ashmore noted he understands the lack of commitment to dates for submitting or providing things but would like to see and review our timeline for DFCs and a date schedule from Lone Star GCD that says if we pass this date we are moving forward and not holding up the process. Ms. Kouba noted the coring study is already moving forward. Mr. Ashmore clarified that he needed to see an estimated schedule of what you think you will be able to get, by when, something in writing and overlapped with the DFC timeline. Mr. Martin asked for confirmation of the proposed and final DFC dates. Ms. Reece noted May 2026 and January 2027. Ms. Reece noted discussions from previous meetings as long as the model is submitted in 2024 we would have it before model runs in 2025. Ms. Reece noted Mr. Beach's comments that there are factors and discussions to be had without simulations like in previous rounds. Ms. Reece noted Mr. Beach is suggesting that we consider looking at more than just a couple factors but all factors discussing them policy wise, conceptional wise before doing simulations but that is for you to decide.

Mr. Holland noted there are two different tracts being discussed – the simulations are one component of the overall work to be considered and the modeling update effort is separate and apart from the DFC factors. The model update must be done by the end of the year, which is his concern, and can we have the commitment to maintaining that regional perspective on the regionalized model and not get hung up in the localized pieces. Mr. Holland noted the coring samples are going to be phenomenal in in extrapolations from the existing sites across more of the up-. Models are not a simple, easy thing to tinker and mess with, much less do all the documentation required for submission to TWDB. Mr. Holland noted the time taken for GULF23 to be approved. Ms. Kouba noted it is worth considering the alternative. We are having to get this done and get this information into the simulation and get the model updated with the proper, most, and best available science that we have which is our mandate and that we are charged with and responsible for doing in our positions. Mr. Holland noted he is not to be interpreted of trying to abandon these efforts. Mr. Holland noted having the commitment and being very intentional with that across the board at this table and this GMA perspective of fixing the regionalized model. Mr. Beach noted there is no doubt the regional fixes identified have to be done and while data is being collected. If for some reason we don't get the data in time, the regional fixes will be ready to be implemented for the TWDB submittals. Mr. Beach noted the commitment to addressing the regional issues in the schedule. Ms. Reece noted as long as it is

approved prior to submitting proposed DFC and the well file associated with the proposed DFC all is fine. Mr. Holland confirmed and noted that to get the update approved for use in this cycle we have to get it in before the end of the year. Ms. Reece asked where that firm deadline is based. Mr. Holland noted the TWDB guidance document provided and the GMA timelines. Ms. Reece asked Mr. Hardwick who noted no hard deadline just time to work with it to provide proposed DFCs in 2026. Ms. Kouba asked with respect to the question whether the coring is just for Montgomery County or if it does affect the regional planning, what are individual opinions. Mr. Ashmore asked who is paying for the work. Ms. Kouba answered Lone Star GCD. Mr. Ashmore noted the opinion the information is for Lone Star GCD only and the motivation.

Mr. Ashmore noted we have a model and a process and there is a history of making exceptions and exceptions for Lone Star GCD and what they want. Mr. Ashmore noted the wasted time and money and reiterated he is asking for something in writing, this is what we're going to do and overlap with our DFC plan and make sure it works out. Mr. Ashmore noted he is 100% for Lone Star GCD gathering data and 100% for considering it and moving it into our plan – 100% don't think I'm not. Mr. Ashmore noted he wanted a commitment from Lone Star GCD that you meet your timeline. Mr. Martin asked if our consultants could get together to draw out a timeline with check off items, core samples, model updates, in a relatively quick time and meet to revisit and get the concerns addressed.

Mr. Ashmore asked if the resolution must be approved today or if we can table it until we have hard dates and commitment. Ms. Kouba noted approval actions at the last meeting, and we put together the resolution. Mr. Ashmore noted at previous meetings there was not an understanding of possible schedule conflicts. Ms. Kouba noted there have been no changes to the schedule. Mr. Ashmore noted there has not been a Lone Star GCD schedule provided. Ms. Kouba noted it has been public, talked about at every Lone Star GCD Board meeting, and I have been open about the schedule and if there is confusion it can be answered. Mr. Ashmore asked for a commitment to provide the schedule, discussed at the GMA, overlap it, and there is a hard date between what the TWDB expecting and when and what we can supply, 100% support but I don't feel comfortable at this time. Ms. Kouba noted she would love to help improve confidence today to save the trouble of having the same conversation again.

Mr. Beach noted the tricky part of local versus regional decision is that whatever Lone Star GCD needs to do locally it impacts other people and others impact us in some cases. Even though the data point and money are located in Montgomery County the votes come at the regional level and Lone Star doesn't act independently with regard to DFCs. Mr. Dent noted that it may be interesting to have Mr. Beach or Mr. Keester talk on the generality within geological systems that there is more continuity laterally in the physical parameter of the rocks than there is in the dip direction. Mr. Holland noted this is the same extrapolation process currently used, with the new data moving the point from 40-miles outside Montgomery County to within Montgomery County. Mr. Holland noted the key point now is we have GULF23 to work from whether we have an update or not – whether that is an added motivation factor to get everything in and

updated. Mr. Holland noted the goal of the update was to get GULF23 to be a usable tool from a regional perspective and that is the focus to maintain and be very intentional about.

#### Agenda Item 11

Mr. Martin called for the discussion and possible action regarding the DFCs and the path forward for GMA 14. Mr. Martin suggested getting the consultants together to layout a workable project timeline for discussion. Mr. Holland noted the suggestion serving Mr. Ashmore's concerns and specifics for GMA direction to achieve goals and Lone Star GCD's schedule overlaps. Mr. Martin noted the need for having a timeline set for the DFC process and model laying everything together in one visual document. Mr. Ashmore noted that he needs to see the hard dates of the DFC process and submittals.

Mr. Martin asked the consultants for their availability and thoughts about a timeline. Mr. Beach noted he believed a timeline could be completed in a month. Dr. Hutchison noted the history of discussions and development of the model, and the objective of the model update was to see how well we work together, and today's discussions show we do not work well together, being called irresponsible. Dr. Hutchison noted his willingness to work and talk and his pessimism about the group working. Ms. Kouba apologized for the word choice, and it was not meant as a technical comment, but a style and work to use better wording. Dr. Hutchison noted the focus of building science, but a huge part of science is working together.

Dr. Hutchison noted the discussion of the resolution, how it was developed, the complete obsession of this word "data" and subsidence information that are going to put in, but when a discussion came up about how that would affect the schedule that is when irresponsible was used. Dr. Hutchison noted his concern about the schedule, identified several GULF23 fixes, key answering questions like Mr. Ashmore's of "what does this mean for my district?" which the current documentation doesn't address. All those things have been lost because the discussion for the last 25-30 minutes has been about subsidence, which is important, but all the other is important too. Ms. Kouba confirmed that if we don't consider this data and don't attempt our best effort to utilize this data, this very big piece of data, that it would be irresponsible of this group, and it is not meant to be offensive. Ms. Kouba noted we need to meet the demands and different needs of our counties and to find a way for them to work on the regional level. Ms. Kouba noted the millions of dollars invested in this effort in Montgomery County that can only be for the achievement of the DFC collectively together.

Dr. Hutchison noted he still doesn't understand the obsession with subsidence, yes, it is important, but there are so many other things that are more important to making the model a useful tool. Ms. Reece noted Mr. Beach has proved how they are working on the regional update to the subsidence package in the regional model. Ms. Reece noted everyone is working on all of this and the group is having regular calls. Dr. Hutchison noted there are no regular calls. Ms. Reece noted Mr. Beach commented on the recent call and the schedule being followed. Dr. Hutchison noted the last call a couple of weeks ago and has been waiting for a callback. Mr. Beach apologized for not responding and asked if Dr. Hutchison agreed we were working well together as a technical team. Dr. Hutchison answered no. Mr. Martin asked for Mr. Afinowicz's thoughts. Mr. Afinowicz noted willingness to work and talk through a path forward. Mr. Martin asked Dr. Hutchison if we can take a couple months to work something up tangible and at the end of two months we come back and know its not going to happen the GMA can pivot at that point. Dr. Hutchison noted he is always willing to work on this and has been pushing this for the last seven months with the extent of frustration is seeing seven months of hard work going down the drain.

Dr. Hutchison noted the subsidence data is not the issue - if it is available it is going in, if it is not there are ways to deal with that, if it comes in after we have submitted there are ways to fix that - that is not an issue and been discussed. Dr. Hutchison noted everyone is talking about this data like it is somehow a tipping point which it isn't as there are much bigger issues to the general model update. Dr. Hutchison noted the technical team met to figure out what we needed to do, the TWDB put out this guidance document last May. One of the requirements is the GMA adopt a resolution so in the discussion that we had on this GMA 14 update, the resolution requirement was mentioned. Dr. Hutchison noted he offered to take the existing example and circulate the draft with the technical team for comments to be submitted to Mr. Martin to be part of the next agenda. Dr. Hutchison noted Mr. Beach's three corrections being typos and the addition of "data" which were fine and accepted within five minutes of receipt and sent to Mr. Martin. The comments were on the level of a typo but somehow the word "data" became an issue and a big point of discussion at the last Lone Star GCD Board meeting and a big point of discussion here. Dr. Hutchison noted that is an example of how it is becoming hard to work with the people to do the science, not necessarily with Mr. Beach or Mr. Keester, or others, but this collective Lone Star GCD attitude that we have to have it our way and we are going to fight and be aggressive about absolutely everything when there was never any reason to have any kind of disagreement. Dr. Hutchison noted this is all in the last two weeks. Ms. Reece noted the Lone Star GCD Board only gave Ms. Kouba authority to approve the resolution that supported their goals and while it was discussed at the meeting, there wasn't a big deal made. Dr. Hutchison noted his disagreement and that this word "data" was extremely important to Lone Star GCD. Dr. Hutchison noted the only version of the resolution without "data" was the initial draft which was accepted immediately before sending to GMA 14. Mr. Beach noted the historical context of "data" dates back a year and Lone Star GCDs meeting with TWDB about recalibrating and updating the model.

Mr. Martin appreciated the conversation and asked about suggestions moving forward. Mr. Holland noted gathering the consultants to discuss and have a clear timeline and would volunteer to coordinate the consultant conglomerate to bring a timeline back to the group. Mr. Ashmore made the motion for Mr. Holland to coordinate with the three consultants to put a timeline together for the next meeting including the DFC process and model update, seconded by Ms. Kouba. Motion carried unanimously.

#### Agenda Item 12

Mr. Martin called for discussion and possible action regarding the next meeting date, location, and agenda items. Ms. Kouba offered Lone Star GCD offices as a potential host. Mr. Martin asked if there were any objections to the Conroe location, and there were none. Mr. Martin noted Conroe as a potential location and the date and time would be determined later.

#### Agenda Item 13

Without further discussion or comment and there being no further business, the meeting was adjourned at 12:11 PM.

PASSED, APPROVED, AND ADOPTED THIS 14th day of May, 2024

(bhn Mart-

Chairman

ATTEST:

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Secretary