



Mary K. Sahs, P.C.

attorney at law

September 25, 2020

Shannon Houston
House Natural Resources Committee

Re: HNR RFI
Interim Charge 3

Sent via email: Shannon.Houston_HC@house.texas.gov

To: Members of the House Natural Resources Committee

From: Mary K. Sahs on behalf of Kenedy County Groundwater Conservation District
P.O. Box 40970, Austin, TX 78704
marysahs@sahslaw.com
512-585-1705

Thank you for the opportunity for Kenedy County Groundwater Conservation District (“Kenedy District”) to submit comments on Interim Charge 3 concerning the joint planning process for groundwater and the achievement of the desired conditions for aquifers by groundwater conservation districts (“GCDs”). The Kenedy District encompasses Kenedy County and parts of Brooks, Hidalgo, Jim Wells, Kleberg, Nueces, and Willacy counties. It is located in Groundwater Management Area (“GMA”) 16 and Regional Water Planning Areas M and N. Under Texas Water Code section 16.060(b)(5), the Texas Water Development Board (“TWDB”) designated parts of brackish groundwater production zones (“Zones”) GCUL1 and GCML1 within Kenedy District boundaries.

The Kenedy District has played an active role in the GMA-16 joint planning process since shortly after the process began. In related action, the Board of Directors initiated rulemaking under H.B. 722 in December 2019 and continues to hold work sessions on these rules. As the rulemaking work sessions have progressed, the Board of Directors has faced the challenge of drafting rules that meet the overall goals of H.B. 722 while addressing provisions specific to the intersection of production from Zones and the GMA-16 joint planning process. Because the data underlying designation of the Zones and that reflected in the TWDB groundwater availability models must be reconciled in order to address these provisions, the Board anticipates the rulemaking and subsequent regulation of the Zones will entail complicated and costly technical analyses. Furthermore, the District’s technical expert, Dr. Venkatesh Uddameri, reports that work in this regard done piecemeal by the various GCDs in GMA-16 would likely fail to meet the goals articulated in H.B. 722.

Critical water availability issues arise in GMA joint planning and setting a DFC related to rulemaking under H.B. 722. The use of stratigraphic units for brackish groundwater delineation in the Zone designation process is inconsistent with the hydrostratigraphic unit descriptions adopted in the TWDB GAM models used for groundwater joint planning. Reconciling these water availability numbers is key to integrating the existing joint planning goals with the newer brackish groundwater production legislation goals.

The relevant provisions of H.B. 722 that make this a critical issue for GMA joint planning are as follows: Section 36.1015(e)(2) reads “withdrawals and rates of withdrawal from a designated [Zone] shall not exceed and must be consistent with the withdrawal amounts [in the Zone Designation Memo].” Section 36.1015(l) reads “the production authorized from a [Zone] is in addition to the amount of managed [sic] available groundwater . . .” Further, section (l) reads:

To the extent possible, a district shall issue permits up to the point that the total volume of exempt and permitted groundwater production in a designated brackish groundwater production zone equals the amount of brackish groundwater that may be produced annually to achieve the groundwater availability described by the development board in its designation of the brackish groundwater production zone under Section 16.060(e).

In practical terms, these provisions mean that a GCD has a certain pot of brackish groundwater within its Zone and there are x acre-feet per year available for production from that pot. That availability is set out in the TWDB Zone designation memo. The legislature wants as much as possible of the brackish groundwater in that pot to be produced. Thus, the GCD must keep track of production from each Zone (a) under HB 722 Permits (municipal and electric generation), (b) under other permits producing from the Zone, and (c) from exempt wells producing from the Zone. This is necessary because the production from a Zone is in addition to the amount of modeled available groundwater (MAG) calculated in the joint planning process for that GCD. But what if the MAG and the availability amount in a Zone are not mutually exclusive?

As mentioned, the use of stratigraphic units for brackish groundwater delineation in the Zone designation process is inconsistent with the hydrogeological unit descriptions adopted in the TWDB GAM models used for groundwater joint planning. The GAM models are used to obtain quantitative estimates of available groundwater for an adopted DFC. These water availability estimates form the basis for development of production rules and well spacing guidelines adopted by the districts to manage groundwater under their jurisdictional areas. While these comments use the Kenedy District as an example, one would expect similar issues to arise in many of the GMA joint planning group where a Zone has been designated within a member GCD’s territory.

The groundwater availability models developed for the Central and the Southern Portions of the Gulf Coast aquifer use the hydrostratigraphic delineations (Baker, 1979) and discretize the Gulf Coast Aquifer into the Chicot, Evangeline, Burkeville Confining Unit and Jasper Aquifer formations (Hutchison et al., 2011; Chowdhury et al., 2004; Chowdhury and Mace, 2003). The DFCs adopted by GMA-16 are summarized in Table 1.

Table 1: 2016 Desired Future Conditions for the Kenedy County GCD and other GCDs in the Area (Data from Bar-W Groundwater Exploration, LLC)

(Data from Bar-W Groundwater Exploration, LLC)

Entity	Drawdown (ft)				Total Gulf Coast Pumping (AFY)
	Chicot	Evangeline	Burkeville	Jasper	
Kenedy County GCD	15	99	21	21	55000
Brush Country GCD	47	76	68	69	14200 ¹ +5840 ²
Duval County GCD	78	142	95	85	27000
Kleberg County ³	8	105	11	11	4825
Nueces County ³	22	39	11	11	10040
Willacy County ³	28	85	23	23	3200

¹ Brush County GCD excluding City of Alice; ² City of Alice; ³ Areas not included in Kenedy County GCD

The delineation of the Zones in the TWDB memo is based on the stratigraphic delineations that divide the Gulf Coast Aquifer and its hydrogeological units into many stratigraphic units (Beaumont, Lissie, Willis Sands, Goliad Sands, Fleming Formation, Lagarto Clays, Oakville Sandstone, etc.). While a generic conceptual relationship between the stratigraphic units and the hydrogeological units is presented in Chowdhury and Mace (2004), and reproduced in Figure 1, on the next page, the stratigraphic units have not be separated in the GAM models and are known to exhibit wide variability across the aquifer. This fact precludes any generalization.

The use of different stratigraphic descriptions in GAM models that are required to be used for groundwater planning and management purposes and the delineation of Zones creates enormous challenges in proper implementation of DFCs and management of fresh and brackish aquifer resources. We therefore request that the Zone delineations be reconciled with the hydrogeological descriptions used in the GAM models. This change will facilitate the proper assessment of existing wells and the Zones in which they fall, and the evaluation of the impacts associated with future well permits, both within the Zones and outside the Zones in a GCD.

Staff of the TWDB have reported that the agency intends to reconcile the two datasets sometime in the future. Because some GCDs, such as the Kenedy District, are currently proactively adopting rules under H.B. 722, this information is needed sooner rather than later. Thus, a legislative directive to the TWDB and an appropriation are needed to elevate this task to the forefront.

Most obvious effect of this disconnect is the apparent double-counting of groundwater in the two efforts: joint planning and brackish permitting under H.B. 722. The GAM models used in the joint planning process to calculate the managed available groundwater (MAG) in each groundwater management area (GMA) and then in each GCD within a GMA are not designed to account for the salinity of the groundwater they are modeling. In large part, they are designed to reflect certain aquifers, generally, those in the shallower formations. Thus, in many instances, they include groundwater that has a concentration of greater than 1,000 ppm TDS. Under H.B. 30,

Zones are designated for areas that have between 1,000 ppm TDS and 10,000 ppm TDS. Once again, I will use the example of Kenedy District, but this double-counting issue is not unique to the District or to GMA-16.

System	System Epoch	Stratigraphic Units		Hydrostratigraphy Baker (1979)
QUATERNARY	Holocene	Alluvium		Chicot Aquifer
	Pleistocene	Beaumont Clay		
		Lissie Formation	Montgomery Formation	
			Bentley Formation	
		Willis Sand		
TERTIARY	Pliocene	Gollad Sand		Evangeline Aquifer
	Miocene	Fleming Formation/ Lagarto Clay		Burkeville Confining System
		Oakville Sandstone		Jasper Aquifer

Figure 1: A Generic Conceptualization of the Stratigraphy of the Gulf Coast Aquifer and the Aquifers Modeled in the Groundwater Availability Models for the Central and Southern Regions (taken from Chowdhury et al., 2004).

The Kenedy District is a case in point. Most wells in the District are used for livestock and agricultural purposes. At least 80% of these wells produce brackish water with concentrations of TDS between 1,000 and 3,000 ppm. While these are primarily exempt wells, their production volumes play a significant role in the development of the DFC for the Kenedy District. The DFC in turn relies on the GMA-16 GAM model.

The Evangeline Aquifer is assumed to be comprised of Upper Goliad, Lower Goliad and Upper Lagarto formations (Young et al., 2010). The Evangeline Aquifer is the most prolific aquifer within the District and its vicinity. It is estimated that over 90% of the wells in the Kenedy District tap into this aquifer. The geological characterization carried out as part of the GAM modeling studies conceptualized the lower Goliad, Upper Goliad and Lower Lagarto formations as a single unit (Chowdhury and Mace, 2003; Chowdhury et al., 2004; Hutchison et al., 2011) and did not present any direct geological evidence as to the presence of hydrogeological barriers between the Goliad and upper Lagarto formations. Nevertheless, GCUL1 Zone was designated in Kenedy District. This hydrogeology and well data make it likely that the MAG availability numbers calculated from the GMA-16 GAM model during the joint planning process and the availability numbers in the Zone designation number have been double-counted in Kenedy District. Because production from Zones in Kenedy County is probably a decade in the future, this double-counting will formally arise first in the context of the joint planning process. In other areas of the state, it may arise first in the context of a H.B. 722 permit application. Regardless, it must be addressed on a case-by-case basis because it is unique to the GAM and to the models and methods used in the specific Zone designation.

The Kenedy District asks that the legislature direct the TWDB to reconcile existing GAM models for all aquifers containing a Zone and to appropriate funds to allow this work to be undertaken in a timely manner.

Sincerely,



Mary K. Sahs
Outside Legal Counsel
Kenedy County GCD

Cc: Mr. Chuck Burns, President, Board of Directors
Dr. Venkatesh Uddameri, Ph.D.