The Status of Brackish Aquifer Studies in Texas

2025 Biennial Report to the 89th Texas Legislature on Brackish Groundwater Production Zone Designation

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TEXAS WATER DEVELOPMENT BOARD

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Introduction

The Texas Water Development Board (TWDB) Brackish Resources Aquifer Characterization System (BRACS) program was established in 2009 to map and characterize the brackish portions of the aquifers in Texas and provide useful data to regional water planning groups and other entities interested in developing and desalinating brackish groundwater as a new water supply. The purpose of this report is to summarize progress on brackish aquifer studies and brackish groundwater production zone designations as required by Texas Water Code § 16.060.

In 2015, the 84th Texas Legislature passed House Bill 30 (now codified in Texas Water Code § 16.060), which directs the TWDB to (1) identify and designate brackish groundwater production zones in the state, (2) determine the volumes of groundwater that a brackish groundwater production zone can produce over 30- and 50-year periods without causing significant impact to water availability or water quality for existing users, (3) make recommendations on reasonable monitoring to observe the effects of brackish groundwater production within that zone, (4) work with groundwater conservation districts and stakeholders, and (5) provide a summary of brackish groundwater production zone designations in a biennial progress report on seawater and brackish groundwater desalination activities, due December 1 of each even-numbered year.

In 2019, the 86th Texas Legislature extended the deadline to complete zone designations from December 1, 2022, to December 1, 2032, and established a groundwater conservation district permitting framework for developing water supplies from TWDB-designated brackish groundwater production zones. In January 2021, the TWDB adopted rules to implement the permitting requirements codified in Texas Water Code § 36.1015.

In 2025, the 89th Texas Legislature appropriated $840,723 each fiscal year to the TWDB for fiscal years 2026 and 2027 to conduct studies regarding the designation of brackish groundwater production zones in aquifers of the state, excluding the Dockum Aquifer. Additionally, the General Appropriations Act from the 89th Texas Legislature required the TWDB to provide a report on its progress relating to aquifer studies and brackish groundwater zone designations no later than December 1 of each odd-numbered year. This report is intended to satisfy this requirement.

Studies on brackish aquifers

The TWDB uses legislative appropriations to complete internal studies and fund contracted work to support brackish aquifer studies and brackish groundwater production zone designations.

Overall, the TWDB has completed 17 brackish aquifer studies since the passage of House Bill 30 (Figure 1), including the Woodbine Aquifer study that is in publication. Of the completed brackish aquifer studies, the TWDB completed nine internal studies and eight contractor-led studies. Brackish aquifer studies for five aquifers are currently underway, with two internal TWDB studies (Table 1) and two contracted studies (one of these studies includes two aquifers; included in Table 2).

The TWDB will complete three additional studies for aquifers that meet statutory criteria and are eligible for zone designation (Figure 2). The remaining 12 aquifers that do not meet statutory criteria for zone designation will also be characterized after meeting the December 1, 2032, legislative deadline for completing zone designations for qualifying aquifers.

In fiscal years 2024 and 2025, the TWDB completed an internal brackish groundwater study for the Woodbine Aquifer. At the time of this report, the Woodbine brackish aquifer study report is in publication and will be the 17th report when published. The TWDB funded seven contracts totaling approximately $1.6 million to support the completion of BRACS studies (Table 2). Four of the seven contracts are either near completion or ongoing. The three contracts totaling $50,000 are completed.

Table 1. TWDB brackish aquifer studies currently in progress

Aquifer	Estimated completion	Scope of work
Edwards-Trinity (Plateau) Aquifer	Winter 2026	Evaluate publicly available water well records, geophysical well logs, and geologic reports, and enter the information into the BRACS Database. Map brackish aquifers and their hydraulic properties.
Dockum Aquifer	Fall 2027	Estimate salinity of groundwater from water well records and geophysical well logs. Estimate volumes of brackish groundwater. Prepare GIS files and report documents.

Note: Refer to www.twdb.texas.gov/groundwater/bracs/studies.asp for the status of brackish aquifer studies.

Figure 1. Completed and current brackish aquifer studies

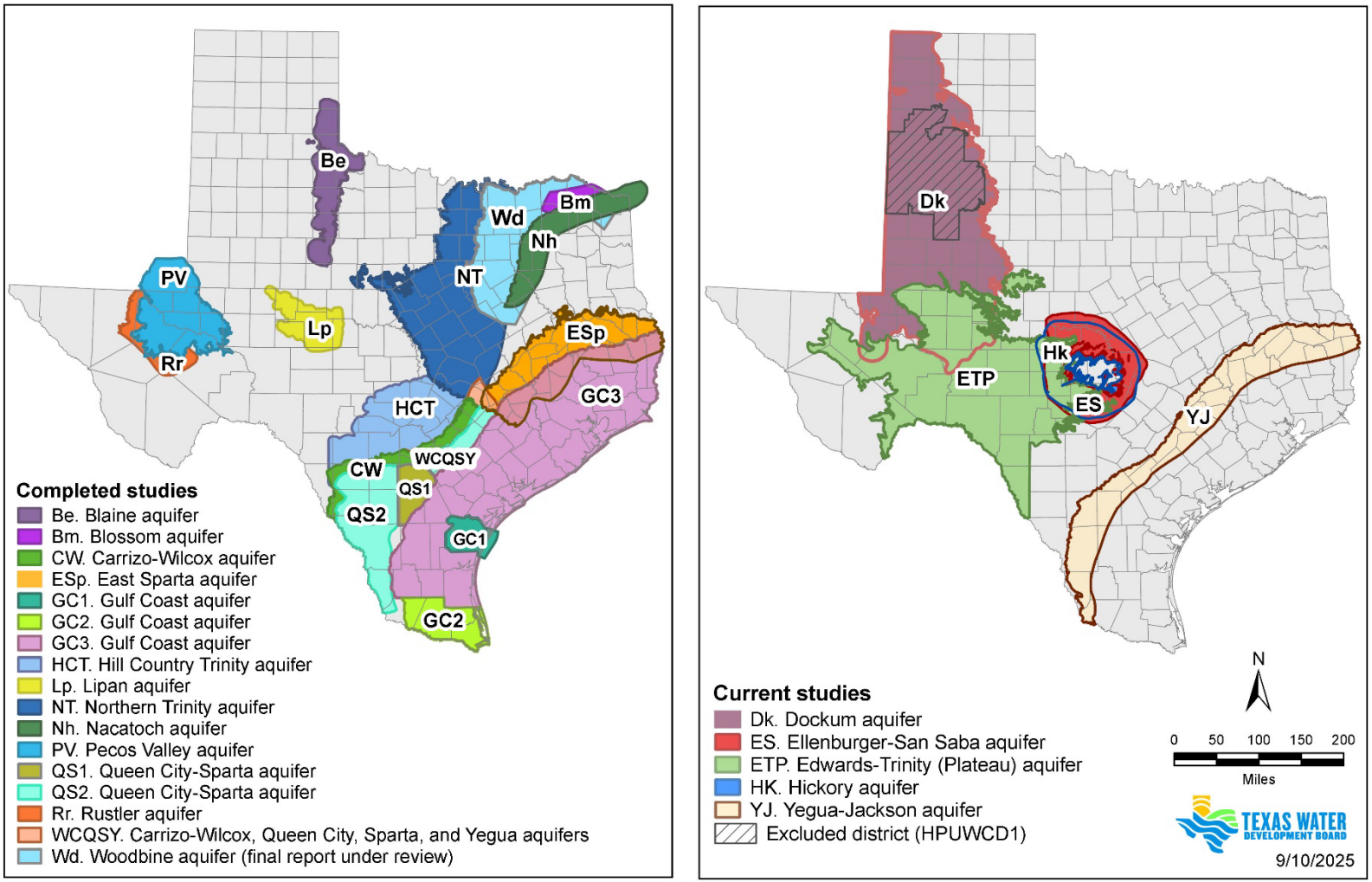
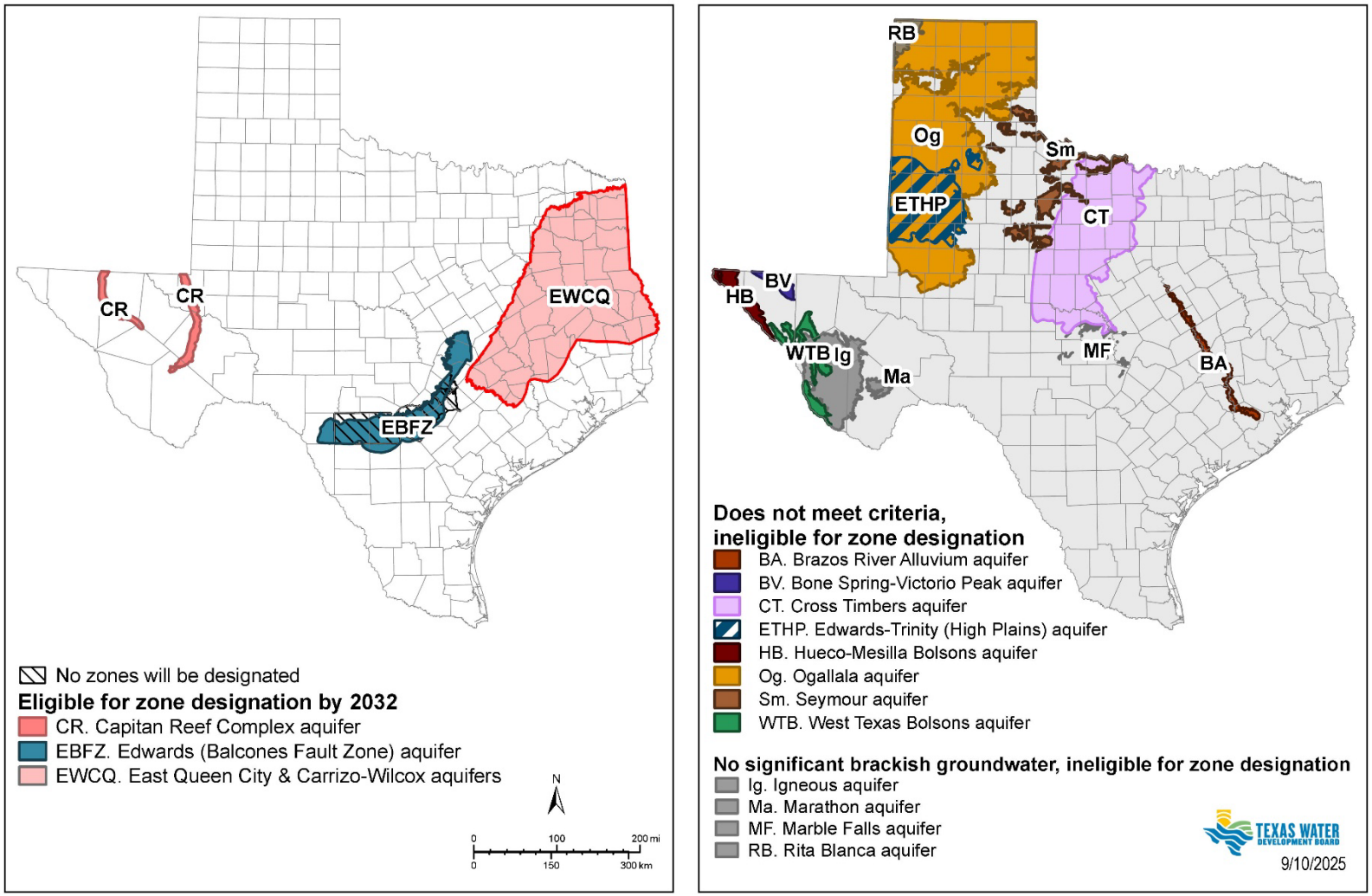


Table 2. Research studies to support brackish aquifer studies contracted in fiscal years 2024 and 2025

Study	Description	Contracted budget
Brackish groundwater pilot well with data collection funding award (data collection awarded to City of McAllen)	Survey stakeholders and recommend exploratory brackish groundwater project. Selected entity for project to collaborate with the TWDB on data collection from pilot well (geophysical data, aquifer tests, and water quality samples).	$400,000
Ellenburger-San Saba and Hickory aquifers BRACS study	Evaluate water well records, geophysical well logs, and geologic reports. Map brackish aquifers and their hydraulic properties. Estimate salinity of groundwater from water well records and geophysical well logs. Estimate volumes of brackish groundwater. Prepare GIS files, report document(s).	$400,000
Yegua-Jackson Aquifer BRACS study		$588,063
Story Map	Creation of a visually engaging interactive story map to effectively communicate the findings derived from a BRACS study.	$150,000
Mineralogic Log Analysis for the Edwards-Trinity (Plateau)	A cumulative analysis of select logs for the generation of mineralogical logs, indicating the proportion of shale, quartz, calcite, dolomite, and pore.	$15,000
State well geophysical log scanning	Scan geophysical logs from state well records in the TWDB Groundwater Database (batch one of two).	$20,000
TCEQ scanned state well reports data scraping pilot project	Hybrid approach combining AI models with proprietary software to create a spreadsheet from 1,600 scanned paper State well reports that have not been properly digitized for use in groundwater studies.	$15,000

Figure 2. Future aquifer studies eligible for brackish groundwater production zone designation and the remaining aquifers to be characterized after December 1, 2032



Note: Some aquifers and geographic areas are excluded from zone designations by statute.

Designation of brackish groundwater production zones

To date, the TWDB has designated a total of 31 brackish groundwater production zones (Figure 3). There have been no new brackish groundwater production zones designated since 2019 while the TWDB was refining methods for applying statutory criteria prescribed for zone designations. In evaluating potential brackish groundwater production zones, the TWDB may not designate zones in areas used for wastewater injection. Determining the distance that injected fluids travel is important, as TWDB staff have discovered that several Class II injection zones are installed above, below, lateral to, or overlapping with geologic strata containing brackish groundwater.

During the 89th Legislative Session, Senate Bill 2658 (authored by Senator Perry), prompted discussion about the designation and utility of brackish groundwater production zones—specifically, the application of a fixed 15-mile distance used to buffer existing Class II injection wells. While Senate Bill 2658 did not pass, the Texas Water Development Board (TWDB) took note of issues raised by legislators and stakeholders, including the San Antonio Water System (SAWS). Some stakeholders noted that this fixed buffer was overly conservative, did not reflect actual hydrogeologic conditions, and could limit access to suitable brackish groundwater areas. Similar concerns were raised during the development of House Bill 722 during the 86th Legislature, authored by Rep. Larson in 2019. At that time, budgetary and technical constraints limited the ability of the TWDB to implement a more refined mapping approach.

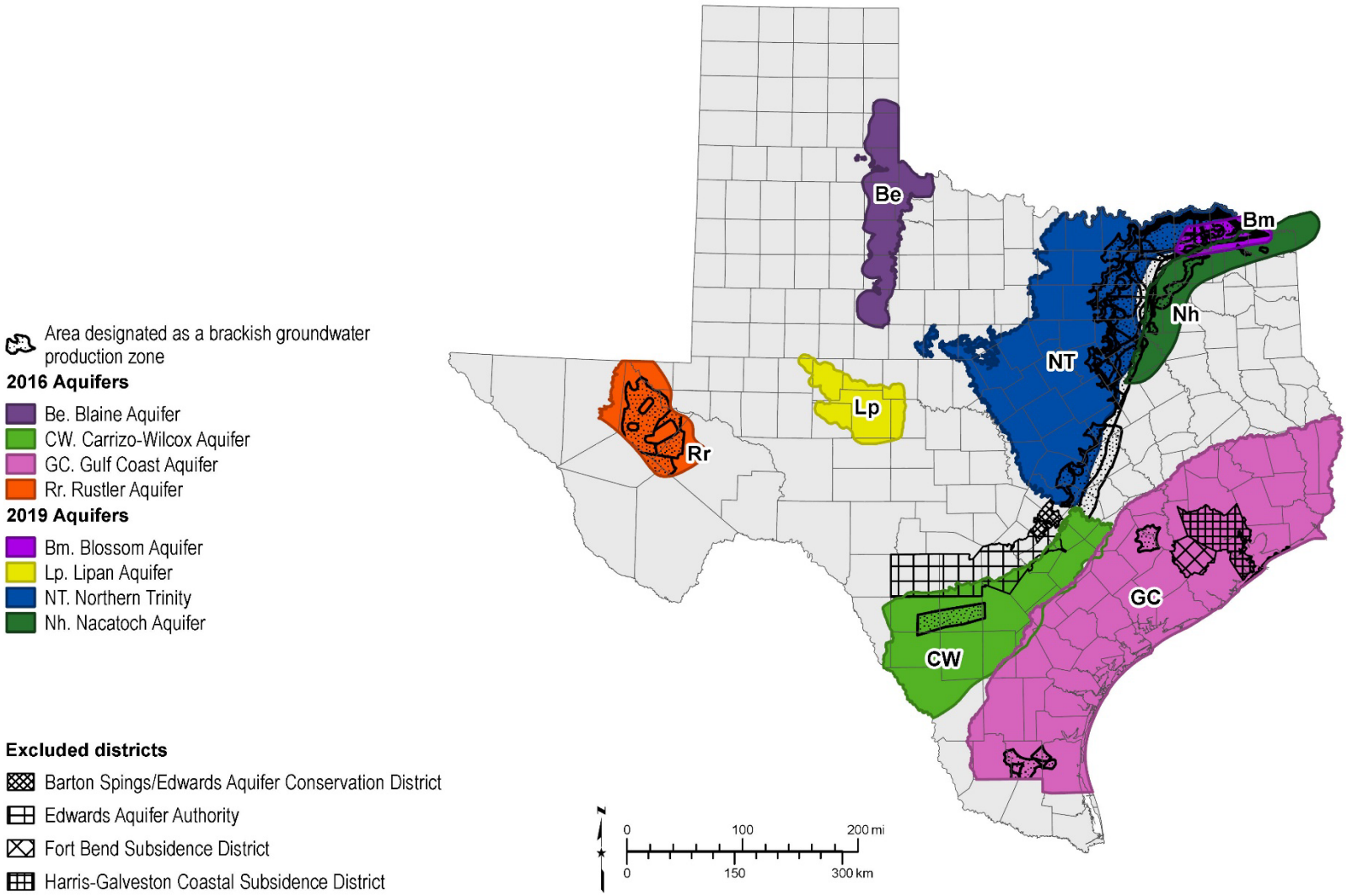
The TWDB has dedicated resources to develop and implement a new injection well buffer tool that determines buffer distances based on site-specific conditions rather than a fixed 15-mile radius. The tool incorporates such parameters as well construction, formation properties, and hydraulic gradients to model potential injectate migration, resulting in more accurate and scientifically informed buffers. The TWDB will use this tool in the development of future brackish groundwater production zone maps and in response to requests for zone amendments to ensure that designated areas remain protective and practical.

Ongoing work includes an upcoming proposal to designate four brackish groundwater production zones in the southern portion of the Trinity Aquifer. Stakeholder input will be solicited in 2026, prior to submitting the proposed zones to the TWDB governing Board for consideration.

For future work, BRACS staff and its contractors are planning to evaluate four additional brackish aquifers for zone designation using the tools and research funded by legislative appropriations, including the Pecos Valley Aquifer (study completed in 2012); Carrizo-

Wilcox, Queen City, Sparta, and Yegua aquifers of the Upper Coastal Plains in Central Texas (study completed in 2020); the East Sparta aquifer (study completed in 2023); and the Woodbine Aquifer (study completed in 2025). In addition, a reanalysis of potential production areas is planned for the southern portions of the Queen City, Sparta, and Carrizo-Wilcox aquifers using the newly available tool. Only one zone was previously designated in this area.

Figure 3. Studies evaluated for brackish groundwater production zone designation and excluded districts per statute



Status of legislative implementation

To achieve the goals of Texas Water Code § 16.060, the TWDB adheres to the following work process for current and future studies:

1. Conduct a brackish aquifer characterization study of the whole or a portion of the aquifer
2. Apply statutory requirements and exclusion criteria and evaluate areas for brackish groundwater production zone designation
3. Receive stakeholder input on proposed brackish groundwater production zones
4. Recommend proposed brackish groundwater production zones to the agency's Board for approval and designation

Study results and deliverables are made publicly available on the TWDB website. The TWDB makes reasonable efforts to engage groundwater conservation districts and stakeholders during each step of the process, allowing ample opportunities to review and comment on materials. Twice during a study, at the beginning and the end, TWDB staff provide presentations to groundwater management areas and regional water planning groups. Information pertaining to all stakeholder meetings is posted on each of the BRACS study webpages in a timely manner.

The $1,681,446 appropriated for fiscal years 2026 and 2027 from the 89th Session General Appropriations Act, Article VI, TWDB Rider 4, will be used to continue this work. The TWDB will execute contracts in fiscal years 2026 and 2027 with consulting firms qualified to perform specific tasks (such as those presented in Table 2) to support brackish aquifer studies and brackish groundwater production zone designations.