Texas Water Development Board

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TO: Board Members

THROUGH: Kevin Patteson, Executive Administrator
Robert E. Mace, Ph.D., P.G., Deputy Executive Administrator, Water Science and Conservation

FROM: Erika Mancha, Team Lead, Innovative Water Technologies

DATE: September 29, 2015

SUBJECT: Authorization to Publish a Request for Qualifications to Study Brackish Aquifers in Texas and Execute an Interagency Contract

ACTION REQUESTED

Consider authorizing the Executive Administrator to 1) publish a Request for Qualifications to study brackish aquifers in Texas and 2) execute an interagency contract with the Bureau of Economic Geology at The University of Texas at Austin to study the Carrizo-Wilcox Aquifer

BACKGROUND

The 84th Texas Legislature appropriated $2,000,000 from General Revenue to the Texas Water Development Board (TWDB) to study the characteristics of aquifers in the state (House Bill 1, General Appropriations Act, 2015 Legislature, Regular Session, page IX-87, Sec. 18.30):

> **Sec. 18.30. Contingency for HB 30 or HB 1232.** Contingent on enactment of House Bill 30, House Bill 1232, or similar legislation relating to the study of the characteristics of aquifers in this state, by the Eighty-fourth Legislature, Regular Session, 2015, the Water Development Board is appropriated $1,849,233 in fiscal year 2016 and $150,767 in fiscal year 2017 out of the General Revenue Fund in Strategy A.2.2., Water Resources Planning. Of these amounts, $1,681,446 in fiscal year 2016 shall be used for contract costs for studies related to designating priority zones for the production of brackish groundwater in the portion of the Carrizo-Wilcox Aquifer located between the Colorado and Rio Grande Rivers, the Gulf Coast Aquifers and sediments bordering that aquifer, the Blaine Aquifer, and the Rustler Aquifer, or other appropriate aquifers as identified; and $167,787 in fiscal year 2016 and $150,767 in fiscal year 2017 shall be used for administrative costs in implementing the provisions of the legislation. In addition, the "Number of Full-Time Equivalents (FTE)" in the agency bill pattern is increased by 2.0 FTEs in fiscal year 2016 and 2.0 FTEs in fiscal year 2017. The Board shall report to the Legislature on its progress relating to the studies not later than December 1, 2016.

Any unexpended and unencumbered balances remaining in this appropriation on August 31, 2016 are hereby appropriated for the same purpose in the fiscal year beginning September 1, 2016.

KEY ISSUES

To implement the $1,681,446 grant for contract costs to map and study brackish aquifers, staff proposes publishing a Request for Qualifications in the *Texas Register* for six projects and execute an interagency contract with the Bureau of Economic Geology at The University of Texas at Austin. Three projects will include studying the Gulf Coast Aquifer and sediments bordering that aquifer, the Blaine Aquifer, and the Rustler Aquifer, three of the four aquifers specifically mentioned in House Bill 30. All three projects will need to be completed by August 31, 2016, allowing time for the Board to designate the brackish groundwater production zones and provide a report to the legislature on or before December 1, 2016 as required by House Bill 30 and House Bill 1.

A study of the fourth aquifer specifically mentioned in House Bill 30 (the Carrizo-Wilcox Aquifer located between the Colorado and Rio Grande rivers) is proposed to be completed through an interagency contract. In August 2015, the TWDB contracted with the Bureau of Economic Geology at The University of Texas at Austin to study groundwater quality in the same aquifer and region to benefit the Groundwater Availability Modeling program. By expanding the scope of work on that contract to include the requirements of House Bill 30, TWDB staff can leverage and build on the work being done on the project. The Carrizo-Wilcox Aquifer study will also need to be completed by August 31, 2016.

Three other aquifers (Trinity, Blossom, and Nacatoch aquifers) will also be studied with available funds. TWDB staff selected these three additional aquifers for external funding because of their complexity. The projects will need to be completed by August 31, 2017, because of the requirement to expend funds by that date. The remainder of the aquifers in the state will be studied internally by TWDB staff and completed before the legislatively mandated date of December 1, 2022.

Details of the Request for Qualifications for the six projects are provided in Attachment A which also includes guidelines for submitting the request.

RECOMMENDATION

The Executive Administrator recommends approval of this item.

This recommendation has been reviewed by legal counsel and is in compliance with applicable statutes and Board rules.

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Les Trobman
General Counsel

Attachment A: Request for Qualifications

Attachment A

(To be published in the *Texas Register*)

Texas Water Development Board

Request for Statement of Qualifications to Study Brackish Aquifers in Texas

The Texas Water Development Board (TWDB) solicits Statements of Qualifications from interested parties to conduct studies on brackish aquifers in Texas. The solicitation is part of a requirement of House Bill 30, 84th Texas Legislative Session, for the TWDB to identify and designate brackish groundwater production zones in the aquifers of the state.

Background:
Planners and decision makers need reliable estimates of available fresh, brackish, and saline groundwater to better formulate water management strategies. Currently, the basis for determining the amount of brackish groundwater in Texas is decades-old data generated during a 2003 TWDB-funded study (LBG-Guyton, 2003, contract number 2001483395). The study helped lay the foundation for estimating brackish groundwater volumes in the state and documented that brackish groundwater is a tremendous asset in the state's water portfolio. However, the study was by design regional in scope, limited in areal extent, and narrow in its assessment of groundwater quality.

In 2009, the 81st Texas Legislature approved funding to establish the Brackish Resources Aquifer Characterization System (BRACS) program. The goal of the program is to map and characterize the brackish portions of the aquifers in Texas in sufficient detail to provide useful information and data to regional water planning groups and other entities interested in using brackish groundwater for desalination supplies. Since 2009, TWDB staff has completed three studies: the Pecos Valley Aquifer in West Texas (TWDB Report 382), Gulf Coast Aquifer in a four-county area in the Lower Rio Grande Valley (TWDB Report 383), and the Queen City and Sparta aquifers in part of a two-county area in south-central Texas (TWDB Technical Note 14-1). We also have two ongoing studies: the Carrizo-Wilcox Aquifer in a nine-county area in southcentral Texas scheduled for completion in spring 2016 and the Lipan Aquifer in a six-county area in West Texas scheduled for completion in summer 2016.

In 2015, the 84th Texas Legislature passed House Bill 30, directing the TWDB to conduct studies on and report to the legislature on a) four aquifers by December 1, 2016 and b) remaining aquifers in the state by December 1, 2022. This solicitation for statement of qualifications is for studies that require the TWDB to submit a report to the Texas Legislature by December 1, 2016 and for additional studies. The studies will also support implementation of House Bill 1232, (84th Texas Legislative Session) requiring mapping of confined and unconfined aquifers in the state by the TWDB.

There are a total of six projects in the current solicitation. A separate Statement of Qualifications is required to be submitted for each project. Three projects shall be completed by August 31, 2016 and the other three by August 31, 2017. Contract extensions for the projects will not be granted.

Details on the projects and project requirements are available on the TWDB website http://www.twdb.texas.gov/about/contract_admin/index.asp.

The deadline for applications is 12:00 PM on November 6, 2015.

Statement of Qualifications Content:
The Statement of Qualifications will include a detailed scope of work section describing each task, a percent of effort per each task, a time schedule for each task, and the amount of time each team member will spend on the project. In addition, the contractor should demonstrate they are able to meet project completion deadlines since there will be no contract extensions.

Applicants should indicate their abilities in

- general hydrogeology,
- hydrogeology of the project aquifer,
- interpreting and using geophysical well logs, as applicable to the project,
- using data from TWDB Groundwater Availability Modeling projects and other TWDB-contracted studies in the project area,
- groundwater modeling in order to evaluate potential production areas,
- geographic information system (GIS) files, use, and metadata documentation,
- communicating with the public,
- technology transfer,
- producing high-quality technical reports,
- using the TWDB BRACS and Groundwater databases, and
- meeting short and strict deadlines within budget.

The scope of work section shall not exceed 20 pages and the entire Statement of Qualifications shall not be more than 25 pages in length using Times Roman 12 font, excluding qualifications and experience of project staff and Historically Underutilized Business plan.

Grant Amount
The total grant amount for all projects in this Request for Qualifications shall not exceed $1,500,000 (this does not include funding for the proposed inter-agency project of the Carrizo-Wilcox Aquifer). All funds will need to be expended by August 31, 2017. However, three aquifers (Gulf Coast, Blaine, and Rustler aquifers) will need to be completed by August 31, 2016, allowing time for the Board to designate the brackish groundwater production zones and provide a report to the legislature on or before December 1, 2016 as required by House Bill 30 and House Bill 1.

Application Review
All applications received will be evaluated in accordance with 31 Texas Administrative Code §355.5 and may include the following factors:

- Project organization
- Project approach
- Project deliverables
- Project experience
- Team qualifications

The applicable scope of work, schedule, and contract amount will be negotiated after the TWDB selects the most qualified applicants. Failure to arrive at mutually agreeable terms of a contract with the most qualified applicant shall constitute a rejection of the Board's offer and may result in subsequent negotiations with the next most qualified applicant. The TWDB reserves the right to reject any or all applications if staff determines that an application does not adequately meet the required criteria or if the funding available is less than that requested.

Deadline for Submission of Qualifications

Six double-sided, double-spaced copies on recycled paper and one digital copy (CD) of a completed application must be filed with the TWDB on or before 12:00 p.m. on November 6, 2015. Applications can be directed either in person to David Carter, Texas Water Development Board, Stephen F. Austin Building, Room 610D, 1700 North Congress Avenue, Austin, Texas, 78701; or by mail to David Carter, Texas Water Development Board, P.O. Box 13231-Capitol Station, Austin, Texas 78711-3231.

General Requirements and Resource for All Projects

To fulfill part of the requirements of House Bill 30, 84th Texas Legislature, 2015, the TWDB is requesting Statements of Qualifications to

(1) Delineate fresh, brackish, and saline groundwater both vertically and horizontally in the aquifers of the project areas listed under The Projects.

(2) Use the groundwater salinity classification developed by the U.S. Geological Survey (Winslow and Kister, 1956) to categorize the water delineated. The classification is based on the concentration of total dissolved solids (milligrams per liter) in water and includes the following: fresh (0 to 1,000); slightly saline (1,000 to 3,000); moderately saline (3,000 to 10,000); and very saline (10,000 to 35,000).

(3) Quantify the volume of available fresh, brackish, and saline groundwater.

(4) Delineate potential production areas that are separated by hydrogeologic barriers sufficient to prevent significant impacts to water availability or water quality in any part of the same or other fresh water aquifers. These potential production areas cannot include (a) an aquifer with an average total dissolved solids concentration of more than 1,000 milligrams per liter and which is serving as a significant source of water supply for municipal, domestic, or agricultural purposes, (b) a part of a geologic stratum that is designated or used for wastewater injection through the use of injection or disposal wells permitted under Texas Water Code Chapter 27, and (c) areas within the Harris-Galveston Subsidence District and the Fort Bend Subsidence District.

(5) Meet with TWDB staff to discuss contractor-recommendations of potential production areas and develop a prioritized list of these areas for item (7).

(6) Meet with stakeholders to (1) explain TWDB's approach in implementing House Bill 30, (2) solicit feedback on what constitutes "significant impact", and (3) receive general comments concerning implementation of the legislation. Note that contractors will not be making recommendations to the Board to designate brackish groundwater production zones; only the TWDB Executive Administrator will make these recommendations.

(7) Determine the volume of brackish groundwater that the potential production areas are capable of producing over a 30-year and a 50-year period without causing significant impact to water quality and quantity as described in item (4).

Resources:

The BRACS Database was developed to store and analyze well data for the completed BRACS studies. TWDB Open-File Report 12-02, Second Edition is a data dictionary for the BRACS Database. It describes the data objects or items in the database for the benefit of the user. In addition, previous and ongoing studies of the Groundwater Availability Modeling program have direct applicability to BRACS studies.

The Projects

The six projects for which the TWDB is seeking Statement of Qualifications are:

Project 1

Project Name:	Gulf Coast Aquifer
Project Cost:	$500,000
Project Area:	Gulf Coast Aquifer and adjacent strata (Catahoula Formation) that extend from the Texas-Louisiana border to the southern county lines of Brooks, Jim Hogg, and Kenedy counties and from the outcrop areas of these aquifers to the Gulf of Mexico.
Project Timeline:	This project must be completed no later than August 31, 2016. Contract extensions will not be granted.

Additional resources:

- "Hydrogeochemical evaluation of the Texas Gulf Coast Aquifer system and implications for developing groundwater availability models" (Young and others, 2014, TWDB contract 1148301233),
- "Updating the hydrogeologic framework for the northern portion of the Gulf Coast Aquifer" (Young and others, 2012, TWDB contract 1004831113),
- "Hydrostratigraphy of the Gulf Coast Aquifer from the Brazos River to the Rio Grande" (Young and others, 2010 TWDB contract 0804830795),
- "Groundwater resource evaluation and availability model of the Gulf Coast Aquifer in the Lower Rio Grande Valley of Texas" (Chowdhury and Mace, 2007, TWDB Report 368),
- "Groundwater availability model of the central Gulf Coast Aquifer system: numerical simulations through 1999" (Chowdhury and others, 2004),
- "Hydrogeology and simulation of groundwater flow and land-surface subsidence in the norther part of the Gulf Coast Aquifer system, Texas, 1891-2009" (Kasmarek, 2013, U.S. Geological Survey Scientific Investigations Report 2012-5154),
- An alternative model "Groundwater management area 16 groundwater flow model" (Hutchison and others, 2011) was prepared for the Gulf Coast Aquifer.
- TWDB staff is working on a groundwater model for the Gulf Coast Aquifer in groundwater management areas 15 and 16 scheduled for completion in December 2016.

Project 2

Project Name:	Blaine Aquifer
Project Cost:	$200,000
Project Area:	Blaine Aquifer, extent defined by the TWDB
Project Timeline:	This project must be completed no later than August 31, 2016. Contract extensions will not be granted.

Additional resources**:**

- "Groundwater availability model for the Seymour Aquifer" (Ewing and others, 2004, TWDB contract) that includes Permian formations in layer 2.

Project 3

Project Name: Rustler Aquifer
Project Cost: $200,000
Project Area: Rustler Aquifer extent defined by the TWDB
Project Timeline: This project must be completed no later than August 31, 2016. Contract extensions will not be granted.

Additional resources:

- "Groundwater availability model report for the Rustler Aquifer" (Ewing and others, 2012 TWDB contract 0904831000).

Project 4

Project Name: Trinity Aquifer
Project Cost: $400,000
Project Area: The northern and southern extent of Trinity Aquifer defined by the TWDB downdip until the total dissolved solids concentration in the aquifer transitions to at least 10,000 milligrams per liter.
Project Timeline: This project must be completed no later than August 31, 2017. Contract extensions will not be granted.

Additional Resources:

- "Updated groundwater availability model of the northern Trinity and Woodbine Aquifers" (Kelley and others, 2014),
- "Groundwater availability model for the Hill Country portion of the Trinity Aquifer System, Texas" (Jones and others, 2009), and
- "Northern Trinity/Woodbine aquifer groundwater availability model" (R.W. Harden and Associates and others, 2004, TWDB contract 2003483483)

Project 5

Project Name: Blossom Aquifer
Project Cost: $50,000
Project Area: Blossom Aquifer extent defined by the TWDB downdip until the groundwater total dissolved solids concentration transitions to at least 10,000 milligrams per liter.
Project Timeline: This project must be completed no later than August 31, 2017. Contract extensions will not be granted.

Additional Resources:

- TWDB Report 307

Project 6

Project Name: Nacatoch Aquifer
Project Cost: $150,000
Project Area: Nacatoch Aquifer extent defined by the TWDB downdip until the groundwater total dissolved solids concentration transitions to at least 10,000 milligrams per liter.
Project Timeline: This project must be completed no later than August 31, 2017. Contract extensions will not be granted.

Additional Resources:

- "Nacatoch Aquifer groundwater availability model" (Beach and others, 2009, TWDB contract 0604830588).

Project Deliverables:

The final deliverables for the projects shall include

(1) Updated data for the BRACS Database containing all new well records used in the project.

(2) Copies of water well reports, water quality reports, and geophysical well logs used in the study (unless those reports and logs already exist in the TWDB Groundwater or BRACS databases).

(3) Three-dimensional geographic information system (GIS) datasets that delineate groundwater salinity zones using ranges of concentrations of total dissolved solids of 0 to 1,000 milligrams per liter (fresh), 1,000 to 3,000 milligrams per liter (slightly saline), 3,000 to 10,000 milligrams per liter (moderately saline), and 10,000 to 35,000 milligrams per liter (very saline).

(4) Three-dimensional geographic information system (GIS) datasets that delineate potential production areas and the estimated volumes of brackish groundwater production in 30- and 50-year timeframes.

(5) A technical report summarizing the study.

All geophysical well logs interpreted for total dissolved solids will be submitted to TWDB and all interpretation data values (input and output) will be documented in table(s) with links to well numbers, log numbers, depths, and names of geological formations in a Microsoft Access database format that can be linked to existing BRACS Database tables. Geophysical well log data obtained for the project must be non-confidential and submitted in a Tagged Image Format (TIFF) and, if available, Log ASCII Standard (LAS) format. New well control will be added to the BRACS Database with complete attributes. Water quality data will be compatible with the Groundwater Database table design and should include the source of the data.

To develop new and updated maps of the water resources, the project should use current information from a variety of non-proprietary databases and geophysical log repositories that are publicly available.

The tools and techniques used for determining the extent and volumes of the required ranges of

total dissolved solids in the groundwater shall be thorough, use defensible scientific means and approaches, and shall be documented in the technical report. The technique(s) used to determine if a potential production area is hydrogeologically separated from fresh water aquifers shall be thoroughly documented in the technical report. Each potential production area will be assigned a unique ID, and all production area attributes (ID, volume of brackish groundwater subdivided by salinity classification zones, 30-year and 50-year production calculation estimates) will be recorded in a Microsoft Access database table, in supporting GIS files (top, bottom, and lateral extent), and in groundwater modeling files.

The calculated volumes of groundwater within each aquifer and each TWDB-prioritized potential production area will be organized by salinity classification zone, county, groundwater conservation district, and groundwater management area. All GIS data shall be thoroughly documented with metadata including source, field descriptions, and units (as applicable) and use BRACS program-naming conventions and map projection parameters. Geologic formation top and bottom raster surfaces, net sand raster maps, salinity classification zone top and bottom raster surfaces, proposed production area top and bottom raster surfaces, well control point files, and project raster snap grid will be submitted to TWDB. All raster surfaces will share the same map projection and snap grid attributes. TWDB staff must be able to replicate the volumes estimated and techniques used to determine the extents of each of the salinity classification zones. All potential production area modeling files will be submitted to TWDB.
All draft and final reports shall be delivered in Microsoft Word and PDF formats. Draft deliverables will be submitted for review and comment by TWDB staff. These comments will be incorporated into the final deliverables. Training for TWDB staff shall be provided, as needed or requested.

The BRACS program contract data requirements-document is available on the TWDB website and includes information on GIS data and map projection standards, BRACS Database standards, well report and geophysical well log file naming and organization standards, and other useful information.

Project Monitoring:

At a minimum, TWDB staff expects to meet with the project team (Contractor Meetings) four times during the project and conduct two stakeholder meetings.

Contractor Meetings

(1) Project initiation, at the beginning of the project.

(2) Discussion and approval of project methodology, date to be determined by the contractor.

(3) Discussion of potential production areas and prioritization for production calculations date to be determined by the contractor.

(4) Project completion, at the end of the project.

Additional technical meetings may be scheduled either in person, through a webinar, or teleconference venue to discuss project progress and issues. TWDB staff may periodically visit the contractor's work premises to assess progress on the project.

Detailed monthly progress reports must be submitted to the TWDB outlining progress of the project and include the original or adjusted schedule and how the project is progressing relative to this yardstick. Project invoices cannot be processed without detailed descriptions of the progress made by tasks. Each of the project tasks must be described in detail consistent with the budget description. We expect issues to be reported to the TWDB contract manager immediately as they appear. Maintaining close coordination with TWDB staff throughout the project will be critical.

A draft report documenting the technique(s) and approaches selected by the contractor for geophysical well log interpretation of aquifer total dissolved solids concentration shall be given to TWDB staff for review at a date determined by the contractor. The report shall include information on the types of geophysical well logs available in the project area, how the interpreted total dissolved solids concentration from geophysical well log analysis relates to existing aquifer water chemistry as determined by direct measurements (including specific examples), how the log correction factors are determined, and how the interpretation techniques will be applied across the entire salinity range within the aquifer. TWDB staff will have up to 10 business days to review the draft report, and the contractor will schedule a meeting to discuss the techniques (Contractor Meeting 2, above).

A meeting to discuss the potential production areas (Contractor Meeting 3, above, and Stakeholder Meeting 2, below) at a date determined by the contractor shall be made prior to the end of the project. Potential production areas will be prioritized for the 30-year and 50-year pumping estimate task with input from stakeholders.

A formal presentation on the results of the project (Contractor Meeting 4, above) shall be made to TWDB staff at the end of the project.

Stakeholder Meetings

For each project, two formal stakeholder meetings shall be scheduled.

1) The first meeting will be a general meeting held in Austin, Texas, to explain TWDB's approach in implementing House Bill 30; solicit feedback on what constitutes "significant impact", and; receive general comments concerning implementation of the legislation.
2) The second meeting will be held at the end of the project in the study area to provide information on the results of the project and to solicit input on the potential production areas.

TWDB staff will organize the meetings and invite stakeholders including at a minimum all the groundwater conservation districts within the project area. The contractor will attend and make a presentation at the second stakeholder meeting.

Texas Water Development Board
Guidelines for Statement of Qualifications

I. GENERAL INFORMATION

1. Legal name of applicant(s).
2. Legal name of each participant.
3. Applicant's Official Representative, Name, Title, Mailing Address, Phone Number, Fax Number, if available, e-mail Address, and Vendor ID Number.
4. Is the application in response to a Request for Statement of Qualifications in the Texas Register?
   Yes □ No □
5. If yes to number 4 above, list document's number and date of publication of the Texas Register.
6. A brief description of the research proposal (not to exceed 1 page).
7. A list of potential users and their possible involvement with the research.
8. Are you an individual member of the Texas Water Development Board, a Board staff member, or a member of their immediate families?
   Yes □ No □
9. Please include a completed Historically Underutilized Business Subcontracting Plan. The forms are available at: http://www.window.state.tx.us/procurement/prog/hub/hub-subcontracting-plan/

II. RESEARCH PROJECT INFORMATION

- A detailed scope of work describing each task, a percent of effort per each task, a time schedule for each task, and the amount of time each team member will spend on the project (not to exceed 20 pages using Times Roman 12 font).
- A description of project-monitoring procedures.
- Qualifications and experience of project staff that are directly related to this project only.
- A description of the project deliverables (reports, plans, or other products) that the Board will receive as a result of this project.

III. WRITTEN ASSURANCE

Written assurance of the following item:

- Proposed water research does not duplicate previously completed or ongoing research.