Texas Water Development Board

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AGENDA ITEM MEMO

BOARD MEETING DATE: September 14, 2023

TO: Board Members

THROUGH: Jeff Walker, Executive Administrator
Ashley Harden, General Counsel
Rebecca Trevino, Chief Financial Officer
John T. Dupnik, P.G., Deputy Executive Administrator, Water Science & Conservation

FROM: Natalie Ballew, P.G., Director, Groundwater
Daryn Hardwick, Ph.D., Manager, Groundwater Modeling

SUBJECT: Groundwater Modeling Program research projects

ACTION REQUESTED

Consider authorizing the Executive Administrator to publish solicitations, award, and execute contracts in a total amount not to exceed $1,680,000 for four groundwater modeling projects.

BACKGROUND

In 2023, the 88th Texas Legislature appropriated a total of $1,680,000 for Fiscal Years 2024 and 2025 to the TWDB for conducting studies regarding groundwater modeling. Each fiscal year, $840,000 of these funds must be transferred to the Water Assistance Fund No. 480 to fulfil this purpose.

These appropriations are related to a directive from the Texas Legislature in 2001 for the TWDB to obtain or develop groundwater availability models for all major and minor aquifers in Texas, and to do so in coordination with groundwater conservation districts and regional water planning groups. The TWDB has completed groundwater availability models for all 9 of the state's major aquifers and 20 of the state's 22 minor aquifers. The Groundwater Modeling Program funds are used to advance the program objective of providing the best available science by generating relevant applied hydrologic data and developing and improving groundwater models that are key to the management of groundwater resources within the state.

KEY ISSUES

The following proposed projects have been identified for funding after reviewing current groundwater availability models and evaluating the hydrologic data and modeling needs of the Groundwater Modeling Program. In proposing the projects listed below, we considered research needs identified internally, project ideas solicitated from external stakeholders, and policy recommendations provided by regional water planning groups. The TWDB will publish a request for qualifications for each study and may additionally execute one or more interagency contracts with state and/or federal agencies.

1. **Develop a Numerical Groundwater Availability Model for the Marathon Aquifer (not to exceed $500,000)**
   The Marathon Aquifer is designated as a minor aquifer in West Texas. The Groundwater Modeling Program contracted the first conceptual groundwater model for the Marathon Aquifer, which was completed in 2022. The Marathon Aquifer is the only minor aquifer where a numerical model has not been developed (the Cross Timbers Aquifer model is currently in development). Contracting the development of the groundwater availability model for the Marathon Aquifer would advance the timeline for its completion, as well as complete the goal of developing numerical flow models for every major and minor aquifer in the state of Texas.

2. **Develop a Groundwater Availability Model for the Seymour and Blaine aquifers (not to exceed $550,000)**
   The Seymour Aquifer is a major aquifer in north central Texas and the Blaine Aquifer is a minor aquifer in the east end of the High Plains in North Texas. The current groundwater availability model for the Seymour and Blaine aquifers was released in 2004. The Seymour Aquifer consists of isolated pods that are hydraulically disconnected. In 2014, a numerical groundwater model was developed for just the largest of these pods. In 2022, the Groundwater Modeling Program funded a study to improve pumping estimates for the entire Seymour and Blaine aquifers with the goal of improving the groundwater model. This pumping study is set to be completed in the summer of 2024. Contracting the development of the groundwater availability model for the Seymour and Blaine aquifers would advance the timeline for its completion, and immediately utilize data created from the ongoing pumping study.

3. **Investigate the Interaction between Groundwater and Surface Water for a Selected Aquifer in a Karst System (not to exceed $430,000)**
   Understanding interactions between groundwater and surface water, and how those interactions change over time, is important to improve the usefulness and accuracy of groundwater availability models. Areas where groundwater discharges to surface water bodies and surface water seeps into the ground can be identified through several techniques. Both the spatial and temporal aspects of these interactions will be characterized by this project. Results will be verified where possible though the use of various field methods and efforts will be made to discern where anthropogenic discharges to surface water are occurring. Areas of possible

groundwater-surface water interaction would be identified for surface water bodies that overlie an aquifer exposed at land surface and in a karst system. Currently, the TWDB is funding a similar study along the Brazos River, a sedimentary system. Focusing on a river segment in a karst system will allow for the comparison of results across a variety of geologic environments as well as deepen our understanding of these interactions and how those interactions may be applied in future groundwater availability model updates.

With the remaining $200,000 not captured by the three projects listed above, a fourth project is proposed that is yet to be defined. Additional time is necessary to further investigate the feasibility and scope of research projects proposed in the stakeholder solicitation process related to recharge, groundwater-surface water interaction, and/or uncertainty.

RECOMMENDATION

The Executive Administrator recommends approval of this item to improve our understanding of groundwater-surface water interactions in certain aquifer systems, to develop new and improve existing groundwater availability models, and to support research to improve important modeling inputs and assumptions that can be applied to future model updates and enhancements.