

Post Oak Savannah Grant Application for Groundwater Research and Science to Benefit Local and Regional Groundwater Management and Planning

175 Word Statement of Purpose

The overarching purpose of this project is to advance best available science through the development of a tool that facilitates prudent groundwater resource management and planning. The project will enhance and improve the District's **OP**erational and **MAN**agement (OPMAN) model, and eventually future groundwater availability models for GMA 12 such that they can be reliably and confidently used to help plan, design, and implement POSGCD management strategies that include: adopting appropriate and suitable Desired Future Conditions (DFCs), evaluating compliance of aquifer conditions with DFCs, establishing rules governing production that are aligned with the fair-share doctrine, developing reasonable curtailment programs, conducting efficient aquifer monitoring, evaluating groundwater sustainability, and supporting the conservation of water resources.

300 Word Summary for Category 1

This project will advance the best available science in the state and support implementation of effective groundwater resource management and planning by:

- Improving the hydrogeologic characterization of the Carrizo-Wilcox Aquifer by performing synoptic surveys of water levels to track the impacts of pumping, measuring concentrations of stable and radioactive isotopes to describe flow paths and flow rates, and interpreting geophysical logs to map hydrostratigraphic units and generate sand thickness and sand fraction maps that identify zones of lower and higher transmissivity.
- Measuring rates of subsidence from 2018 to 2025 through analysis of InSAR data across several counties, including the locations of existing large capacity wellfields (Vista Ridge, SLR, and the cities of College Station and Byran).
- Extending the OPMAN model (POSGCD's Operational Management model developed from the Texas Water Development Board's GAM for the central portion of the Carrizo-Wilcox, Sparta and Queen City aquifers) calibration period through 2022 to include the Sparta and Queen City aquifers, and converting both the OPMAN model and the GAM to MODFLOW 6. The enhancement of OPMAN and the conversion of the two models will facilitate TWDB's next update of the GAM for the central portion of the Carrizo-Wilcox Aquifer.
- Demonstrating techniques to improve calibration of GAMs by expanding beyond a single model simulation of historical pumping. The expansion includes simulating aquifer pumping tests to constrain aquifer properties at the local scale, using the differences in sand thickness and/or sand fraction as indicators of differences in aquifer transmissive properties, and using information of groundwater age to constrain groundwater flow rates and recharge rates.
- Evaluating options of interpreting water level data to evaluate DFC compliance. The most sophisticated, and perhaps also the most reliable, is a geostatistical method that incorporates results from a GAM or similar model to integrate information from modeling and monitoring.