

**Monthly Letter Progress Report #4 – June 2016
Study of Brackish Aquifers in Texas – Project No. 3 –
Rustler Aquifer**

TWDB Contract No. 1600011949

Submitted to

**Texas Water Development Board
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1.0 Budget and Expenses

This report summarizes the project costs for the billing period of June 2016. The total billed expenses through June 2016 are \$115,022. A budget breakdown by tasks is provided in Table 1. A copy of the progress report has been sent to TWDB contracts department along with the monthly invoice.

To date we have not submitted an invoice for the University of Texas and services of Dr. Carlos Torres-Verdin. We expect his charges to reach \$30,000 which implies we have approximately \$54,000 remaining for July and August.

TASK	DESCRIPTION	Budget	Invoices			Remaining Budget
			Current	Previous	Total	
1	Project Management	\$9,235	\$ 0	\$ 3,418	\$ 3,418	\$ 5,817
2	Delineate Vertical & Horizontal Extent of Fresh, Brackish & Saline Groundwater	\$97,688	\$ 4,661	\$ 44,130	\$ 48,792	\$ 48,896
3	Quantify Volume of Fresh, Brackish & Saline Groundwater	\$13,679	\$ 6,201	\$ 7,158	\$ 13,359	\$ 319
4	Delineate Potential Production Areas	\$20,532	\$ 5,487	\$ 8,228	\$ 13,716	\$ 6,816
5	Determine Availability	\$23,086	\$ 10,433	\$ 3,753	\$ 14,187	\$ 8,900
6	Final Report, Documentation & Technology Transfer	\$35,780	\$ 10,161	\$ 11,389	\$ 21,550	\$ 14,230
Total		\$200,000	\$ 36,945	\$ 78,077	\$ 115,022	\$ 84,978

Table 1. Project Budget Versus Expenses

2.0 Progress on Tasks

This report summarizes activities on project tasks through the month of June, 2016 and is the fourth progress report on this contract

Task 1 Project Management

INTERA Project Management activities have been minimal in June with activities focused on technical tasks.

Task 2 Delineate Vertical and Horizontal Extent of Brackish and Saline Groundwater

Task 2 has been subdivided into 6 subtasks. Progress made on the 6 subtasks is as follows:

Task 2.1 – Acquire and Digitize Geophysical Well Logs:

Drilling Info and Well Green submitted invoices coded to Task 2.1 in June.

Task 2.2 – Draft Techniques and Approaches Report and Meeting:

Final edits to the Methods Report were made and the report will be resubmitted to the TWDB in July.

Task 2.4 – Generate Surfaces Defining the Member Units of the Rustler:

Work continued to improve structural surfaces for the Rustler, the Magenta Dolomite, the Culebra Dolomite and the Los Medanos Limestone in June.

Task 2.5 – Formation Parameter Sensitivity Analysis:

No additional progress was made on this task.

Task 2.6 – Interpret Water Quality Based on Distribution of Resistivity:

In June Dr. Torres-Verdin continued to analyze key wells and also to develop porosity estimates for all key wells with porosity logs (neutron, density and acoustic).

Task 3 Quantify Volume of Fresh, Brackish and Saline Groundwater

In June INTERA started developing a Rustler specific tool for calculating the volume of saline and fresh groundwater within the Magenta dolomite, the Culebra dolomite, and the Los Medanos limestone.

Task 4 Delineate Potential Production Areas

Task 4.1 - Refine Hydrostructural Model and Transmissivity Estimates

No additional progress was made on this task.

Task 4.2 – Map Hydrogeologic Barriers

No additional progress was made on this task.

Task 4.3 – Identify Protected Areas

INTERA made additional progress on identifying excluded areas and our estimates of excluded areas were presented along with Potential Production Areas in a stakeholder meeting held in Fort Stockton on June 16th. Additional stakeholder data was received from Middle Pecos GCD after the stakeholder meeting to identify protected wells.

Task 4.4 – Identify Potential Production Areas

Potential Production Areas (PPAs) were delineated in June and were presented in a stakeholder meeting held in Fort Stockton on June 16th.

No work was performed on this task in through May.

Task 4.5 – Potential Production Area Meeting with TWDB

On June 22nd we had a follow-up meeting with the TWDB BRACs staff to discuss the PPAs and initial thoughts on modeling. PPA-6 was eliminated from consideration.

Task 5 Determine Availability of Brackish Groundwater in Potential Production Areas

Preliminary ideas regarding well fields and the method for modeling well fields were developed in June. On June 22nd INTERA had the first of meetings with THDB BRACS staff to review our ideas regarding well fields and to present a preliminary modeling approach as well as preliminary results. INTERA received feedback on our approach and a follow-up meeting was planned.

Task 6 Final Report, Documentation and Technology Transfer

Reporting activities in June were focused on final submittal of the Draft Methods Report and on submitting the Draft Final Report at the end of July.

3.0 Planned Activities for the Next Month

The project timeline is quite compressed on this project with a draft report due July 31st. The following section will define key expected activities that will be performed or completed in July of 2016.

Task 1 Project Management

In addition to standard project management activities, the following tasks will be performed in June as part of Project Management:

- The INTERA Team will meet with the TWDB to determine further define the modeling approach for PPAs.
- INTERA will meet with TWDB to make sure we have a good understanding of expectations for BRACS database submittal.
- All other activities will be focused on meeting project deliverables.

Task 2 Delineate Vertical and Horizontal Extent of Brackish and Saline Groundwater

Planned activities for task 2 are as follows:

Task 2.1 – Acquire and Digitize Geophysical Well Logs:

No work anticipated in this task in July.

Task 2.2 – Draft Techniques and Approaches Report and Meeting:

This work is complete. No work anticipated in this task in July.

Task 2.3 – Evaluate Structure and Lithology:

No work anticipated in this task in July.

Task 2.4 – Generate Surfaces Defining the Member Units of the Rustler:

Some work could continue on this task in July to support volume calculations.

Task 2.5 – Formation Parameter Sensitivity Analysis:

No work anticipated in this task in July.

Task 2.6 – Interpret Water Quality Based on Distribution of Resistivity:

Work will continue in July with any additional results and methods provided by Dr. Torres-Verdin.

Task 3 Quantify Volume of Fresh, Brackish and Saline Groundwater

The coding to support these calculations will be completed and documented in July.

Task 4 Delineate Potential Production Areas

Activities associated with this task will be largely documentation related.

Task 5 Determine Availability of Brackish Groundwater in Potential Production Areas

We expect to meet with the TWDB again and discuss our approach to modeling in July. This work scope will be completed in July.

Task 6 Final Report, Documentation and Technology Transfer

The draft Final Report will be submitted to the TWDB on July 31st. INTERA has been instructed by the TWDB Project Manager that the hard copies of the report can be delivered by 8 AM on Monday August 1st.

4.0 Problems/Issues and Actions Required/Taken

No problems or issues were encountered in June.