

**Monthly Letter Progress Report #14:
Period 8, Fiscal Year 2017
Study of Brackish Aquifers in Texas –
Project No. 4 –Trinity Aquifer
TWDB Contract No. 1600011950**

Submitted to

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Monthly Letter Progress Report #14
April 15, 2017-May 12, 2017
Study of Brackish Aquifers in Texas – Project No. 4 –
Trinity Aquifer
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1.0 Budget and Expenses

This report summarizes the project status and costs for the billing period from Contract Approval Date (January 6, 2016) through the end of Period 8 of Fiscal Year 2017 (May 12, 2017). The total expenses through this period are \$223,409.14. A breakdown of the budget by task is provided in Table 1. A copy of the progress report has been sent to Texas Water Development Board (TWDB) along with the monthly invoice.

2.0 Progress on Tasks

This report summarizes activities on project tasks during Fiscal Year 2017, Period 8 (encompassing April 15, 2017-May 12, 2017) and represents the fourteenth progress report on this contract.

Task 1: Project Management

No work was performed on this task during this reporting period.

Task 2: Data Acquisition and Method Development

Task 2 has been subdivided into four subtasks. Progress on activities for the subtasks is as follows:

Subtask 2.1 Acquisition and Initial Analysis of Groundwater Samples

No work was performed on this subtask during this reporting period.

Subtask 2.2 Acquisition and Initial Analysis of Geophysical Logs

Geophysical logs have been correlated with chemical-analysis data. Work on the well log database containing spatial attributes of all logs utilized in this study, with care to adhere to BRACS format, has continued. The project database of water-quality data relevant to the project domain continues to be developed. Hydrochemical facies analyses for the project are underway.

Subtask 2.3 Develop Technical Approach for Estimating Total Dissolved Solids from Geophysical Logs

The technical approach for estimating total dissolved solids from geophysical logs has been developed and is being implemented using available geophysical logs.

Subtask 2.4 Use Geophysical Log Interpretation to Analyze Stratigraphy and Map Fresh, Brackish, and Saline Groundwater

Gamma ray logs are being used to help complete the stratigraphic framework model. In addition, resistivity and SP logs are being used for stratigraphic interpretation at wells which do not have gamma ray logs. Resistivity and SP logs are also being utilized for salinity analysis. SP data are mostly limited to sand-dominated units such as the Hosston and Hensell formations, but have been effective for some Cow Creek producing zones. Digitized porosity logs (neutron and sonic) were evaluated for use in the study.

Task 3: Develop a Stratigraphic Framework Model of the Trinity Aquifer and Calculate Brackish Water Volumes

Task 3 has been subdivided into two subtasks. Progress on activities for the subtasks is as follows:

Subtask 3.1 Extend Stratigraphy for the Hill Country Trinity

The technical literature has been examined for useful and relevant stratigraphic and structural information and data (e.g., cross-sections, fence diagrams, structure contour maps, well header information, stratigraphic horizon picks from wells, and fault maps). Geophysical logs from the BRACS well database including stratigraphic information, specifically stratigraphic horizon picks and lithologic information, have been evaluated, quality controlled, and re-interpreted as needed. Log information from the IHS database has been evaluated and wells which have logs that penetrate the Trinity Aquifer were used for stratigraphic interpretation. The stratigraphic framework is nearing completion.

Subtask 3.2 Determine Volumes of Fresh, Brackish, and Saline Groundwater

Evaluation of the relationship between electrical resistivity and fluid salinity continued during this period. The determination of TDS from digitized well log curves is nearing completion.

Task 4: Delineate Potential Production Areas

Team members continued the delineation of the potential production zones.

Task 5: Determine the Amount of Brackish Groundwater that can be Produced without

Causing Impact on Lateral and Vertical Fresh Water

Team members have begun modelling groundwater within the Trinity Aquifer using stratigraphic and geochemical data to constrain the model domain.

Task 6: Stakeholder Communication

The second stakeholder meeting for this project to discuss Potential Production Areas was held on May 8th, 2017. Team members prepared and presented a PowerPoint presentation for the meeting.

Task 7: Reporting

Task 7 has been subdivided into 2 subtasks. Progress on the subtasks is as follows:

Subtask 7.1 Project Monitoring Procedures

The project timeline has been reviewed frequently. The project budget has been monitored on a weekly basis using the SwRI Project Cost System. Project activity for each period is summarized in status reports for review by TWDB.

Subtask 7.2 Project Deliverables

Progress on this task during this reporting period has included preparing and delivering “Monthly Letter Progress Report #13: Period 7, Fiscal Year 2017.”

The Stakeholder Presentation on proposed Potential Production Areas was delivered to TWDB. Team members have continued work toward completing all project deliverables. Work on the Draft Final Report has continued.

3.0 Planned Activities for the Next Reporting Period (Fiscal Year 2017, Period 8)

Task 1: Project Management

The agreements with the two in-kind teaming partners, EAA and BSEACD, will be submitted to TWDB as soon as they have been finalized.

Task 2: Data Acquisition and Method Development

Task 2 has been subdivided into four subtasks. Planned activities for the subtasks are as follows:

Subtask 2.1 Acquisition and Initial Analysis of Groundwater Samples

No work on this task is expected to occur over the next reporting period.

Subtask 2.2 Acquisition and Initial Analysis of Geophysical Logs

Geophysical logs will continue to be correlated with chemical-analysis data. Plots of regional chemistry across the study region will be created for each aquifer. The database with spatial attributes of all logs utilized in this study, with care to adhere to BRACS format, will be finalized. The project database of water quality data relevant to the project domain and preliminary hydrochemical facies analysis for the project domain will be finalized using TWDB's groundwater database.

Subtask 2.3 Develop Technical Approach for Estimating Total Dissolved Solids from Geophysical Logs

Efforts towards developing a method for correlating TDS data and geophysical log attributes will conclude. Deep and shallow resistivity curves will be cross-plotted so that the resistivity of the fluid can be estimated. Feedback from the TWDB regarding the method for correlating TDS data and geophysical log attributes will be incorporated into the approach.

Subtask 2.4 Use Geophysical Log Interpretation to Analyze Stratigraphy and Map Fresh, Brackish, and Saline Groundwater

Shallow and deep resistivity logs and SP logs will be utilized for salinity analysis.

Task 3: Develop a Stratigraphic Framework Model of the Trinity Aquifer and Calculate Brackish Water Volumes

Task 3 has been subdivided into two subtasks. Planned activities for the subtasks are as follows:

Subtask 3.1 Extend Stratigraphy for the Hill Country Trinity

The framework model will be completed over the next reporting period.

Subtask 3.2 Determine Volumes of Fresh, Brackish, and Saline Groundwater

Evaluation of the relationship between electrical resistivity and fluid salinity will conclude during the next period.

Task 4: Delineate Potential Production Areas

Work on identifying the potential production zones will be completed during the next period.

Task 5: Determine the Amount of Brackish Groundwater that can be Produced without

Causing Impact on Lateral and Vertical Fresh Water

Efforts toward determining the amount of brackish groundwater available for production without causing negative impact on lateral and vertical fresh water will be completed during the next reporting period.

Task 6: Stakeholder Communication

No work is expected to occur over the next reporting period.

Task 7: Reporting

Task 7 has been subdivided into 2 subtasks. Planned activities for the subtasks are as follows:

Subtask 7.1 Project Monitoring Procedures

The project timeline will continue to be reviewed frequently. The project budget will continue to be monitored on a weekly basis using the SwRI Project Cost System. Project activity will continue to be summarized in status reports for review by TWDB.

Subtask 7.2 Project Deliverables

The fourteenth (current) progress report (covering Period 8, FY 2017) will be submitted to TWDB during Fiscal Year 2017, Period 9.

Team members will consider and incorporate feedback regarding the Draft Methods Report from TWDB as appropriate. Work on the Draft Final Report will continue.

4.0 Problems/Issues and Actions Required/Taken

No problems or issues were encountered during this period.

Table 1. Project Budget Versus Expenses

Task	Description	Task Budget	Spent This Period Per Task	Total Spent Per Task	Remaining Task Budget
1	Project Management	\$22,640.00	\$0.00	\$16,872.03	\$5,767.97
2	Data Acquisition and Method Development	\$134,555.00	\$2,657.19	\$107,732.57	\$26,822.43
3	Develop a Stratigraphic Framework Model of the Trinity Aquifer and Calculate Brackish Water Volumes	\$116,878.00	\$3,579.76	\$67,236.96	\$49,641.04
4	Delineate Potential Production Areas	\$40,001.00	\$0.00	\$2,259.39	\$37,741.61
5	Determine the Amount of Brackish Groundwater that can be Produced without Causing Impact on Lateral and Vertical Fresh Water	\$56,740.00	\$18,626.48	\$19,627.44	\$37,112.56
6	Stakeholder Communication	\$35,631.00	\$95.75	\$95.75	\$35,535.25
7	Reporting	\$13,555.00	\$0.00	\$9,585.00	\$3,970.00
Total		\$420,000.00	\$24,959.18	\$223,409.14	\$196,590.86