Texas AgriLife Research
Texas Water Resources Institute

Implementing the Pecos River Watershed Protection Plan through Continuous Water Quality Monitoring and Dissolved Oxygen Modeling
FY 09 CWA 319(h)
TSSWCB Project No. 09-08

Quarter no. ___3___ From ___4.1.2010___ Through _6.30.2010___.

I. Abstract

Work this quarter has continued to focus on getting the project up and running. The project QAPP has been submitted to TSSWCB and EPA for review and approval. Approval is expected early next quarter. TCEQ has conducted initial site reconnaissance for the CWQM station and has developed a working design for this site. TIAER conducted a watershed reconnaissance trip to gain firsthand knowledge of the river for use in model set up. Regarding the model, TIAER developed a summary document that describes potential models to utilize for DO evaluations and has submitted it to TSSWCB for review. TWRI has continued to work with TCEQ to procure needed instrumentation for the CWQM station. Instrumentation changes have resulted in delays in getting all needed items purchased. We anticipate that this portion of the project will be completed next quarter.

II. Overall Progress and Results by Task

TASK 1: Project Administration and Coordination

Subtask 1.1: *TWRI, in cooperation with TCEQ and TIAER, will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July and October. QPRs shall be distributed to all project partners and posted to the project website.*

The following actions have been completed during this reporting period:

A. TWRI submitted the Quarter 3, Year 1 report to TSSWCB on July 9, 2010.

24% Complete

Subtask 1.2: *TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.*

The following actions have been completed during this reporting period:

A. TWRI has completed account and sub-account set up.

B. To date, approximately $1,700 dollars have been spent, or less than 1% of total project funding.

5% Complete

Subtask 1.3: *TWRI will host coordination meetings, conference calls, or TTVN meetings with the TSSWCB Project Manager and all Project Partners at least quarterly to discuss project activities, project schedule, communication needs, deliverables, and other requirements.*

The following actions have been completed during this reporting period:

A. Several informal discussions on the development of the QAPP and model selection were held this quarter.

20% Complete

Subtask 1.4: *Project Partners will cooperate and communicate with landowners and entities that contributed to the development of the Pecos River WPP in order to efficiently and effectively achieve project goals and to summarize activities and achievements made throughout the course of this project. Specifically, Project Partners will, at least, participate in public meetings as necessary to obtain local input, deliver information on project activities, discuss goals and objectives and guide future project activities. Additionally, Project Partners will attend and participate in other public meetings in the Pecos River watershed, as needed, such as city council meetings, county commissioner's court meetings and SWCD meetings, in order to communicate project goals, activities and accomplishments to affected parties.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

TASK 2: Quality Assurance

Subtask 2.1: *TCEQ will bring the collection of data at the new CWQM site (Task 3) under their existing EPA-approved CWQM QAPP.*

The following actions have been completed during this reporting period:
A. Work has been initiated to bring the new CWQM site under the existing CWQM QAPP.

10% Complete

Subtask 2.2: *TWRI, with assistance from TIAER (Subtask 4.1) will develop a QAPP for activities in Task 4 consistent with the most recent versions of* EPA Requirements for Quality Assurance Project Plans (QA/R-5) *and the* TSSWCB Environmental Data Quality Management Plan.

The following actions have been completed during this reporting period:

A. A draft QAPP for the project has been completed and submitted to TSSWCB for review on June 16, 2010.

B. QAPP approval is expected next quarter

50% Complete

Subtask 2.3: *TWRI will submit revisions and necessary amendments to the QAPP as needed.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

TASK 3: CWQM Station Construction, Installation, Operation, Maintenance and Data Transfer

Subtask 3.1: *TWRI will purchase needed supplies to construct and maintain a deployable CWQM station. TWRI will transfer these supplies to TCEQ.*

The following actions have been completed during this reporting period:

A. TWRI has largely completed purchasing except for a few items that can be picked up locally and the water quality sondes.

B. TCEQ is in the process of re-instrumenting all Pecos CWQM stations and we will ensure that instrumentation purchased is consistent with TCEQ's newly chosen equipment.

C. TWRI will complete procurement when TCEQ settles on the new monitoring equipment.

60% Complete

Subtask 3.2: *TCEQ will design, construct, test and deploy a continuous water quality monitoring site at the selected location near Girvin, TX upstream of US 67. This site will continuously monitor DO, temperature, pH and specific conductance using the same type equipment that the other 5 stations in the watershed utilize.*

The following actions have been completed during this reporting period:

A. TCEQ has done site reconnaissance and developed a station design that is feasible for deployment at this site.

25% Complete

Subtask 3.3: *TCEQ will operate and maintain the CWQM station utilizing existing personnel and resources. This will entail monthly site visits by TCEQ Region 7 technical staff to ensure proper functioning of monitoring and reporting equipment. Additionally, TCEQ staff will validate recorded data and ensure that the data is made available through TCEQ webpages, including http://www.texaswaterdata.org.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

Subtask 3.4: *TCEQ will coordinate with USGS to continue operation and maintenance of discharge monitoring equipment at the USGS gage near Girvin (08446500) to ensure that pollutant load calculations can be developed utilizing the available data.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

Subtask 3.5: *TWRI will work to identify and secure long-term sources of funding to continue the operation and maintenance of both the CWQM site and USGS gage near Girvin. Through this project, funding for the CWQM site is covered through the end of FY2012. Currently, funding for the USGS gage is covered through the end of FY2010*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

TASK 4: Dissolved Oxygen Modeling and Management Practice Evaluation

Subtask 4.1: *TIAER will evaluate DO models, such as QUAL2K, capable of simulating low-flow steady-state conditions and diel DO fluctuations from aquatic vegetation photosynthesis and respiration. TIAER will recommend the use of suitable candidate model for the Pecos River. TIAER, TWRI and TSSWCB will select the model to be used. Once the most suitable model is selected, TIAER will assist TWRI in developing a modeling QAPP (Task 2).*

The following actions have been completed during this reporting period:

A. TIAER completed a document that describes the two likely model candidates for the project and presents the pros and cons of each.

B. Final model selection will not be completed until the project QAPP has been completed and the model calibration and validation process has been complete.

45% Complete

Subtask 4.2: *TIAER will obtain and evaluate relevant historical data on the Pecos River including, but not limited to, streamflow, water quality, water rights withdrawals, and wastewater treatment facility discharges. TIAER will access databases for pertinent data needed in the next subtask for model development and validation.*

The following actions have been completed during this reporting period:

A. TIAER has collected available data from TCEQ's SWQMIS database.

50% Complete

Subtask 4.3: *TIAER will develop and validate against historical data, a QUAL2K model (or similar model) of the Pecos River Segments 2310 and 2311, with specific emphasis on currently impaired assessment units 2311_05 and 2311_06. The model will represent DO conditions under low flow steady-state conditions and include critical pollutant sources (organic loadings, nutrients, total dissolved solids, etc.), attached and suspended algae, and hydrologic alterations (Red Bluff Reservoir, irrigation withdrawals, etc.), which are all potentially contributing to the current DO impairment in assessment units 2311_05 and 2311_06. TIAER will perform limited sensitivity testing of model input parameters by first increasing and then decreasing each*

parameter separately to determine its affect on model output.

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

Subtask 4.4: *TIAER will apply the validated model for a series of low-flow base conditions in the Pecos River that represents seasonal conditions in the river. TIAER will then impose on the various base conditions selected BMPs for which the model will predict changes in DO concentrations. These BMPs will include, but not necessarily be limited to, options that will decrease organic loadings to the river, decrease salinity content, decrease nutrient loading, increase flow, increase aeration, increase shading and decrease water temperature. Specific BMPs recommended by landowners and entities included in the Pecos River WPP will be included in this analysis.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

Subtask 4.5: *TIAER, with assistance from TWRI, will develop a Technical Report describing results from Task 4. This report will include descriptions and discussion of model inputs, assumptions and outputs; a detailed discussion of sources of pollution as identified by the model and their influence on DO levels in the river, an estimate of pollutant load reductions needed to achieve water quality restoration and expected load reductions from each BMP or suite of BMPs to address individual pollutant categories. A concluding discussion on alleviating the DO impairment in the Texas portion of the Pecos River will also be included and should recommend a implementation approach for BMPs that will ultimately result the restoration of DO levels. Results from this modeling evaluation will be combined into a Technical Report which will be distributed to landowners and entities involved in the development of the Pecos River WPP; based on their recommendations, conclusions from the DO modeling and evaluations of BMPs will incorporated into future revisions of the WPP and used to guide future BMP implementation.*

The following actions have been completed during this reporting period:

A. No activity to report at this time.

0% Complete

III. Related Issues/Current Problems and Favorable or Unusual Developments

-   Preliminary work has been done and will continue to be carried out in an effort to allow QAPP covered activities to begin upon the approval of the QAPP.
-   TCEQ's change of the brand and model of multiprobe used in the Pecos CWQM sites has delayed the purchase of needed materials for the new monitoring station.

IV. Projected Work for Next Quarter

-   Work will continue on the QAPP and comments from TSSWCB and EPA will be responded to; signature pages will be completed.
-   Work will continue to procure needed materials for CWQM site development.
-   Work will continue in coordinating the collection of needed data for model selection.