

**Texas AgriLife Research  
Texas Water Resources Institute**

**Watershed Protection Plan Development for Buck Creek  
FY 06 CWA 319(h)  
TSSWCB Project No. 06-11**

Quarter no. 13 From 1.1.2010 Through 3.31.2010

**I. Abstract**

Work conducted during this quarter of the project has focused on the continued collection of water and fecal samples to help bolster the data set in the Texas Known Source Library specific to the Panhandle region of the state. Water samples were collected at all sites this quarter. The draft WPP was sent to TSSWCB on 11.19.09 for their initial review; as of yet, no comment has been received. Data formatting was also completed on data collected up to September 30, 2009 and transferred to TSSWCB for later submission to TCEQ. Work has continued on the final report for BST results and a revised draft was received by TWRI on 3.30.10.

**II. Overall Progress and Results by Task**

**TASK 1: Project Coordination and Administration**

Subtask 1.1: *Conduct quarterly TTVN meetings as appropriate with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements. (Sept. 06 - Aug. 10).*

The following actions have been completed during this reporting period:

- a. No activity to report at this time.

**85% Complete**

Subtask 1.2: *TWRI will prepare electronic quarterly reports. All progress reports will also be provided to Texas AgriLife Research and Texas AgriLife Extension Service project cooperators and participants, Hall-Childress, Collingsworth, and Donley SWCD directors and will be placed on the project website. (Sept. 06 - Aug. 10).*

The following actions have been completed during this reporting period:

- a. Submitted Year 4, Quarter 1 report to TSSWCB on April 13, 2010.

**90% Complete**

Subtask 1.3: *Representatives from TWRI will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc. (Sept. 06 - Aug. 10).*

The following actions have been completed during this reporting period:

- a. TWRI and TSSWCB continue to confer and discuss the project, its workplan and

deliverables.

**90% Complete**

Subtask 1.4: *TWRI will submit appropriate Reimbursement Forms. (Sept. 06 - Aug. 10).*

The following actions have been completed during this reporting period:

- a. As of November 30, 2009, a total of \$346,390 or about 80% of total project funding has been expended.

**80% Complete**

Subtask 1.5: *TWRI will attend all stakeholder meetings as described in Task 6. (Sept. 06 - Aug. 10).*

The following actions have been completed during this reporting period:

- a. No activity to report at this time.

**85% Complete**

## **TASK 2: Quality Assurance Project Plan Development**

Subtask 2.1: *TWRI will develop a QAPP that will detail project goals and objectives relating to water quality monitoring activities; identify the data needed to fulfill those objectives; list field and laboratory methods; describe procedures and schedules to be followed; and specify a data management structure and the quality assurance protocols. (Sept. 06 – Feb. 07).*

The following actions have been completed during this reporting period:

- a. No activity to report at this time.

**100% Complete**

Subtask 2.2: *Provide annual revisions to the QAPP and amendments, as necessary, to the TSSWCB and EPA. (Feb. 07 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. No activity to report at this time.

**90% Complete**

## **TASK 3: Sanitary Survey of Buck Creek Watershed**

Subtask 3.1: *Texas AgriLife Research will acquire available literature, data, and information germane to describing the contributions, both spatially and temporally, and sources of bacterial loading in Buck Creek. The data analyses will include discussion of temporal (inter-annual, seasonal) and spatial trends in water quality, an evaluation of potential sources, and an identification of data gaps. This task will include an explanation of how BST methods provide useful data to assist in water quality management efforts where bacterial contamination is a concern. (Sept. 06 – Oct. 09).*

The following actions have been completed during this reporting period:

- a. Fecal material continues to be collected as a means to identify other sources contributing *E. coli* to the Buck Creek watershed.

**99% Complete**

*Subtask 3.2: Texas AgriLife Research will perform an aerial assessment of watershed will be utilized along the main channel of Buck Creek to identify and characterize stream channel locations, vegetation dynamics, current land use, and potential bacteria sources to the creek. The area will be flown twice during the project to assist in determining possible contributions. This information will be supplemented with a review of current DOQQ photography. Information from this subtask will be crucial in the development of implementation strategies in the Watershed Protection Plan. (Sept. 06 – Aug. 09).*

The following actions have been completed during this reporting period:

- a. This task has been completed.

**100% Complete**

*Subtask 3.3: Texas AgriLife Research will conduct an inventory of existing land use patterns in the Buck Creek watershed utilizing available imagery. (Sept. 06 – Aug. 07).*

The following actions have been completed during this reporting period:

- a. This subtask is complete.

**100% Complete**

*Subtask 3.4: Texas AgriLife Research will conduct a survey of the watershed to identify the potential sources of fecal matter to Buck Creek. Wildlife and domestic animal sources of observed scat can be identified. Concentrated waterfowl areas and bird rookeries or bat colonies may be identified. The utilization of waterways by wildlife, as well as dogs, cats, and other domestic animals will also be assessed. Human influences are also typically identified, including malfunctioning septic systems and sewer overflows. (Sept. 06 – Aug. 09).*

The following actions have been completed during this reporting period:

- a. This task is now complete.

**100% Complete**

**TASK 4: Micro-Watershed Monitoring and Sampling**

*Subtask 4.1: Texas AgriLife Research will perform routine sampling (grab sampling) at six locations (Sites 3, 5, 6, 10a, 10c, and 11) on Buck Creek. (Feb. 07 – Aug. 09).*

The following actions have been completed during this reporting period:

- a. Samples were collected at all sites during the quarter.

**98% Complete**

Subtask 4.2: *Texas AgriLife Research will collect a minimum of 8 rain event/high flow grab samples from the Buck Creek sites over the course of the study. (Feb. 07 – Aug. 09).*

The following actions have been completed during this reporting period:

- a. This task is complete.

**100% Complete**

Subtask 4.3: *Texas AgriLife Research will perform quarterly sampling (grab sampling) at selected tributary sites within the Buck Creek watershed when flow is present. (Feb. 07 – Aug. 09).*

The following actions have been completed during this reporting period:

- a. Samples collected at site 5 during January, February and March.

**98% Complete**

Subtask 4.4: *Texas AgriLife Research will compile and analyze the sampling data. Data will be for informational and assessment purposes due to the limited data previously collected. (Feb. 07 – Jan. 10).*

The following actions have been completed during this reporting period:

- a. This task is now complete.

**100% Complete**

Subtask 4.5: *TWRI will transfer monitoring data from activities in Task 4 to TSSWCB for inclusion in the TCEQ surface water quality monitoring database. (Aug. 09 – Aug. 10)*

The following actions have been completed during this reporting period:

- a. Data were formatted into the TCEQ required format and transferred to TSSWCB on February 10, 2010.
- b. This task is now complete.

**100% Complete**

## **TASK 5: Bacterial Source Tracking**

Subtask 5.1: *Stage 1 BST Assessment. Monthly targeted water grab sampling of creek segments at greatest risk for fecal pollution loading, as identified through the sanitary survey, will be performed for a period of six months (Texas AgriLife Research -Vernon). Approximately 50 E. coli isolates from 50 different water samples will be analyzed using ERIC-PCR and RiboPrinting and compared with known isolates from the previously developed Texas AgriLife Research-El Paso, Texas E. coli source library to determine the need for the development of a local Buck Creek source library for Stage 2 of the BST work (Texas AgriLife Research-El Paso). Bacteroidales PCR will be performed by Texas AgriLife Research-El Paso to determine if creek segments are being impacted by human or animal fecal pollution. Depending on the results of*

*the Stage 1 BST work, the number of water and source isolates and the types (sewage or animal) of source samples listed below for Stage 2 may change. (Feb. 07 – Aug. 07).*

The following actions have been completed during this reporting period:

- a. This subtask is now considered complete.

#### **100% Complete**

*Subtask 5.2: Samples of fecal matter and/or domestic sewage will be collected from the major potential sources of fecal matter in the watershed. These sources will include domestic animals, wildlife, and human sources. In all, 100 known source samples from the Buck Creek watershed will be collected and processed for E. coli isolation and archival by Texas AgriLife Research-Vernon. Bacterial cultures of E. coli isolates will be archived for future analyses and dissemination to other laboratories. E. coli isolates will be sent to the Texas AgriLife Research-El Paso laboratory for BST analyses and selection of isolates for inclusion in the source library. It is anticipated that over 300 E. coli colonies from source samples will be screened by ERIC-PCR. Approximately 100 of those isolates will be selected for ribotyping BST analysis and inclusion in the source identification library. All sample collection, processing procedures and documentation will be specified in the QAPP. (Aug. 07 – Jan. 10).*

The following actions have been completed during this reporting period:

- a. This task is now complete.

#### **100% Complete**

*Subtask 5.3: Ambient water sampling, analysis and isolation of E. coli will be conducted by Texas AgriLife Research – Vernon. Ambient water samples will be collected from at least 4 sites in the Buck Creek watershed on ten dates over a 1-year period. These dates would likely include at least five dry weather events and at least three post-rainfall events. Approximately five water samples would be collected on each date from each site; and ten samples from the vicinity of the Clean Rivers Program monitoring site. E. coli in water samples will be enumerated using USEPA Method 1603 by the Texas AgriLife Research-Vernon laboratory. Following enumeration, Texas AgriLife Research-Vernon will isolate E. coli from the samples and archive cultures. Bacterial cultures of E. coli isolates will be archived for future analyses and dissemination to other laboratories. E. coli isolates will be sent to the Texas AgriLife Research-El Paso laboratory for ERIC-PCR and RiboPrinting BST analyses and source identification. The Texas AgriLife Research-El Paso laboratory technician will coordinate sample shipment or collection (when necessary) with Texas AgriLife Research -Vernon. (Aug. 07 – Jan. 10).*

The following actions have been completed during this reporting period:

- a. This task is now complete.

#### **100% Complete**

*Subtask 5.4: ERIC-PCR and RiboPrinting fingerprints of approximately 500 E. coli isolates from ambient water samples will be analyzed and compared to source library isolates using Applied Maths BioNumerics software by Texas AgriLife Research-El Paso. (Aug. 07 – Jan. 10).*

The following actions have been completed during this reporting period:

- a. This task is now complete.

**100% Complete**

*Subtask 5.5: Texas AgriLife Research-El Paso will compile and analyze the BST data. Water isolates will be identified to cattle, other livestock, avian and non-avian wildlife, domestic sewage, and pet sources. Results will help identify the sources needed to be addressed by the Watershed Protection Plan. (Aug. 07 – Jan. 10).*

The following actions have been completed during this reporting period:

- a. A revised draft final report was received by TWRI on March 30 and will be review and finalized during the next quarter.

**85% Complete**

### **TASK 6: Stakeholder Coordination and Education**

*Subtask 6.1: The Vernon Research Assistant will receive training on watershed protection plan development and serve as the watershed coordinator for Buck Creek. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. The Research Assistant has completed the Watershed Protection Planning Workshop on June 2-6, 2008 in Bandera.

**100% Complete**

*Subtask 6.2: The Vernon Research Assistant/Watershed Coordinator, with assistance from TWRI and Texas AgriLife Extension Service, will assemble a stakeholder group to provide input and assist in the development of a Watershed Protection Plan. The stakeholder group will be made up of landowners, elected officials, agency representatives, industry groups, and others as appropriate. Potential agency representatives and industry groups include soil and water conservation districts, county commissioners and judges, Texas State Soil and Water Conservation Board, Red River Authority, Texas Commission on Environmental Quality, Texas AgriLife Extension Service, Texas AgriLife Research, Texas Water Resources Institute, Texas Parks and Wildlife Department, Natural Resources Conservation Service, Farm Services Agency, Texas Cattle Feeders Association, and Texas Farm Bureau. Participation by all that may be affected will be encouraged throughout the process. (Sept. 06 – Feb. 07).*

The following actions have been completed during this reporting period:

- a. The stakeholder group has been assembled and continues to be added to as the project progresses.

**98% Complete**

*Subtask 6.3: The stakeholder group will meet quarterly, or as needed. These meetings will be held within the Buck Creek watershed to solicit input on the development of the watershed plan. In addition, the status of monitoring and assessment efforts will be presented in the context of how a*

watershed plan will promote recovery or proper functions of the Buck Creek watershed. (Sept. 06 – Aug. 10).

The following actions have been completed during this reporting period:

- a. No activity to report this quarter as the next meeting is contingent upon the revision of TSSWCB comments to the first draft of the WPP.

**85% Complete**

*Subtask 6.4: As appropriate, educational programs will also be provided in conjunction with the stakeholder meetings. Informational programs on topics such as principles of watershed hydrology, primary nonpoint source pollution types, and agricultural BMPs for protecting water quality (i.e. alternative watering, riparian management issues, livestock and wildlife management, grazing management, shade development, feeding strategies, cross fencing, and prescribed burning) will also be provided. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. No new activity to report at this time.

**60% Complete**

*Subtask 6.5: The Vernon Research Assistant/Watershed Coordinator will also meet semi-annually with each SWCD to discuss the status of the project and obtain any input the SWCDs have to offer regarding the project and watershed protection plan. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. The Research Assistant/Watershed Coordinator met informally with the SWCDs.

**95% Complete**

*Subtask 6.6: TWRI will develop (Months 1-3), host and maintain (Months 3-36) an internet website for the dissemination of information on educational, monitoring and demonstration activities taking place across the Buck Creek watershed. Website delivery of information will be the most time and cost effective way to disseminate information to interested people or groups. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. The website has been developed and will be updated at least quarterly with project updates. Any and all information related to the project will be available on the project website. <http://twri.tamu.edu/buckcreek/>

**99% Complete**

## **TASK 7: Watershed Protection Plan**

*Subtask 7.1: Texas AgriLife Research and TWRI will develop a Watershed Protection Plan for Buck Creek based on criteria set forth in the FY04 guidelines. Findings from Tasks 3-5 and*

*stakeholder input obtained from Task 6 will be utilized to develop the plan. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. The first draft of the Buck Creek WPP was completed and was sent to TSSWCB on November 19<sup>th</sup> for their initial review.

**75% Complete**

*Subtask 7.2: TSSWCB, Texas AgriLife Extension, RRA, and local SWCDs will assist with composition, editing, and publication of the final watershed protection plan, as needed. (Sept. 06 – Aug. 10).*

The following actions have been completed during this reporting period:

- a. Initial feedback has been received from multiple parties on the content and composition of the Buck Creek WPP.

**20% Complete**

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

- AgriLife Vernon completed NELAC lab manual requirements and proficiency tests.

### **IV. Projected Work for Next Quarter**

The following will be accomplished during the coming quarter:

- a. Work on the draft WPP will continue upon the receipt of comments from TSSWCB.
- b. A stakeholder meeting will be held next quarter to go over the Buck Creek WPP with watershed stakeholders.
- c. Work will continue on the BST final report.
- d. Fecal sample collection will continue in an effort to bolster the Buck Creek specific fecal bacteria data set.