

**Improving Water Quality by Developing, Implementing and  
Field Testing Innovative Methods  
FY 03 CWA 319(h)  
TSSWCB Agreement No. 03-10**

Quarter no. 7 From 4/01/05 Through 6/30/05

**I. Abstract**

Technology implementation, optimization and sample collection were the main focus of the seventh quarter. Although both technologies faced difficulties in equipment availability, weather interferences and system operation, both eventually established their systems on dairies and have been sampled. Additionally, an RFP was released for year two technology selection on 5-27-05. The technology advisory committee will meet on 7-28-05 to select the two new technologies to demonstrate for year 2.

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

**TASK 1: Demonstration and Evaluation of New Technologies**

*Subtask 1.1: Identification of potential technology providers. TCE, TWRI, TFB, dairy industry representatives, EPA Region 6, TSSWCB, TCEQ, BRA, NRCS, and TAES will identify and select promising technologies represented by willing technology providers. (month 1 thru 3)*

The following actions have been completed during this reporting period:

- a. The two technologies currently being evaluated for year one include:
  - 1) “Electrocoagulation Technology” proposed by Ecoloclean Industries, Inc. (Huntsville, TX)
  - 2) “Phosphorus Removal by Chemical Precipitation and Geotube<sup>®</sup> Dewatering” proposed by Miratech Division (Commerce, GA)
- b. An RFP to select year two technologies was released on 5-27 with a deadline of 6-30. The Technology Advisory Committee will meet on 7-28-05, in Waco to discuss the three proposals received and select the two technologies to evaluate for this year.

**50% Complete**

*Subtask 1.2: Identification of dairy cooperators in the North Bosque watershed area that use a flush system and lagoons to remove, store, treat, and land-apply effluent (manure and process-generated wastewater). TCE, TSSWCB and TFB will identify dairy operations willing to participate in these demonstrations. (month 1 thru 3)*

The following actions have been completed during this reporting period:

- a. The two technologies are being implemented at the following dairies:
  - 1) “Ecoloclean” – OSVE Dairy (proprietor – Mr. Bert Velson), Bosque Watershed.
  - 2) “Geotube” – Triple X Dairy (proprietor – Mr. Wayne Moermen), Leon Watershed.
- b. Proposals received for year two demonstrations have dairy cooperators already identified to have demonstrations evaluated on their farms.

**50% Complete**

*Subtask 1.3: On-site installation and start-up of the six pilot-scale technologies to be demonstrated. Technology providers will carry out the task of equipment transport, on-site installation, set-up, and start-up. With permission from the cooperating dairy owner/operator, the technology provider will prepare the site to install and operate the system for demonstration. (First installation by August 2003, last installation 6 months before the end of the 3-year project)*

The following actions have been completed during this reporting period:

- a. Year two technologies will be identified on 7-28-05, and will be installed in the next quarter.

### **30% Complete**

*Subtask 1.4: QAPP preparation and field data collection and analysis.*

*TCE will prepare the DQO and QAPP (August 2003 to August 2004)*

### **100% Complete**

*TCE will collect samples from raw and treated effluent and resulting sludge. One of the evaluation tasks will be to analyze the sludge or by-product remaining after raw material treatment for P stability (August 2003 to May 2006)*

The following actions have been completed during this reporting period:

- a. Project personnel conducted a third sampling trip on 4-5-05 and collected samples from the “Geotube” Technology and submitted the samples to TIAER for analysis (**Figure 1 and 2**). Preliminary data shows promising decreases in P levels.
- b. After numerous problems in reaching optimum system operation the “Ecoloclean” technology began sampling on 4-6-05. Samples were also collected on 4-13-05, 6-8-05 and 6-27-05. Collection of samples will continue into the next quarter, with collection dates set for 7-7-05 and 7-12-05. Samples were submitted to TIAER for analysis.
- c. TIAER had some problems with QC (LCS/LCSD) on sodium and calcium of samples collected on 4-5-05 and 4-13-05. The LCS (laboratory control standard) was too low based on the high concentration levels of these constituents in samples (15- 500 times higher than the LCS). A Corrective Action Report on Ca & Na values was prepared (See attached **Appendix A**). TIAER provided good estimates for the samples as noted. The lab ordered a higher LCS for the next shipment of samples to hopefully avoid this problem in the future.
- d. TWRI received confirmation from EPA that the amendment to the project QAPP changing the reporting limits for solid samples was approved.
- e. TWRI submitted and amendment to the QAPP to allow for the analysis of Aluminum in samples.

### **30% Complete**

*Subtask 1.5: Develop reports and outreach education materials. TCE in cooperation with TWRI will produce educational brochures and publications on effectiveness of this innovative technology. Quarterly and final reports will be prepared and submitted in a timely manner.*

The following actions have been completed during this reporting period:

- a. A Dairy Technology Tour on the Triple X Dairy was held on 4-26-05 where preliminary results of the Geotube Solid-liquid separation technology were presented. Two partially dewatered Geotubes were introduced to the tour participants. Verbal descriptions along with some photographs of the various components of the technology (alum and polymer pumps, Doppler flow meter etc.) were described by Dr. Mukhtar. Participants showed keen interest in learning more about the technology.
- b. Clint Wolfe made a presentation on project progress and effectiveness of demonstrated technologies at the Cross-Timbers Soil and Water Conservation District Dairy Program held May 9, 2005 in Stephenville.
- c. TWRI submitted an amendment to the plan of work to include the option of evaluating additional technologies. The amendment was approved.
- d. TWRI worked with the Brazos River Authority to update information relating the project on the agency's Web site which lists ongoing projects in the Bosque River Watershed.
- e. Submitted Year 2, quarter 3 report to TSSWCB on 7-15-05.

**65% Complete**

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

Although technology implementation and evaluation has been a challenge for this project, it has been beneficial for both the providers and the dairy producers. First, many of these technologies have little field experience and only have operated in a laboratory setting. However, this project provides these technologies an opportunity to attempt operation in the field. Second, implementation on-site exposes technology providers to common dairy operations, characteristics of waste material and the potential setbacks due to environmental conditions. Third and perhaps one of the most beneficial impacts, dairy producers have the opportunity to learn about these technologies as a third party. Time, equipment and money are all saved as this project assists in identifying many of these technology's 'glitches' that need to be repaired by the technology provider and optimize it before a system becomes fully operational.

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

The following will be accomplished during the coming quarter:

- a. "Ecoloclean" technology will continue to be sampled during the next quarter.
- b. A demonstration of Ecoloclean technology is tentatively set for august 2005.
- c. Year two technologies will be selected by the Technology Advisory Committee.
- d. Year two technologies will be installed on cooperating dairies.



**Figure 1.** Partially filled Geotubes



**Figure 2.** Collection of samples from Geotube Technology.

**Appendix A**