

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

Quarter no. 13 From 10/01/06 Through 12/31/06

I. Abstract

A letter from Envirotech, Inc. was received notifying us of their withdraw from the MOA and the project. Envirolink continued sampling at the Sherywn Wood dairy near Stephenville and has now completed 6 sampling events. Two new technologies were chosen for demonstration in third year of demonstrations. Natural Biotechnology will use a proprietary mix of *Lactobacillus* bacteria to treat the lagoon. Wild West Dairies near Stephenville, and in the Bosque River watershed has agreed to cooperate with this technology provider. An initial site visit was conducted December 18th to discuss sampling and the sampling protocol. The sampling protocol is in the works and will be finalized in early January. A second technology proposed by Ozona Environmental, LLC will use oxygenation and microbial stimulation to treat a lagoon at a dairy that has yet to be determined. Due to rising sample analysis costs, demonstration of a 6th technology will not be possible due to budget constraints. In place of the 6th technology, a laboratory demonstration using residual material from a Geotube[®] as a soil amendment used under turfgrass growth to show differences in leaching losses and turf growth. Extension publication has been developed and is currently at the printer. This document will be available to the public sometime in January.

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. Year one projects have been completed. Fact sheets and reports have been completed are currently posted on the TWRI website for everyone to access at:
<http://twri.tamu.edu/project-info/NewTechnologies/>
- b. Year two technologies have been initiated:
 - 1) “Demonstrate and Evaluate the Use of Technologies to Reduce Animal Waste Pollution” proposed by EnviroLink (Greeley, KS) has been implemented. This technology is up and running with six sampling events already completed. Approximately 3 more sampling events will occur on a bi-monthly basis.
 - 2) The second technology was planned to be “A Demonstration by Envirotech, Inc. of Phosphorus Removal From Liquid Manure Effluent at a Texas Dairy Farm by the

Use of Bauxsol™, proposed by Envirotech, Inc. (Atlanta, GA). After initial tests, the technology provider determined that implementation was financially unfeasible and terminated their agreement to demonstrate their technology.

- c. Year three technologies have been selected:
- 1) A demonstration by Natural Biotechnology entitled “Demonstrate and Evaluate the Use of Technologies in Reducing Animal Waste Pollution” was chosen as the first year 3 demo. A preliminary site visit was conducted December 18, 2006 at Wild West Dairy near Stephenville to discuss sampling protocol and locations. The technology should be implemented in February.
 - 2) Two proposals were submitted in response to the re-released RFP for year 3 technologies. A proposal to demonstrate a “Wastewater Treatment Solution” that uses oxygenation and microbial stimulation to treat the lagoon. This technology will be demonstrated by Ozona Environmental, LLC.
- d. Supplemental Demonstration:
- As a result in rising sample analysis costs and the lack of submitted proposals, the project workplan was amended to allow for the demonstration of planting turfgrass on soils supplemented with residual material from a Geotube®. This demonstration will be conducted in a laboratory setting at Texas A&M and will cost less than the demonstration of a sixth technology. This demonstration will evaluate the changes in physical and chemical changes between soil and soil with added Geotube® residual material, evaluate turfgrass responses when grown on soil and soil with added Geotube® material, and evaluate leaching losses of nutrients and dissolved organic carbon under the varying scenarios. Sampling funds not used for this demonstration will be used to cover the increased sampling costs for the remaining technology demonstrations.

100% 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 year one technologies were 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. The year two technologies have chosen the following dairies to apply their technology:
 - 1) “EnviroLink” - Sherwyn Wood Dairy (proprietor – Sherwyn Wood) Bosque watershed.
- c. Year three technologies are in the process of choosing dairies.
 - 1) “Natural Biotechnology” – Wild West Dairies (proprietor – Geoff Vandenieuwegiessen) Bosque River watershed.

- 2) "Ozona Environmental" is in the process of finding a dairy to collaborate with.

83% 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. Natural Biotechnology participated in a site visit with TAES, TCE, TSSWCB, and TWRI personnel to discuss sampling procedures and protocol. After a sampling protocol has been established, the project will be implemented.
- b. Ozona Environmental, LLC will participate in a preliminary meeting in late January and will discuss their demonstration in further detail. Estimated installation for their demonstration will be in the summer of 2007.

65% Complete

Subtask 1.4: QAPP preparation and field data collection and analysis. TCE will prepare the DQO and QAPP (August 2003 to August 2004)

- a. Annual revisions to the QAPP have been completed and have been approved.

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 2007)

The following actions have been completed during this reporting period:

- a. Sampling is underway for the EnviroLink technology. Six sampling events have been completed to date. Sampling that occurred in this quarter was conducted on October 11, and December 13.
- b. Sampling for Natural Biotechnology and Ozona Environmental, LLC will begin after the technologies have been implemented.

50% 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. An Extension publication combining the fact sheets for the Ecoloclean electrocoagulation technology and the Geotube technology has been developed and sent to the publisher. This document should be available by the end of January.
- b. TWRI submitted the year 4, quarter 1 report to TSSWCB on January 12, 2007.

71% Complete

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

- a. A site visit was conducted with Mark Yeager, the president of Natural Biotechnology at Wild West Dairies to discuss sampling and sampling approaches.
- b. Dr. Mukhtar made a presentation on year 1 technologies in Sulphur Springs on October 31.

IV. Projected Work for Next Quarter

The following will be accomplished during the coming quarter:

- a. A meeting with Ozona Environmental, LLC has been tentatively scheduled for late January to discuss the project and each parties responsibilities.
- b. A sampling protocol will be finalized for Natural Biotechnology's demonstration.
- c. The demonstration by Natural Biotechnology will be implemented at Wild West Dairies in February.
- d. A memorandum of agreement will be signed between TCE and Ozona Environmental, LLC.
- e. Sampling will continue at the Sherywn Wood dairy for the EnviroLink demonstration.
- f. The turfgrass demonstration will be initiated during this quarter as well.