

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

Quarter no. 11 From 4/01/06 Through 6/30/06

I. Abstract

The main goal of work during the eleventh quarter was to finalize year 1 technology reports and to develop fact sheets for both technologies. Final reports are currently under review from by the New Technologies Advisory Committee. Final reports will be sent to the TSSWCB by July 31, 2006. Year 2 technologies were also implemented in this quarter; although problems have surfaced with one technology provider and have delayed its implementation. A request for proposals has been sent out for year 3 technologies this quarter and will be due next quarter. Work scheduled for the next quarter will include sending in the final year 1 reports, resolving the problems experienced with Envirotech, accepting year 3 proposals, and scheduling an Advisory Committee meeting to discuss year 3 technologies and give updates on year 1 and 2 projects.

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 and reports are currently being finalized.
- b. Year two technologies have been initiated:
 - 1) "A Demonstration by Envirotech, Inc. of Phosphorus Removal From Liquid Manure Effluent at a Texas Dairy Farm by the Use of BauxsolTM" proposed by Envirotech, Inc. (Atlanta, GA) has not been implemented to date. Desired treatment size issues with the technology provider have surfaced and are currently being discussed; this has delayed implementation.
 - 2) "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 two sampling events already completed.
- c. The request for proposals (RFP) for year three technologies was released during this quarter and an advertisement has been sent to the Texas Dairy Review and will run in the July issue. To date, we have received one response to the year three RFP and several other inquiries.

- d. Dr. Saqib Mukhtar and Kevin Wagner attended the Farm Pilot Project Coordination's Technology Summit on May 10-12, 2006 and distributed year 3 RFPs to all technology providers at the conference.

72% 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.
 - 2) "Envirotech" – John Koster Dairy (proprietor – John Koster) Leon watershed.
- c. Dairies for testing year 3 technologies will be chosen after the technologies have been selected.

66% 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. EnviroLink has established its sampling protocol (attached at end of report).
- b. EnviroLink has also initiated its technology and has already completed two sampling events. Their technology is being tested at the Sherwyn Wood Dairy in the Bosque River watershed.
- c. On-site dairy set up has not been initiated by Envirotech.

50% 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 initiated and sent to TIEAR for their approval.
- b. Revisions will be sent to the TSSWCB by July 31, 2006.

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. Sampling has begun on the EnviroLink technology. Two sampling events have been completed (May 22 and June 27, 2006), a third trip is scheduled for July 26th.
- b. Envirotech has not implemented their technology yet; sampling will ensue after the project is implemented.

38% 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. Reports summarizing both the Ecoloclean electrocoagulation technology and the Geotube technology are being reviewed by the New Technologies Advisory Committee before submission to the TSSWCB on or before July 31, 2006.
- b. Fact sheets for the Ecoloclean electrocoagulation technology and the Geotube technology are being developed and will be sent out for revisions during the next quarter.
- c. The annual update to the QAPP has been initiated and sent to TIEAR for review. This will be submitted to the TSSWCB during the next quarter.
- d. TWRI submitted the year 3, quarter 3 report to TSSWCB on July 12, 2006.

68% Complete

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

- Envirotech, Inc., one of the year two technology providers, has expressed their desire to significantly deviate from their initial demonstration proposal and only do a small scale demonstration (two 250 gal. tanks) of the use of Bauxsol to treat dairy lagoon effluent. Their justification for this deviation is that it would be too costly for them to treat an entire lagoon as part of this demonstration. They estimate that it would require at least 10 tons of Bauxsol to treat a small lagoon and would prefer a scaled down demonstration that would use less chemical.

The problem with this is that the RFP calls for the following size requirements to be met by the tech provider to:

- a) maintain treatment at a continuous flow for the duration of the project
 - b) treat a quantity of lagoon / waste structure effluent comparable to the quantity used for normal irrigation rates on the dairy
- The year 3 RFP has been released and will also appear in the next issue of the Texas Dairy Review. Thus far, one proposal has been received.

- Lucas Gregory was hired as a new project manager for TWRI and will be taking over the project from Kevin Wagner.

IV. Projected Work for Next Quarter

The following will be accomplished during the coming quarter:

- a. Send the final reports to the TSSWCB and finalize fact sheets summarizing the results of the evaluation of the Geotube and Ecoloclean technologies.
- b. Continue negotiating with Envirotech and hopefully come to a final agreement with them and install their technology at the John Koster Dairy, 5 miles north of Comanche in the Leon River watershed.
- c. All proposals for year 3 technologies will be received by July 31, 2006; at that time, the selection process will begin.
- d. A New Technologies Advisory Committee meeting will be scheduled to provide updates on year 1 and 2 technologies and to discuss proposals for year.

Appendix I:
EnviroLink Sampling Protocol

Envirolink
Protocol

The primary goal of the underlying study is to document improvements in the water quality applied to the field when irrigating from dairy lagoons. A secondary goal is to document reductions in sludge. Toward that end, Envirolink proposes to test the efficacy of its bacteria in two arenas: 1) reductions in sludge and improvement in water quality in two artificial tanks, plus 2) similar measurements and treatment in a lagoon. Two tanks are proposed in order to replicate measurements and increase statistical accuracy.

		May	June	July	aug	sept	oct	nov	dec	jan	feb	mar	apr	may	
		1	2	3	4	5	6	7	8	9	10	11	12		
Water Testing		0	mo	mo	mo	mo	mo	mo	mo	mo	mo	mo	mo	mo	total
tanks 1&2	supernate	2	2	2	2	2	2	2	2	2	2	2	2	2	26
tanks 1&2	tot profile	2	2	2	2	2	2	2	2	2	2	2	2	2	26
lagoon	supernate	2	2	2	2	2		2		2		2		2	18
lagoon	tot profile	2	2	2	2	2		2		2		2		2	18
field irrig	Flow meter collection	4		4		4		4		4		4		4	28
	total	12	8	12	8	12	4	12	4	12	4	12	4	12	116

Sludge Depth Testing

tanks 1&2	15 spots per tank	2	2	2	2	2	2	2	2	2	2	2			22
lagoon	9 spots in lagoon	1		1		1		1		1		1		1	7
		3	2	0	2	3	2	3	2	3	2	3	0	1	26

Gray shading indicates these are baseline measurements. Pattern above indicates 90 day cycles for which the tanks will be cleaned out and refilled for the duration of the project. Test sludge effects in tanks for the same periods. Measuring solids in lagoons every 60 days.

Start date: May 22, 2006
End date : June 18, 2007 or before

Treatment regime for each setup Treatment for lagoons and tanks every 30 days
Provide tarp over tanks, anchored to lessen evaporation and whippage by wind.

Other Pertinent Information.

1. Mr. Wood agrees to maintain a minimum level in the lagoon, employing surplus water from his cooling water. He currently flushes after scraping plus provides flush water from his milking parlor.
2. Mr. Wood will allow an Envirolink employee or representative to collect a before treatment irrigation gun sample plus 1-2 post treatment samples collected just before the inline flow meter. These collection periods will coincide with Mr. Wood's irrigation needs. If possible, irrigation will occur as closely as possible time wise so that supernate water quality measurements can be correlated with similar variables in the applied irrigation water.
3. Mr. Wood will also provide a daily log of flushing activities as well as rainfall data.
4. Envirolink will pay for testing of e-coli levels in TWRI collected samples.
5. Envirolink will provide an Airolator for the lagoon.