

**Texas AgriLife Research  
Texas Water Resources Institute**

**Evaluation of Electrostatic Particle Ionization and BioCurtain Technologies to Reduce Dust, Odor  
and other Pollutants from Broiler Houses  
FY 2010 – Poultry Program  
TSSWCB Project No. 10-90**

Quarter no. 3 From 9/1/2010 Through 11/31/2010.

**I. Abstract**

Activity for this quarter included the first sampling trip to record data under warm conditions. BAEN, SFA, and WTAMU traveled to the Sanderson Farms facility in Mexia, TX to conduct analyses on how the installed EPI and BioCurtain™ technologies affected airborne constituents both within and outside the control and treatment poultry facilities. Participants also collected litter samples for analysis and BAEN processed data from the fan characterization tests to produce prediction equations for each fan. Significant time was also invested in planning for the upcoming sampling trip scheduled for the beginning of the next quarter to collect data under cooler conditions. Towards the middle of the quarter, new information pertaining to the timetable for the budget expenditures became apparent, and TWRI set up a meeting between fiscal and management personnel from both BAEN and TWRI to discuss the situation and come up with solutions for the issue. Work on the interim report covering costs and management associated with installation of the two technologies was compiled by BAEN, which will be ready for submission in the 4<sup>th</sup> quarter.

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

**TASK 1: Project Administration**

Subtask 1.1: *TWRI 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 15<sup>th</sup> of March, June, September, and December. QPRs shall be distributed to all project partners.*

The following actions have been completed during this reporting period:

A. TWRI submitted the third QPR for this project on December 15, 2010.

**38% 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 received invoices totaling \$77,654.06 during the quarter. This also includes invoices received but not yet documented in the last quarter on 8/20 and 8/31.
- B. As of November 15, 2010, a total of \$77,847.97, or 46% of total project funds have been expended.

**46% Complete**

Subtask 1.3: *TWRI will participate in meetings as appropriate in order to efficiently and effectively achieve project goals, coordinate monitoring efforts and summarize activities and achievements made throughout the course of this project.*

The following actions have been completed during this reporting period:

- A. TWRI hosted a project update meeting in early October to discuss concerns with the budget.

**38% Complete**

Subtask 1.4: *TWRI will develop, host and maintain a project website that will be used as a means to disseminate educational materials, project updates and notify readers about educational opportunities.*

The following actions have been completed during this reporting period:

- a. The Poultry Odors BMPs website is currently active. It can be found at <http://poultrybmps.tamu.edu/>. Since the website went online, it has been viewed by a grand total of 24 unique visitors.
- b. This quarter, the website was viewed by:
  - 4 unique visitors in September 2010
  - 4 unique visitors in October 2010
  - 4 unique visitors in November 2010
- c. TWRI has continued to add content to the website, including photos from recent survey and sampling trips.

**75% Complete**

Subtask 1.5: *TWRI will work with project personnel from BAEN and SFA to support the preparation of technical reports as required by project Tasks into published technical reports. These reports will be housed in the TWRI online Reports Database indefinitely.*

The following actions have been completed during this reporting period:

- A. Cost estimates for dust and odor mitigation at the poultry broiler facility.

BAEN prepared fixed and variable costs of operating the automated electrostatic particle ionization system and the BioCurtain<sup>TM</sup> system to be submitted to TSSWCB during the 4<sup>th</sup> quarter.

**5% Complete**

## **TASK 2: Quality Assurance**

Subtask 2.1: *TWRI, with assistance from BAEN and SFA, will develop a QAPP for activities in Tasks 3 and 4 consistent with EPA Requirements for Quality Assurance Project Plans (QA/R-5) and the TSSWCB Environmental Data Quality Management Plan.*

*All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in method specific, peer reviewed or widely accepted documents or SOPs describing the specific methods used. These documents will be detailed in the project QAPP when developed.*

The following actions have been completed during this reporting period:

- A. This task is complete.

**100% Complete**

Subtask 2.2: *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 this period.

**0% Complete**

## **TASK 3: Poultry Farm Selection and Equipment Installation**

Subtask 3.1: *BAEN and SFA will coordinate with TSSWCB to identify and select a poultry operation as a cooperator.*

The following actions have been completed during this reporting period:

- a. This task is complete.

**100% Complete**

Subtask 3.2: *BAEN and SFA will instrument the control and treatment houses with monitoring equipment. This includes air samplers; temperature, humidity, static pressures sensors; and a Fan Assessment Numeration System. Associated data loggers will also be installed.*

The following actions have been completed during this reporting period:

- A. BAEN and SFA successfully all necessary monitoring equipment within the control and treatment houses.

**100% Complete**

Subtask 3.3: *BAEN and SFA will coordinate with the manufacturer/distributor of the EPI and BioCurtain systems to install both treatment systems in the treatment barn.*

The following actions have been completed during this reporting period:

- A. This task is complete.

**100% Complete**

Subtask 3.4: *BAEN will track the costs associated with the procurement of the EPI and BioCurtain systems, the delivery, installation as well as any retrofitting that is needed to make the systems operational. This information will be compiled into a brief, yet all inclusive summary of costs that a producer could expect if this dust and odor mitigation system was purchased and installed.*

The following actions have been completed during this reporting period:

- A. BAEN prepared fixed and variable costs of operating the automated electrostatic particle ionization system and the BioCurtain™ system to be submitted to TSSWCB during the 4<sup>th</sup> quarter.

**90% Complete**

**TASK 4: BMP and Monitoring Systems Verification**

Subtask 4.1: *BAEN and SFA will test the BioCurtain and EPI systems independently to ensure the proper operation of each system. Testing will occur during two independent one-day trials for each system; one in the summer and one in the winter.*

The following actions have been completed during this reporting period:

- A. Summer testing occurred on September 23, 2010. Concentrations of ammonia, select volatile organic compounds hydrogen sulfide, and particulate matter upstream and downstream of the exhaust fans of both the control and treatment buildings were measured continuously for one day.

**50% Complete**

Subtask 4.2: *BAEN and SFA will operate and evaluate the EPI and BioCurtain system concurrently to ensure the proper operation of this dual-technology system. Testing of this technology will occur over a three-day period and will be repeated once during the summer and once during the winter.*

The following actions have been completed during this reporting period:

- A. Summer testing occurred on September 24, 2010. Concentrations of ammonia, select volatile organic compounds, hydrogen sulfide, and particulate matter upstream and downstream of the exhaust fans of both the control and treatment buildings were measured continuously for one day. Additionally, litter samples were collected from both houses for nitrogen and other constituents analyses.
- B. BAEN processed and analyzed data from fan characterization tests resulting in individual prediction equations for each fan (fan capacity in cubic yards per hour versus static pressure) in houses 1 and 2.

**50% Complete**

Subtask 4.3: *BAEN and SFA will operate and maintain monitoring equipment in the control barn during all BMP tests to verify that adequate comparisons will be able to be made between treated and un-treated air during a long-term demonstration.*

The following actions have been completed during this reporting period:

- A. BAEN and SFA have invested significant time in setup and installation of monitoring needs for the summer sampling trip conducted on September 23-24, 2010.
- B. BAEN and SFA are currently preparing the sampling setups for the upcoming winter sampling.
- C. BAEN constructed, calibrated and tested two data logger and sensor units for measuring and recording static pressure levels in test and control houses during fall test.
- D. BAEN repaired, re-calibrated, and re-tested two data logger and sensor units for measuring and recording static pressure levels in test and control houses during winter test.

**67% Complete**

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

TWRI will continue to resolve any issues with subcontractors and grant issuers concerning the budget timetable that developed during this quarter.

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

#### **Winter Sampling Trip**

BAEN, SFA, and WTAMU will be jointly conducting a sampling trip on December 7-8 to test the effectiveness of the dual-technology system as it relates to improvements in various air quality constituents.

#### **Interim Report**

BAEN, with assistance from SFA and WTAMU, prepared a report outlining the costs and foreseeable maintenance needs for the installed technologies. This will be submitted to TSSWCB for review in the next quarter.

#### **Other Projected Work**

- Submit the fourth quarterly progress report
- Participate in project coordination and update meetings