I. Abstract

Work this quarter has focused on the collection of base flow and storm water samples. Malfunctions with storm water sampling equipment were taken place but samples continue to be collected. Project personnel briefly met to discuss the timeline of the program. Work next quarter will consist of measuring the growth and survival of *E. coli* under different environmental conditions as well as the continuation of base and storm water sampling.

II. Overall Progress and Results by Task

**TASK 1: Project Coordination and Administration**

*Subtask 1.1:* TWRI will prepare electronic quarterly reports for submission to the TSSWCB. All progress reports will be provided to all Project Participants. (Month 1 - 36).

The following actions have been completed during this reporting period:
  a. The year 3, quarter 1 report was completed and sent to the TSSWCB on January 15, 2010.

  **74% Complete**

*Subtask 1.2:* TWRI will coordinate quarterly meetings (in person or TTVN) as appropriate with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements. (Month 1 – 36).

The following actions have been completed during this reporting period:
  a. The TWRI project manager briefly discussed the timeline with project leads.

  **74% Complete**

*Subtask 1.3:* TWRI will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc. (Month 1 – 36).

The following actions have been completed during this reporting period:
b. The TWRI project manager and the TSSWCB project manager have communicated about the project status via telephone conversations.

74% Complete

*Subtask 1.4: TWRI will submit appropriate Reimbursement Forms. (Month 1 – 36).*

The following actions have been completed during this reporting period:

a. As of December 31, 2009 a total of $181,414.56 or 60% of total project funding has been expended.

60% Complete

*Subtask 1.5: TWRI will develop (Months 1-3), host and maintain (Months 3-36) an internet website for the dissemination of information. (Month 1 – 36).*

The following actions have been completed during this reporting period:

a. The project website has been completed and is now available online. The web address for this site is: [http://bft.tamu.edu](http://bft.tamu.edu).

b. The project will be updated at least quarterly throughout the course of this project.

98% Complete

*Subtask 1.6: TWRI and Texas AgriLife Extension will work together to develop the Final report. (Month 30 – 36).*

The following actions have been completed during this reporting period:

a. No activity to report at this time.

0% Complete

*Subtask 1.7: TWRI and Extension will work together to develop publications, brochures and reports that will be disseminated for educational purposes. (Month 1 – 36).*

The following actions have been completed during this reporting period:

a. No activity to report at this time.

0% Complete

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Task 2: Development of Quality Assurance Project Plan

*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. (Month 1 – 6).

The following actions have been completed during this reporting period:

a. This task is complete.

100% Complete

Subtask 2.2: Provide annual revisions to the QAPP and amendments, as necessary, to the TSSWCB and EPA. (Month 6 – 36).

The following actions have been completed during this reporting period:

a. No activity to report at this time.

50% Complete

Task 3: Conducting sanitary surveys to identify potential E. coli contributing sources in the impaired watershed

Subtask 3.1: Choose a suitable watershed from the provided list of bacteria impaired stream segments. (Month 1 – 2).

The following actions have been completed during this reporting period:

a. This task is complete.

100% Complete

Subtask 3.2: Travel to the selected watershed and conduct a renaissance survey of the watershed and sources. (Month 6 – 8).

The following actions have been completed during this reporting period:

a. This task is complete.

100% Complete

Subtask 3.3: Conduct a thorough sanitary survey to identify various wildlife sources that contribute E. coli loads during winter. This survey will be conducted by a wildlife expert. (Month 6 – 8).

The following actions have been completed during this reporting period:

a. This task is complete.

100% Complete
Subtask 3.4: Conduct a thorough sanitary survey to identify various domestic livestock and poultry sources and waste streams that contribute E. coli loads during winter. This survey will be conducted by an extension county agent and/or an animal-production agriculture expert. (Month 6 – 8).

The following actions have been completed during this reporting period:
   a. GPS data points on poultry operations have been acquired and will be incorporated into the model. All location information will remain private.

45% Complete

Subtask 3.5: Verify and update wildlife survey with inputs from stakeholders and Texas Parks and Wildlife personnel and domestic animal survey with inputs from stakeholders, ranchers, and extension county agents. (Month 6 – 8).

The following actions have been completed during this reporting period:
   a. Multimodal density analyses for white-tailed deer, feral hogs, raccoons, skunks, and opossums was conducted.

35% Complete

Subtask 3.6: Conduct a thorough sanitary survey to identify various wildlife sources that contribute E. coli loads during summer. This survey will be conducted by a wildlife expert. (Month 8 – 12).

The following actions have been completed during this reporting period:
   a. No activity to report at this time.

80% Complete

Subtask 3.7: Conduct a thorough sanitary survey to identify various domestic livestock and poultry sources and waste streams that contribute E. coli loads during summer. This survey will be conducted by an extension county agent and/or an animal-production agriculture expert. (Month 8 – 12).

The following actions have been completed during this reporting period:
   a. GPS data points on poultry operations have been acquired and will be incorporated into the model. All location information will remain private.

35% Complete

Subtask 3.8: Verify and update wildlife survey with inputs from stakeholders and Texas Parks and Wildlife personnel and domestic animal survey with inputs from stakeholders, ranchers, and county Extension agents. (Month 12 – 14).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.
15% Complete

Task 4: Conducting demonstration experiments to characterize and quantify E. coli loads from identified sources

Subtask 4.1: Collect feces samples of relevant and dominant identified sources (five maximum) and samples of waste streams (five maximum) identified in Task 4 during winter. (Month 6 – 8).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.

86% Complete

Subtask 4.2: Extract feces samples and waste streams for E. coli collected during winter. (Month 6 – 8).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.

0% Complete

Subtask 4.3: Analyze samples collected during winter for E. coli using EPA’s approved enumeration technique. (Month 6 – 8).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.

0% Complete

Subtask 4.4: Calculate the E. coli load resulting from all identified sources collected during winter. (Month 8 – 10).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.

0% Complete

Subtask 4.5: Collect feces samples of relevant and dominant identified sources (five maximum) and samples of waste streams (five maximum) identified in Task 3 during summer. (Month 10 – 12).

The following actions have been completed during this reporting period:
   a. No activity to report this quarter.

60% Complete

Subtask 4.6: Extract feces samples and waste streams for E. coli collected during summer. (Month 10 – 12).
The following actions have been completed during this reporting period:
a. No activity to report this quarter.

55% Complete

*Subtask 4.7: Analyze samples collected during summer for E. coli using EPA’s approved enumeration technique. (Month 10 – 12).*

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

20% Complete

*Subtask 4.8: Calculate the E. coli load resulting from all identified sources collected during summer. (Month 12 – 14).*

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

25% Complete

**Task 5: Monitoring fate (survival, growth, re-growth, and die-off) of E. coli under different environmental conditions**

*Subtask 5.1: Prepare collected samples in Task 4.5 for this monitoring study. (Month 12)*

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

45% Complete

*Subtask 5.2: Measure growth kinetics of E. coli in different sources under varying environmental conditions. (Month 12 – 20).*

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

45% Complete

*Subtask 5.3: Measure survival of E. coli in different sources under varying environmental conditions. (Month 12 – 20).*

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

45% Complete
Subtask 5.4: Measure re-growth of *E. coli* in different sources under optimum conditions. (Month 20 – 26).

The following actions have been completed during this reporting period:
  a. No activity to report this quarter.

0% Complete

Task 6: Monitoring concentration of *E. coli* in the instrumented stream as a result of rainfall and runoff events

Subtask 6.1: Collect water samples during summer for two rainfall-runoff events. (Month 8 - 32).

The following actions have been completed during this reporting period:
  a. No activity to report this quarter.

30% Complete

Subtask 6.2: Collect water samples during winter for two rainfall-runoff events. (Month 8 – 32).

The following actions have been completed during this reporting period:
  a. Storm samples were attempted to be collected on October 23, 2009 but due to equipment malfunctions, the samples were unable to be collected.
  b. Base flow samples were collected on October 27, 2009 from Resley Creek.

20% Complete

Subtask 6.3: Collect stream bed sediments after each water sample collection periods. (Month 8 – 32).

The following actions have been completed during this reporting period:
  a. No activity to report at this time.

35% Complete

Subtask 6.4: Analyze water and sediment for *E. coli* concentrations. (Month 8 – 34).

The following actions have been completed during this reporting period:
  a. No activity to report this quarter.

25% Complete

Subtask 6.5: Measure growth kinetics, survival, and re-growth *E. coli* in stream bed sediments under different environment conditions. (Month 9 – 32).

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

0% Complete

Subtask 6.6: Mechanically disturb stream bed sediments four times; twice each during summer and winter, collect grab water samples, and analyze the samples for E. coli. (Month 9 – 32).

The following actions have been completed during this reporting period:
a. No activity to report this quarter.

30% Complete

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

a. Runoff producing rainfall events have been taking place within the monitoring area but problems with the equipment have prevented samples from being collected.

IV. Projected Work for Next Quarter

- Fecal samples continue to be collected, therefore the laboratory analysis will continue.
- Winter storm and base flow samples will continue to be collected.
- Out of the samples analyzed, some samples will be selected and prepared for monitoring fate of E. coli under different environmental conditions. The growth kinetics and survival of E. coli will be measured under varying environmental conditions and its re-growth will be monitored under optimum conditions.