

**TEXAS STATE SOIL AND WATER CONSERVATION BOARD**



**WORKPLAN**

**FOR THE FY03 CLEAN WATER ACT, SECTION 319(h) PROJECT**

***Bacterial Monitoring for the Buck Creek Watershed  
(Hall-Childress Soil & Water Conservation District)***

***TSSWCB Project # 03- 7***

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**NONPOINT SOURCE SUMMARY PAGE**

**FY04 319 (h)**

1. Title of Project:	Buck Creek Water Quality Sampling / Assessment Project
2. Project Goals/Objectives	<p>(1) To foster coordinated monitoring, sampling, TCEQ assessment and informational activities in the Buck Creek Watershed between the TSSWCB, TCEQ, the Childress, Salt Fork , and Donley SWCDs, Red River Authority (RRA), Texas Water Resources Institute (TWRI), and Texas A&amp;M University System Agricultural Research and Extension Centers (ARECs), El Paso and Vernon</p> <p>(2) To conduct water quality monitoring, sampling of <i>E. coli</i>, and assess options for future watershed action as necessary.</p> <p>(3) Provide technical assistance in implementing a two-year monitoring regime.</p> <p>(4) Compile thorough watershed assessment data that may be used to verify impairment and provide necessary information for TMDL development should it be required.</p> <p>(5) Conduct informational and educational activities with Buck Creek Watershed landowners and other stakeholders.</p>
3. Project Tasks:	<p>(1) Program coordination with project participants.</p> <p>(2) Implementation of targeted water quality monitoring for fecal coliforms and <i>E.coli</i></p> <p>(3) Compilations of TMDL related water quality data within the Buck Creek watershed</p> <p>(4) Assess data as related to the pursuit of further watershed action</p> <p>(5) Provide ongoing educational activities.</p>
4. Measures of Success	Water quality monitoring throughout Buck Creek Watershed; qualify or disqualify the need for further TMDL action within the watershed; and inform landowners and stakeholders of ongoing assessment activities.
5. Project Type:	Statewide (); Watershed (x); Demonstration ()
6. Waterbody Type	River (x); Groundwater (); Other ()
7. Project Location	Segment 0207A of the Buck Creek Watershed
8. NPS Management Program Reference	State of Texas Agricultural/Silvicultural Nonpoint Source Management Program approved February 25, 2000.
9. NPS Assessment Report Status	Impaired (x); Impacted (); Threatened (); Other ()
10, Key Project Activities	Hire Staff (X); Monitoring (X); Regulatory Assistance (); Technical Assistance (); Education (X); Implementation (); Demonstration (); Other ()

11. NPS Management Program Elements	Milestones from the “1999 Texas Nonpoint Source Pollution Assessment Report and Management Program,” which will be implemented include: (1) Coordinating with Federal, State, and Local Programs (2) Committing to technology transfer, technical support, administrative support and cooperation between agencies and programs for the prevention of NPS pollution.
12. Project Costs	Federal (\$247,198); Non-Federal Match (\$140,932); Total Project (\$388,130)
13. Project Management:	Texas Water Resources Institute and Texas State Soil and Water Conservation Board
14. Cooperating Entities:	TSSWCB; TWRI; ARECs; RRA, Hall-Childress, Donley, and Salt Fork SWCDs
15. Project Period:	August 2003 through July 2006

**Bacterial Monitoring for the Buck Creek Watershed**  
Texas State Soil and Water Conservation Board  
FY99 CWA Section 319(h)

**WORKPLAN**

**April 2003 thru March 2006**

**Problem/Need Statement:**

The Red River Basin includes 29 classified segments and 11 major reservoirs covering 145,169 acres. Buck Creek, also known as Spiller Creek, is a small waterbody situated within the Red River Basin and is located within a subwatershed to the Lower Prairie Dog Town Fork of the Red River (Segment 207). This stream segment is located within Ecoregion 27, Central Great Plains. Small streams within this region are typically characterized by widely varying flows and high levels of dissolved salts, generally originating from saltwater seeps and springs. Buck Creek (segment 207A) is situated within a predominantly rural and agricultural landscape in the panhandle region of Texas.

Land use in the watershed is predominantly row crops and grasslands. Temperatures in the region range from 25°F-93°F and rainfall averages approximately 21 inches. During periods of rainfall, bacteria (*E. coli*, specifically) originating from aquatic birds and mammals, livestock, inadequately treated sewage, and/or failing septic systems may be washed into the streams and have the potential to impede recreational use of the waterbody. Bacterial indicators, such as *E. coli*, may remain in the streams in levels exceeding established criteria and can be measured well after a rain event has occurred. These organisms are normally found in wastes of warm-blooded animals and are generally not harmful to human health, but may indicate the presence of pathogens that can cause disease.

The State of Texas requires that water quality in Buck Creek be suitable for fishing, swimming, wading, and a healthy aquatic ecosystem. However, data obtained from water quality monitoring indicates that bacteria levels are sometimes elevated in the creek. Although these data points provide an indicator of a potential water quality problem, the data do not provide conclusive evidence of persistent impairment; rather, it suggests a temporal recurring phenomenon.

**General Project Description:**

Like most states, Texas does not directly monitor pathogens because of the difficulty and expense of measuring them. Instead, it tests for the presence of organisms that indicate the likely presence of pathogens—for example, *E. coli* is typically used as the indicator in the assessment of fresh water. These indicators are used to estimate the relative risk of swimming or other recreation involving direct contact with the water because the probability of becoming ill is greater when the bacteria counts are elevated.

The data used to establish current bacterial loadings in the majority of classified waterbodies across the State is the result of quarterly sampling conducted through the Texas Commission on Environmental Quality (TCEQ)—Clean Rivers Program. Buck Creek is an unclassified waterbody and as such, has not been sampled at the same quarterly intervals as the classified waterbody, into which it flows. Since Buck Creek has been on an intermittent sampling regime, only 20 fecal coliform samples and 14 *E. coli* samples have been collected, from one designated sampling site, within a five-year period.

It has been suggested that a total maximum daily load (TMDL) for bacteria can be done on several impaired segments across the state by using simple, established statistical methods to identify the timing and magnitude of observed exceedances of water quality criteria. While this may be acceptable for waterbody segments that have sufficient data; this waterbody would be better served

with the encouragement of public participation, establishment of targeted monitoring and an educational outreach program.

As the lead agency for the State of Texas in abating agricultural/silvicultural NPS pollution, the TSSWCB works closely with Soil and Water Conservation Districts (SWCDs), in addition to working cooperatively with various state agencies and universities to reduce NPS pollution from various agricultural activities. This project will expand the efforts and activities of TSSWCB; Hall-Childress, Donley, and Salt Fork SWCDs; Red River Authority (RRA); Texas Water Resources Institute (TWRI), Texas Agricultural Experiment Station (TAES) and Texas Cooperative Extension (TCE).

In this project in Phase 1, TWRI and TAES will work with the Texas State Soil and Water Conservation Board and cooperating districts in the collection and analysis of water samples in accordance with an approved Quality Assurance Project Plan (QAPP). TAES will be responsible for collection, analysis, and compilation of water quality data as well as producing reports on project activities. All sites will be monitored for *E. coli* using modified mTEC medium and one site will also be monitored for fecal coliform bacteria using mFC medium.

TAES will be responsible for composing the QAPP, analyzing samples in accordance with the QAPP, and composition of quarterly and final reports for this project. The Hall-Childress SWCD and TCE will collaborate for dissemination of information and educational efforts related to project activities. The SWCD, RRA, and TCE will also aid in contribution to, and review of the final report as deemed necessary.

Following are actions that will be undertaken by this project to assess bacterial nonpoint source pollution within Buck Creek Watershed:

- Monitor water quality as related to bacterial nonpoint source pollution in Buck Creek by in-stream water sampling
- Composition of final report for Phase 1
- Phase 2 if monitoring data from Phase 1 studies demonstrate the need for a TMDL, appropriate follow-up will be planned and implemented. Experts in bacterial source tracking will be involved and advisory to Phase 1 efforts to facilitate TMDL definitions and guidance if needed.

### **Tasks, Objectives, Schedules, and Estimated Costs:**

#### ***TASK 1: Program Coordination***

**Costs:** \$85,000 (Federal), \$45,000 (Match), \$130,000 (Total).

**Objective:** Organize an integrated team among the multiple agencies and groups involved with the project to efficiently and effectively achieve project goals and to summarize activities and achievements made throughout the course of the project.

**Subtask 1.1:** Conduct quarterly meetings as appropriate with project participants, landowners, and other interested parties to discuss water quality monitoring activities, project schedule, lines of responsibility, communication needs, and other requirements. (Month 1 through month 24)

**Subtask 1.2:** TAES will prepare electronic quarterly reports. All progress reports will also be provided to TCE project cooperators and participants, RRA, and Hall-Childress, Salt Fork, and Donley SWCD directors. (months 1 thru 24)

**Subtask 1.3:** TCE will provide leadership for educational programs about water pollution and project findings.

**Subtask 1.4** TAES and TCE will develop an electronic final report, which will include an executive summary of the data collected during the project and educational program.

**Subtask 1.5** TSSWCB, TWRI, RRA, and local SWCDs will assist, when needed, with composition, editing, and publication of final report (month 1 thru 24).

**Deliverables:**

- Quarterly Reports
- Monthly progress reports
- Copies of agendas, attendance, and minutes from all meetings
- Final Report

***TASK 2: Micro-Watershed Monitoring and Sampling***

**Costs:** \$162,198 (Federal), \$95,932 (Match), \$258,130 (Total)

**Objective:** To develop Data Quality Objectives (DQO) and Quality Assurance Project Plan (QAPP), monitor micro-watersheds for data collection and analysis, and provide data to inform district and landowners of any potential or existing water quality issues and/or problems.

**Subtask 2.1** Develop DQOs and a QAPP to be approved by USEPA (Start Date: Month 1; Completion Date: Month 3).

**Subtask 2.2:** Select 12 or 13 sites to conduct water quality sampling. Maintain water quality monitoring equipment and collect water samples. (Month 1 through month 24)

**Subtask 2.3** TAES will obtain sampling locations and deploy in accordance with arrangements made. (Start Date: Month 4; Completion Date: Month 21).

**Subtask 2.4** TAES will perform routine sampling, (grab sampling) at strategic locations within the Buck Creek watershed. Samples will be collected at each site every two weeks for a 24-month duration. (Start Date: Month 4; Completion Date: Month 21).

**Subtask 2.5** TAES will collect a minimum of 8 rain event/high flow grab samples from the sites over the course of the study. (Start Date: Month 4; Completion Date: Month 25)

**Subtask 2.6** TAES will compile and analyze the sampling data. Data will be for informational and assessment purposes due to the limited data previously collected. (Start Date: Month 4; Completion Date: Month 24).

**Deliverables**

- Approved QAPP
- Data Report

**Coordination, Roles and Responsibilities:**

Participating organizations and agencies along with their roles in this project include:

- **Texas State Soil & Water Conservation Board**—Project oversight
- **Texas Water Resources Institute**—Project coordination and report writing
- **Texas Agricultural Experiment Station**—Water quality monitoring and report preparation
- **Texas Cooperative Extension**—Educational program leadership
- **Hall-Childress, Donley, and Salt Fork SWCDs**—Assist with project oversight and dissemination of information and educational efforts related to project activities
- **Red River Authority**—Participation in project meetings and report review.

**Public Participation:** Information about the monitoring project will be provided to the general public and selected audiences to inform and educate them to facilitate public involvement in the pollution control program.

**Measures of Success:**

- (1) Analysis of samples in accordance with QAPP
- (2) Unified and complete assessment of water quality within Buck Creek
- (3) Documented educational activities

**Reference to Project in the NPS Management Program:**

Category: Agriculture

**Project Managers:**

Name: Kevin Wagner, Project Leader  
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 Texas State Soil and Water Conservation Board  
 FY 03 CWA Section 391(h)

**BUDGET Revision # 3**  
**Revision Date: August 29, 2007**  
**August 2003 through September 2007**

	<b>Federal</b>	<b>Non-Federal Match</b>	<b>Total</b>
<b>1. Personnel</b>	135,870	41,865	177,735
<b>2. Fringe Benefits</b>	30,601	9,936	40,537
<b>3. Travel</b>	2,953	0	2,953
<b>4. Equipment</b>	0	0	0
<b>5. Supplies</b>	38,419	0	38,419
<b>6. Contractual</b>	0	0	0
<b>7. Construction</b>	0	0	0
<b>8. Other Direct Costs</b>	7,112	0	7,112
<b>9. Total Direct Costs</b>	214,955	51,801	266,756
<b>10. Indirect costs (allowable @15%)</b>	32,243		32,243
DHHS Rate @ 45.5%		23,570	23,570
Difference of IDC Allowed & DHHS Rate @ 30.5%		65,561	65,561
<b>11. Total</b>	\$247,198	\$140,932	\$388,130

**Bacterial Monitoring for the Buck Creek Watershed**  
 Texas State Soil and Water Conservation Board  
 FY01 CWA Section 319(h)

**BUDGET JUSTIFICATION**

1. Personnel. Personnel breakdown presented below in tabular format. The Research Technician and Extension Assistant/Associate positions may be combined into one position.

Position title	Pay rate/month	Percent Effort
Direct		
Associate Professor	\$5,833	4.16
Agricultural Research Technician II	\$2,333	83.0
Extension Assistant	\$2,333	17.0
Project Monitor/Science Writer	\$3,192	7.5
Non-Federal Match		
Professor, Vernon	6,682	8.3
Research Associate, Vernon	\$2,658	16.7

2. Fringe benefits.  
 Fringe benefits calculated at actual cost, 15.5% of salaries. Medical insurance, \$426/person/month. See <http://sago.tamu.edu/soba/IDC/fringe-benefits-FY2003.htm>.
3. Travel.  
 Nonfederal match provided by use of Texas Cooperative Extension vehicle.  
 Sampling trips. Travel to 13 sampling sites, 6 or 7 sites per week, alternating weeks, 240 miles each trip, 52 trips/year, 3 years. Overnight stays projected for 75% of sampling trips.  
 Meetings. 4 meetings/year, travel by two researchers and research associate.  
 Per diem: \$80 lodging; \$30 meals.  
 All vehicle travel expenses will follow state rate of reimbursement @ \$0.35/mile
4. Equipment. None
5. Supplies. Match partially furnished by lab furnishings from Munday Station and existing lab facilities at TAES Vernon, as shown in the attached table. Glass labware from Munday Station is shown at replacement cost. Lab furnishings are shown at a median replacement cost.
- a. Lab supplies: Incubator, water-jacketed; incubator, general purpose; spore check biological indicators; compact autoclave; autoclave tape; autoclave trays; autoclave bags; heat gloves; autoclave thermometer; salinity meter; dissolved oxygen meter; forceps filter; disposable funnel filters; vacuum pump; sterile supplies; colony counting system; filter manifold; modified agar plates; petri dish trays; lab refrigerator for El Paso lab.

- b. Collection supplies: laptop computer; hand-held data loggersoftware, and printer for data collection; batteries; pH meter, multiparameter meter (DO, salinity, and conductivity w/ 100ft. cable), cell phone, GPS software, water scoop, ice chests and blue ice packs; plastic disposables.
- c. Educational supplies for demonstrations by Extension Assistant: paper, sample bottles, posterboard, film and processing.

Office supplies.

- 6. Contractual. None
- 7. Construction. None.
- 8. Miscellaneous. None.
- 9. Indirect Costs.

Indirect costs: direct 15% per guidelines, remaining 30.5% waived indirect costs attributed to match.