Assessment of Springtime Contributions of Nutrients and Bacteria to the North Bosque River Watershed

(Formerly Little Wichita River Watershed Protection Plan)

FY04 CWA Section 319(h)

WORK PLAN 04-12

Amendment to Scope of Work with 1-yr No Cost Extension – revised 9 February 2007

August 25, 2004 – August 31, 2008 (former end date Aug. 31, 2007)

1. **Title of Project:** Assessment of Springtime Contributions of Nutrients and Bacteria to the North Bosque River Watershed (formerly Little Wichita River Watershed Protection Plan)

2. **Project Goals/Objectives:** This project will provide storm and routine monitoring of tributaries that contribute nonpoint source (NPS) loadings to the North Bosque River, an impaired stream, in order to assess agricultural NPS reductions. This project will focus on springtime contributions of nutrients and bacteria to water quality within tributaries of the North Bosque River assessing reductions in pre- and post-TMDL implementation periods.

3. **Project Tasks:** (1) Project Administration, (2) Quality Assurance, (3) Data Collection, and (4) Assessment

4. **Measures of Success:** Demonstrate significant improvement in water quality associated with implementation of BMPs on agricultural operations that land-apply animal waste through the evaluation of monitoring data from tributaries of the North Bosque River comparing pre- and post-TMDL implementation periods.

5. **Project Type:** Statewide ( ) Watershed (X) Demonstration ( ) Other ( )

6. **Waterbody Type:** River (X) Groundwater ( ) Other ( ) – river and reservoir system

7. **Project Location:** North Bosque River, Segment 1226; Upper North Bosque River, Segment 1255.

8. **NPS Management Program Reference:** *Texas Nonpoint Source Pollution Assessment Report and Management Program* approved October 1999.

9. **NPS Assessment Report Status:** Impaired (X); Impacted ( ); Threatened ( ); TMDL ( ); Other ( )

10. **Key Project Activities:** Hire Staff ( ); Monitoring (X); Regulatory Assistance ( ); Technical Assistance ( ); Education ( ); Implementation ( ); Demonstration ( ); Other ( ).

11. **NPS Management Program Elements:** Milestones from the *Texas Nonpoint Source Pollution Assessment Report and Management Program* to be implemented include: (1) coordinating watershed and microwatershed monitoring and modeling for agricultural/silvicultural NPS pollution, (2) utilizing data derived from monitoring and modeling to support NPS pollution abatement and prevention activities in priority watersheds, (3) coordinating with federal, state, and local programs, and (4) committing to

technology transfer, technical support, administrative support, and cooperation between agencies and programs for the prevention of NPS pollution.

12. **Project Costs:** Federal ($90,090); Non Federal ($60,059); Total Project ($150,149)

13. **Project Management:** Texas Institute for Applied Environmental Research (TIAER) at Tarleton State University. Cooperating Entities: Texas State Soil & Water Conservation Board (TSSWCB).

14. **Project Period:** August 25, 2004 – August 31, 2008, no cost extension (previous end date August 31, 2007).

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Amendment to Scope of Work with 1-yr No Cost Extension – revised 9 February 2007

August 25, 2004 – August 31, 2008 (former end date Aug. 31, 2007)

Problem/Need Statement:

The North Bosque River watershed encompasses approximately 3,140 square kilometers (1,210 square miles) in north central Texas and includes two classified stream segments (1226 and 1255; Figure 1). The 1996 State of Texas Water Quality Inventory indicated that nonpoint source loadings associated with elevated nutrient and fecal coliform levels were the most serious threat to meeting designated uses within segments 1226 and 1225. In 1998, segments 1226 and 1255 were included in the Clean Water Act Section 303(d) list for Texas as impaired water bodies and scheduled for development of total maximum daily loads (TMDLs). These two segments were listed under narrative water quality criteria related to nutrients and aquatic plant growth with concentrated animal feeding operations identified as the major nonpoint source of nutrients. In February 2001, the Texas Commission on Environmental Quality (TCEQ) adopted a TMDL for soluble reactive phosphorus in segments 1226 and 1255 that was approved by EPA in December 2001. This TMDL requires about a 50 percent reduction in loading and concentration of soluble reactive phosphorus, depending on the location along the river. Soluble reactive phosphorus was identified as the nutrient limiting algal growth in the North Bosque River, and, thus, a reduction in soluble reactive phosphorus should reduce algal abundance in the North Bosque River. The 2004 Texas Water Quality Inventory assessment prepared by the TCEQ pursuant to the Clean Water Act Section 305(b) continues to indicate impairments associated with bacteria and concerns associated with nutrient enrichment and algal growth on stream segments in the North Bosque River watershed. Although the TMDL process did not directly consider bacteria with regard to supporting the use of contact recreation, many of the control practices for phosphorus outlined in the Implementation Plan should also help reduce bacterial loadings to the North Bosque River.

The basis for this project is to provide assessment activities in the North Bosque River watershed to support the Texas State Soil and Water Conservation Board (TSSWCB) and local Soil and Water Conservation Districts (SWCDs) in efforts to reduce agricultural nonpoint source (NPS) pollution loadings. This project represents a continuation of an effort outlined in the TMDL Implementation Plan using a microwatershed approach to target water quality monitoring and agricultural producer assistance to help reduce phosphorus loadings to the North Bosque River. This specific effort focuses on monitoring microwatersheds to target areas needing BMP implementation associated with springtime manure and fertilizer applications. Manure and fertilizer are often applied in the spring to provide nutrients for crop growth and development.

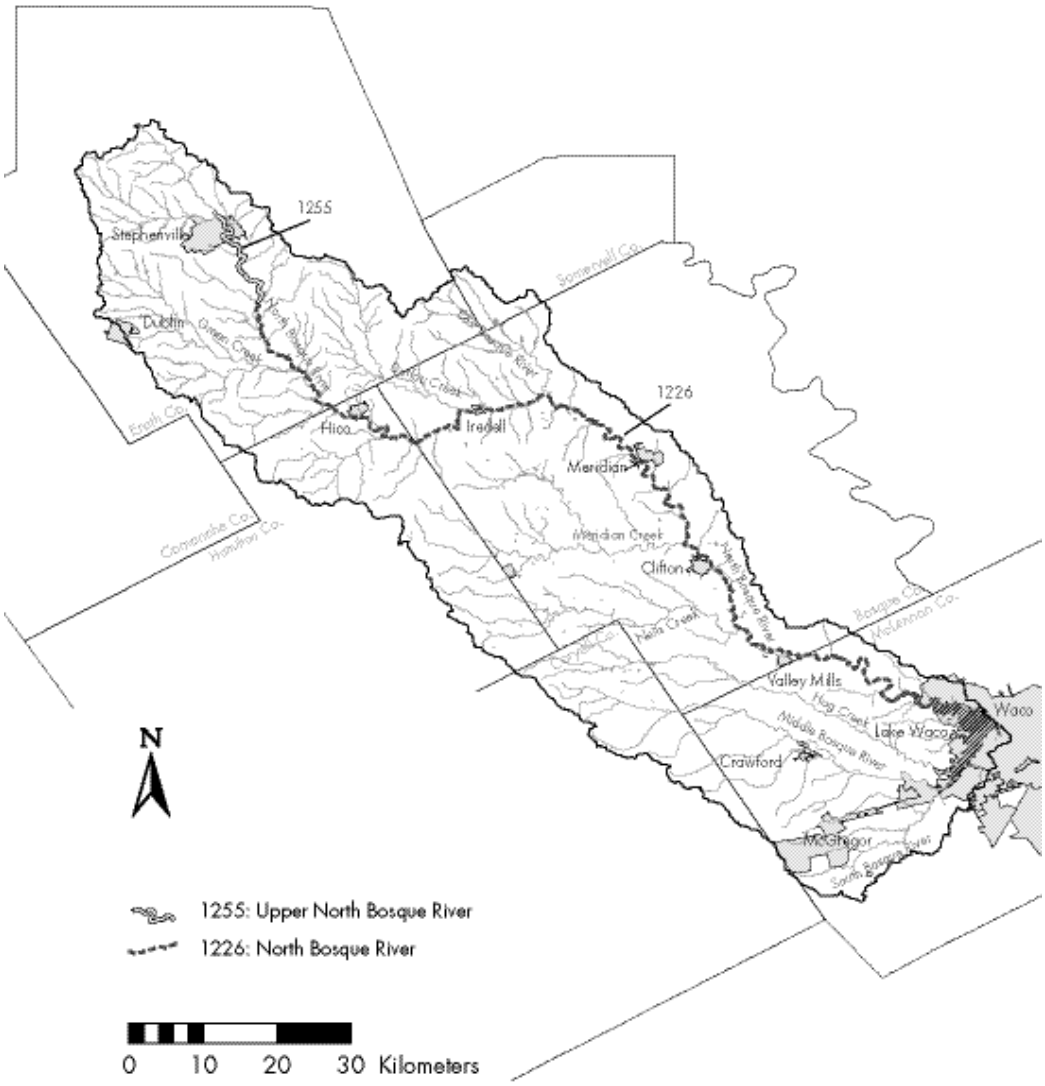

Figure 1. Classified stream segments along the North Bosque River.

Within the upper portion of the North Bosque River watershed, where most of the dairy operations are located, spring and early summer rains can be quite heavy and intense contributing potentially large amounts of runoff from agricultural fields to streams and tributaries. Historically, the month with the greatest rainfall is May (Figure 2). Fertilizer application (either as manure or commercial) is generally recommended in April or May in the North Bosque River watershed depending on the crop being grown. To evaluate improvements associated with Implementation Plan practices, such as nutrient management of manure and fertilizer, focused monitoring and assessment efforts are needed of springtime contributions of nutrients and bacteria.

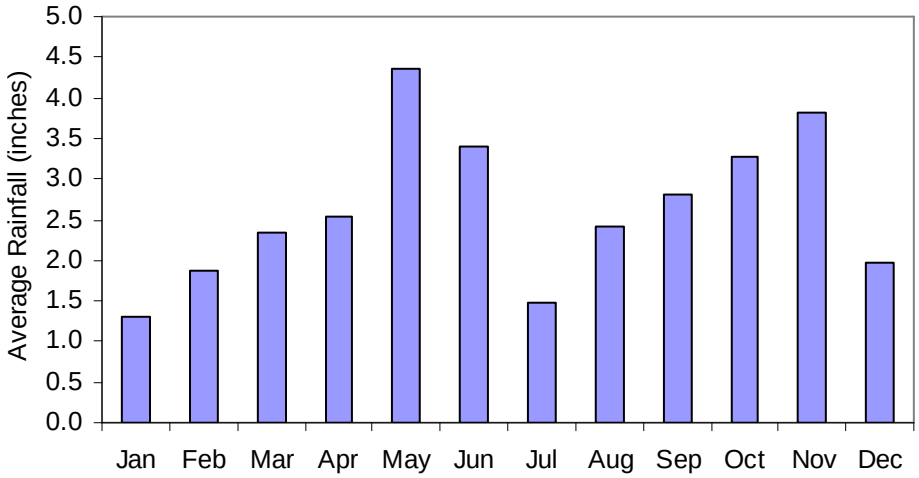

Figure 2. Long-term average monthly rainfall (1971-2000) for Stephenville, Texas (Source: National Weather Service).

General Project Description:
The primary focus of this 319(h) project is to assess the preexisting and post-TMDL implementation effects at the microwatershed level. A secondary focus is to provide TSSWCB and local SWCDs with support in targeting areas needing water quality improvement.

In this project, TIAER will provide continued assessment activities at 18 microwatershed sites within the North Bosque River (Figure 3). The monitoring effort will be a continuation of a current 319 project (FY01-17, Extending TMDL Efforts in the North Bosque River Watershed) that ends in March 2008. The proposed project will extend monitoring of microwatershed sites through June 2008 to allow monitoring of spring and early summer nonpoint source contributions. The report for this project will focus specifically on improvements in water quality associated with spring and early summer runoff events pre- and post-TMDL implementation, while the focus of FY01-17 report will more broadly assess step-trends in water quality using year-round base and storm event data.

The monitoring effort will make use of numerous automated sampling systems in TIAER's possession that will be made available to this project. Historical or nondirect data obtained from other projects with approved EPA or the State of Texas QAPPs will also be used to supplement this project. The data collected for this project will be used to determine the reduction of NPS pollution associated with post-TMDL implementation efforts and provide data to inform TSSWCB of areas where focused reduction efforts are most needed.

These 18 microwatersheds represent a variety of land uses within the watershed and provide focused monitoring in the upper portion of the North Bosque River watershed where most dairy operations are located (Table 1). Most of these stream sites have been monitored since April or May 2001, although some sites have a monitoring history extending back to 1991 (Table 2). The historical water quality data available at these sites has been collected by TIAER and will be

made available as non-direct data to this project for use in the assessment of water quality improvements.

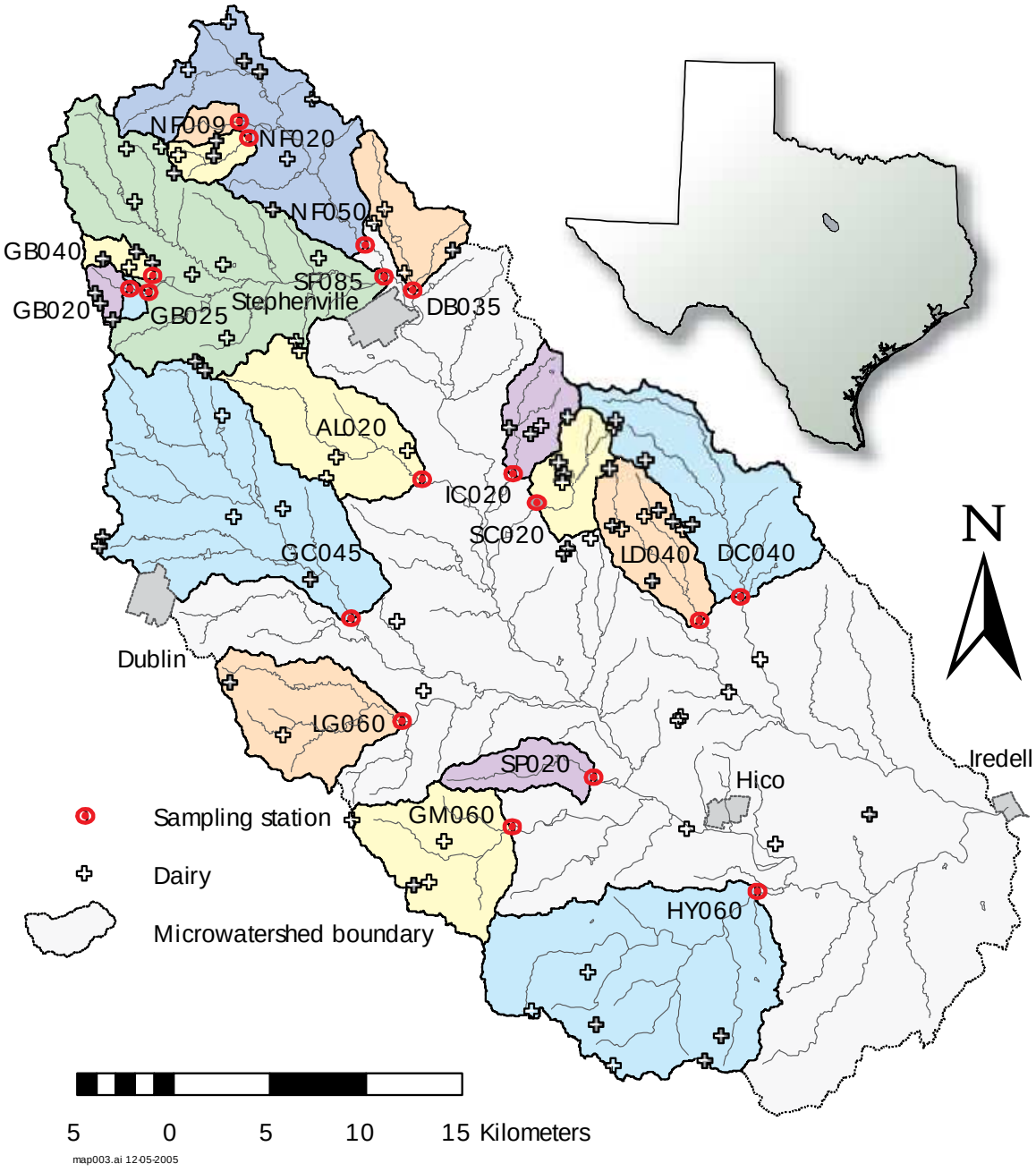

Figure 3. Location of microwatershed sampling sites within the upper portion of the North Bosque River watershed.

Table 1. Estimated land use and drainage area above sampling sites.

TIAER Site ID	Wood & Range (%)	Pasture (%)	Cropland (%)	Dairy Waste App. Fields (%)[a]	Urban (%)	Other (%)	Total Area (Hectares)
AL020	57.6	23.0	7.4	11.4	0.7	0.0	4,720
DB035	46.2	24.1	12.8	14.0	2.3	0.6	2,130
DC040	72.5	4.8	7.1	14.9	0.6	0.0	6,250
GB020	40.6	17.7	0.6	40.6	0.6	0.0	440
GB025	29.5	13.5	0.6	55.9	0.5	0.0	660
GB040	21.1	42.8	4.9	30.2	0.7	0.1	540
GC045	61.5	22.2	8.4	6.4	0.9	0.5	11,900
GM060	78.1	13.3	2.8	5.7	0.1	0.0	4,410
HY060	71.7	12.9	12.3	2.9	0.1	0.1	11,800
IC020	64.9	16.8	6.1	11.8	0.3	0.0	1,740
LD040	59.3	5.4	5.5	29.6	0.1	0.1	2,960
LG060	66.2	16.7	9.4	7.1	0.1	0.5	4,260
NF009[b]	58.4	27.2	11.4	2.7	0.2	0.0	520
NF020	29.7	14.2	3.3	52.6	0.1	0.1	800
NF050	45.6	34.1	8.3	11.2	0.3	0.6	8,370
SC020	68.7	9.4	1.4	20.0	0.1	0.4	1,900
SF085	50.6	26.5	5.6	14.3	2.2	0.7	12,900
SP020[c]	82.6	12.0	5.2	0.0	0.1	0.1	1,560

[a] Information on dairy waste application fields within microwatersheds was obtained from dairy permits and dairy waste management plans on record with the TCEQ as of May 2000.
[b] Site NF009 represents a microwatershed stream site with minimal impact from dairies but with impact from other agricultural practices for comparison.
[c] Site SP020 represents a least impacted or reference microwatershed stream site for comparison as a control.

Table 2. Location and sampling history of monitoring sites.

TIAER Site ID	TCEQ ID	Watershed and General Location	Date of First Grab Sample	Date of First Automatic Storm Sample
AL020	17604	Alarm Creek at FM 914	14-May-01	5-Sep-01
DB035	17603	Dry Branch near FM 8	2-Apr-02	5-Feb-02
DC040	17607	Duffau Creek at FM 2481	16-Apr-01	7-May-01
GB020	17214	Unnamed tributary to Goose Branch between CR 541 and CR 297	11-May-95	5-May-95
GB025	17213	Unnamed tributary to Goose Branch near end of CR 297	12-Feb-97	19-May-97
GB040	17215	Goose Branch downstream of FM 8	12-Feb-97	6-Feb-97
GC045	17609	Green Creek upstream of SH 6	16-Apr-01	26-May-01
GM060	17610	Gilmore Creek at bend of CR 293	5-Feb-01	31-Aug-01
HY060	17611	Honey Creek at FM 1602	16-Apr-01	4-May-01
IC020	17235	Indian Creek downstream of US 281	8-Jun-94	18-Oct-93[a]
LD040	17608	Little Duffau Creek at FM 1824	14-May-01	31-Aug-01
LG060	17606	Little Green Creek at FM 914	14-May-01	14-Jul-01
NF009	17223	Unnamed tributary of Scarborough Creek at CR 423	18-Apr-91	16-May-92[b]
NF020	17222	North Fork North Bosque River Scarborough Creek at CR 423	30-Oct-91	19-May-92
NF050	17413	North Fork of North Bosque River at SH 108	4-Apr-91	7-Jun-91[c]
SC020	17240	Sims Creek upstream of US 281	21-Sep-94	17-Jan-95[a]
SF085	17602	South Fork of North Bosque River at SH 108	30-Apr-01	26-May-01
SP020	17242	Spring Creek at CR 271	8-Jun-94	20-Oct-93[a]

[a] Storm sampling suspended from March 3, 1998 to May 3, 2001 at IC020 and SP020 and from March 3, 1998 through May 12, 2001 at SC020.
[b] Storm sampling at NF009 was suspended from March 25, 1998 through June 12, 1998.
[c] Storm sampling at NF050 was suspended from February 9, 1997 through May 4, 2001.

The monitoring activities of this project will consist of automated stormwater sampling, some grab storm sampling, biweekly (once every two weeks) ambient grab sampling, and continuous streamflow measurements. Field measurements of dissolved oxygen, water temperature, specific conductance, and pH will occur with all grab sampling. Stormwater samples from automated samplers will be retrieved on a daily basis and flow composited into a single sample. All biweekly grab and automated storm samples will be analyzed for various nutrient forms (i.e., total phosphorus, dissolved orthophosphate phosphorus [frequently referred to as soluble reactive phosphorus], total Kjeldahl nitrogen, dissolved ammonia, dissolved nitrite plus nitrate), and total suspended sediments (TSS). The nitrogen forms are included in the laboratory analyses to provide a more complete indication of macronutrient conditions in the watershed, to evaluate whether agricultural BMPs are reducing both nutrients (nitrogen and phosphorus), and to ensure that efforts to reduce one nutrient is not inadvertently increasing another. In addition, grab samples will be collected and analyzed for *E. coli* as part of routine monitoring and during elevated flows associated with storm events to evaluate bacteria concentrations.

Project staff will also maintain equipment to record continuous water level information and take required measurements to maintain and update, as needed, existing stage-discharge relationships (rating curves) at all stations. Historical data obtained from the microwatershed monitoring will be used to establish baseline nutrient and bacteria concentrations within these smaller streams and tributaries that contribute flow to 303(d) listed classified segments within the watershed. As implementation of BMPs progress, the direct microwatershed monitoring associated with this project will more effectively measure the success of agricultural BMPs by removing the cumulative effect of urban NPS pollution and wastewater treatment plant contributions associated with stream sites along the main stem of the North Bosque River.

Tasks, Objectives, Schedules, and Estimated Costs:

Task 1: Project Administration

Costs: Federal $3,544; Non-Federal $2,363; Total $5,906

Objective: To effectively coordinate and monitor all work performed under this contract including technical and financial supervision, preparation of status reports, and maintenance of project files and data. Progress reports shall document all activities performed within a quarter. Quarterly reports will be initiated in January 2008 for the revised project. Prior to December 2007, no activity is planned. As of January 2008, quarterly reports will be due by the 15th of January, April, and July 2008 based on Federal fiscal quarters (Oct.-Dec., Jan.-Mar., Apr.-Jun., and Jul.-Sep.). The final project report due in August 2008 will act as the final progress report for the project.

> **Task 1.1:** TIAER will submit quarterly Progress Reports, which will include the status of deliverables for each objective and a narrative description of the progress on each task.
>
> **Task 1.2.:** TIAER will submit appropriate Reimbursement Forms.

Deliverables

- Quarterly progress reports due to TSSWCB 15th day following the end of the Federal fiscal quarters (October-December; January-March; April-June; July-September).
- Quarterly reimbursement statements and necessary documentation based on Federal fiscal quarters.

Task 2: Quality Assurance

Costs: Federal $1,772; Non-Federal $1,181; Total $2,953

Objective: To develop Data Quality Objectives (DQO), a Quality Assurance Project Plan (QAPP), and provide amendments to the QAPP, as needed. An annual revision to the QAPP will not be needed, since monitoring under this project will occur for less than a year. Because this project is an extension of a previous 319(h) project with an approved QAPP, the previous QAPP will be modified and used for this project with the goal of having it approved by April 1, 2008, so sampling may continue seamlessly between projects without a gap in time. The previous project ends March 31, 2008.

Task 2.1: Develop data quality objectives and submit a draft Quality Assurance Project Plan for review by the TSSWCB and EPA at least two months prior to the initiation of the project.

Task 2.2: Revise QAPP for approval by the TSSWCB and EPA and finalize by April 1, 2008.

Task 2.3: Provide amendments of the QAPP, as necessary, to the TSSWCB and EPA.

Deliverables

- Approved QAPP
- Approved amendments to QAPP

Task 3: Data Collection

Costs: Federal $58,717; Non-Federal $39,145; Total $97,862

Objective: To perform routine grab and storm assessment activities at stream sampling sites including collection of flow and associated measurements for maintaining stage-discharge relationships. Direct sampling under this project is planned to start in April 1, 2008, assuming an approved QAPP is in place, and continue until June 30, 2008.

Task 3.1: TIAER will perform routine biweekly grab sampling at all 18 stream sites (Figure 1). Water quality samples will be collected only if water is flowing. If water is not flowing when biweekly sampling is scheduled, a water quality sample will not be collected, but it will be documented that the stream is pooled or dry. Routine grab samples will be analyzed for nutrient forms, and TSS. In addition, field constituents of dissolved oxygen, pH, conductivity, and water temperature will be recorded at the time grab samples are collected.

Based on a historical review, these sites are generally dry or not flowing about 40 percent of the time when visited for routine grab sampling. Based on this information, a maximum of 60 grab samples over the three months of sampling were budgeted for the project. If stream conditions during the project lead to the potential for more samples than the maximum anticipated for routine grab samples, modifications to the sampling design will occur. These modifications may include reducing the number biweekly sampling events or reducing the number of sites sampled during a biweekly event to reduce sample load while maintaining representative sampling to meet project objectives.

Task 3.2: TIAER will maintain and operate automated samplers and water-level recorders at all 18 stream sites. Automated samplers will be set to activate sampling upon a small rise in water level and collect individual samples at sequential time intervals. At each stream site, individual stormwater samples will be collected daily and flow composited into one sample that will be analyzed for nutrient forms and TSS. Due to the unpredictable nature of wet weather monitoring, TIAER is not able to guarantee a set number of wet weather samples from each station. Based on historical data the project is budgeted to collect and analyze a maximum of 195 storm samples. If stream conditions such as those resulting from appreciably greater than average rainfall result in more samples than budgeted, corrective measures, such as discarding samples from small runoff events, will be implemented to reduce sample load while maintaining representative sampling over the duration of the project.

Task 3.3: Stage-discharge relationships will be maintained and updated, as necessary, for all stream sites. This will include taking flow measurements and re-surveying stream cross-sections, if apparent changes have occurred.

Task 3.4: TIAER will conduct routine general maintenance of all automated sampling and water level equipment to help ensure that these instruments will operate properly during storm water conditions.

Task 3.5: TIAER will collect grab samples for analysis of *E. coli* as part of routine biweekly sampling and during elevated flows associated with storm events. Storm samples for *E. coli* will be collected once per day during elevated flows with sampling continuing at least one day after flow levels have receded (assuming flow is still occurring) to evaluate changes in *E. coli* concentrations with changes in flow. To accommodate lab and field staff due to the relatively short holding times associated with bacteria samples (8 hours), storm sampling of bacteria will occur only during the standard work week (Monday – Friday) and not on weekends. Modifications to this sampling regime may also occur to accommodate available incubator and laboratory space, if an extended wet-weather period is encountered. A maximum of 60 routine and 195 storm grab samples will be analyzed for *E. coli*. If wet-weather conditions lead to the potential for more samples than the budgeted maximum, modifications to the sampling design, such as reducing the number of sites or the number of events analyzed will be taken to reduce sample load while maintaining representative sampling to meet project objectives.

Deliverables

- A water quality data summary for each site will be submitted to the TSSWCB as part of TIAER's semiannual water quality report of assessment activities in the Bosque River watershed.

Task 4. Assessment

Costs: Federal $26,057; Non-Federal $17,371; Total $43,428

Objective: Develop a report assessing the impact of post-TMDL implementation activities on stream water quality focusing on springtime contributions.

Task 4.1: During the last few months of the project, TIAER will develop a final project report that will evaluate the success of post-TMDL implementation activities on water quality at microwatershed stream sites. A draft of this report will be submitted to the TSSWCB for review at the end of the project. All TSSWCB comments will be considered and addressed before finalizing the report.

Deliverables

- Draft and final project report.

Project Management:
Laurie Fleet – 319 Project Planner
Texas State Soil and Water Conservation Board
P.O. Box 658
Temple, TX 76504
254-773-2250 ext 247
254-773-3311 (fax)
lfleet@tsswcb.state.tx.us

Project Lead:
Anne McFarland
Texas Institute for Applied Environmental Research
Tarleton State University
P.O. Box T-0410
Stephenville, TX 76402
254-968-9581
254-968-9559 (fax)
mcfarla@tiaer.tarleton.edu

Assessment of Springtime Contributions to the North Bosque River Watershed
Schedule of Milestones
August 25, 2004 – August 31, 2008

Task	Project Milestones	Start	End
1	Quarterly Progress Reports	Aug. 25, 2004	Aug. 31, 2008
2	Approved QAPP	Dec. 1, 2007	March 31, 2008
3	QAPP Amendments	Apr. 1, 2008	Jun. 30, 2008
3	Monitoring Activities	Apr. 1, 2008	Jun. 30, 2008
4	Final Assessment Report	Jun. 1, 2008	Aug. 31, 2008

Springtime Assessment of the North Bosque River
TSSWCB Project #04-12 (TIAER)
OBJECT CLASS BUDGET New Budget revised 09Feb2007
Term of Contract: Aug. 2004 - Aug. 2008

Table 3. Revised Project Budget for WORK PLAN 04-12
Assessment of Springtime Contributions to the North Bosque River Watershed
(Formerly Little Wichita River Watershed Protection Plan)
FY04 CWA Section 319(h)
Amendment to Scope of Work with 1-yr No Cost Extension – revised 9 February 2007
August 25, 2004 – August 31, 2008 (former end date Aug. 31, 2007)

Description	Federal*	State*	Total*
1. Personnel/Salary	**$56,915**	**$17,064**	**$73,979**
2. Fringe Benefits	**$13,170**	**$3,949**	**$17,119**
3. Travel	**$5,315**	**$1,475**	**$6,790**
4. Equipment	**$0**	**$0**	**$0**
5. Supplies	**$6,124**	**$4,082**	**$10,206**
6. Contractual	**$0**	**$0**	**$0**
7. Construction	**$0**	**$0**	**$0**
8. Other	**$376**	**$251**	**$627**
9. Total Direct Costs (sum 1-8)	**$81,900**	**$26,821**	**$108,721**
10. Indirect Costs**	**$8,190**	**$33,238**	**$41,428**
11. Total (sum 9-10)	**$90,090**	**$60,059**	**$150,149**

*** Budget includes money already spent as part of the original project and future project expenses.**
**** Total indirect based on 56% of personnel. Federal portion calculated as 10% of total federal direct costs.**

Itemized Budget Justification

About 50 percent of the project budget is associated with personnel. At the time this work plan was amended, $13,435 within the personnel category ($9,336 federal and $4,099 state) had been spent on the original Little Wichita Project. The following outlines the personnel expenses and time commitments associated with the revised scope of work for assessment monitoring within the North Bosque River watershed. Although the contract period covers multiple years, the revised scope of work will predominately occur between December 2007 and August 2008. The percent time for individuals reflects their commitment to this project for the 9 months between December 2007 and August 2008.

Name	Title	Estimated Hours	Estimated Percent Time for 9 months
Adams, T.	Research Associate	39	3%
Bethel, W.	Research Associate	15	1%
Easterling, N.	Research Associate	123	8%
Gosdin, D.	Computer Graphics Specialist	8	1%
Hauck, L.	Assistant Director	12	1%
Hunt, V.	Technician	135	9%
Hunter, J.	Sr. Research Assistant	135	9%
Jones, T	Sr. Research Associate	132	8%
Kennedy, L.	Database Manager I	72	5%
Lewis, L.	Research Assistant	159	10%
Martinez, A.	Sr. Research Assistant	150	10%
McFarland, A.	Research Scientist	416	27%
Millican, J.	Senior Research Associate	314	20%
Murphy, M.	Lab Manager	171	11%
Reynolds, D.	Research Assistant	135	9%
Rogers, J.	Senior Analyst/Programmer	90	6%
Stroebel, J.	Research Associate	120	8%
Swanson, D.	Information Specialist	24	2%
Student Workers	Field Crew	90	4%
	Laboratory	90	4%
	Data Management	60	3%

As the project leader within the revised scope of work Dr. Anne McFarland, Research Scientist, will provide project administration, coordination, and technical oversight as outlined in Task 1. Dr. Larry Hauck, Assistant Director at TIAER, will provide guidance to Dr. McFarland, as needed, for project oversight and will review the final report prior to submittal to the TSSWCB. Data storage and database management under Task 1 will be conducted by Mr. Jim Rogers, Senior Programmer/Analyst, and Mr. Larry Kennedy, Database Manager I. Ms. Nancy Easterling, TIAER's Quality Assurance officer, will be assisting Dr. McFarland in data review under Task 1 and QAPP development under Task 2. A student worker also assists Ms. Easterling with quality assurance data reviews. Dr. McFarland will be the primary author of the final project report under Task 4 with assistance in data analysis provided by Mr. Jimmy Millican, Senior Research Associate. Mr. Don Gosdin will assist with any needed graphics for the final report.

TIAER's field operations staff will conduct the assessment monitoring and all samples will be analyzed in TIAER's analytical laboratory. Sample analyses include nutrients, TSS, and *E. coli* under Task 3. Mr. Tim Jones, Sr. Research Associate, is the supervisor of field operations and will oversee field efforts for routine and storm monitoring. The field staff includes three full-time employees (Jeff Stroebel, Abel Martinez, and Levi Lewis) and generally two student workers. As needed, other TIAER staff members who are trained in field techniques (William Bethel, Jimmy Millican, and Todd Adams) will be available to assist with routine and storm monitoring. The TIAER analytical laboratory is staffed by a lab manager (Mark Murphy), two chemists (Jeff Hunter and Dovie Reynolds), and a research technician (Vickie Hunt). The analytical laboratory also generally employs two to four student workers. Dianne Swanson is TIAER's information specialist, but also fulfills the role as TIAER's laboratory quality assurance officer.

An appreciable supplies budget (a little over $10,000 in total project funds) is necessary for field and laboratory supplies associated with monitoring. The travel budget is associated primarily with travel to and from sampling sites for sample retrieval and general maintenance. The travel budget also includes one trip to Temple to meet with TSSWCB personnel. Other expenses of about $2,000 (total project funds) are for vehicle and laboratory equipment maintenance, laboratory waste disposal, and miscellaneous charges such as postage and freight.

No equipment is needed for the project. TIAER will be providing the 18 automated samplers and the associated level recorders needed the for storm water monitoring.

The total revised budget by major category is provided below (Table 3). Changes in the federal and state portions of the budget from the original budget are noted in the attached Budget Transfer forms.