



**Texas State Soil and Water Conservation Board
Clean Water Act §319(h) Nonpoint Source Grant Program
FY 2009 Project Workplan 09-04**

NONPOINT SOURCE SUMMARY PAGE for the CWA §319(h) Agricultural/Silvicultural Nonpoint Source Grant Program					
Title of Project:	Development and Implementation of an Environmental Training Program for Manure and Compost Haulers/Applicators in the Texas High Plains				
Project Goals:	<p>To facilitate the development and implementation of an education, training and demonstration program to improve the understanding of environmental protection principles by manure/compost haulers, equipment operators, certified crop advisors (CCAs) and crop producers.</p> <ul style="list-style-type: none"> • Assess the current level of environmental knowledge of custom manure/compost haulers and the extent of training provided to equipment operators. • Design and develop an environmental training curriculum for custom manure/compost hauler owners, equipment operators, CCAs and crop producers, including materials in Spanish. • Promote adoption of sound water quality protection practices by custom manure/compost haulers, equipment operators, CCAs and crop producers through program delivery in at least two pilot watersheds. • Utilize workshops, field days and hands-on demonstration of best management practices and ensure availability of education materials through website. 				
Project Tasks:	(1) Project Administration; (2) Quality Assurance; (3) Environmental Knowledge Assessment; (4) Project Advisory Group; (5) Manure Spreader Calibration Kits; (6) Curriculum Development; (7) Demonstration and Program Delivery; (8) Technical Assistance; (9) BMP Effectiveness Monitoring.				
Measures of Success:	<ul style="list-style-type: none"> • Custom manure/compost haulers will have an enhanced understanding of surface water quality issues related to manure/compost application, to include bacteria and nutrients. • Custom manure/compost haulers will have an enhanced understanding of manure application best management practices. • Operators of manure/compost spreaders will understand the methodologies for field calibration of manure/compost spreading equipment. • Materials and trainings available in English and Spanish. 				
Project Type:	Implementation (); Education (X); Planning (); Assessment (); Groundwater ()				
Status of Water Body: 2008 Texas Water Quality Inventory and 303(d) List	<u>Segment ID:</u> 0207A – Buck Creek	<u>Parameter:</u> Bacteria Nitrate	<u>Category:</u> 5c concern	0299A – Sweetwater Creek Bacteria 5c	
Project Location (Statewide or Watershed and County)	Sweetwater Creek Watershed in Gray and Wheeler counties and Buck Creek Watershed in Childress, Collingsworth and Donley counties, in the Texas High Plains				
Key Project Activities:	Hire Staff (X); Surface Water Quality Monitoring (); Technical Assistance (X); Education (X); Implementation (); BMP Effectiveness Monitoring (X); Demonstration (X); Planning (); Modeling (); Bacterial Source Tracking (); Other ()				
Texas NPS Management Program Elements:	<ul style="list-style-type: none"> • LTG Objectives 1, 2 and 5 • STG 1, Objective 5; STG 2, Objective 2; and STG 3, Objective 1 and 6 				
Project Costs:	Federal:	\$326,011	Non-Federal:	\$200,198	Total: \$526,209
Project Management:	<ul style="list-style-type: none"> • Texas Cattle Feeders Association • Texas AgriLife Extension Service at Amarillo • Texas AgriLife Research at Vernon • West Texas A&M University 				
Project Period:	September 1, 2009 – August 31, 2012				

Part I – Applicant Information

Applicant							
Project Lead		Benjamin T. Weinheimer, Sr., P.E.					
Title		Vice President					
Organization		Texas Cattle Feeders Association					
E-mail Address		ben@tcfa.org					
Street Address		5501 I-40 West					
City	Amarillo	County	Potter	State	TX	Zip Code	79106
Telephone Number		(806) 358-3681		Fax Number		(806) 352-6026	

Project Partners	
Names	Roles & Responsibilities
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects.
Texas Cattle Feeders Association (TCFA)	Serve as lead for the project, including administration, staff management, completion and filing of reports, scheduling and organization of meetings, workshops, seminars and field days.
Texas AgriLife Extension Service at Amarillo (Brent Auvermann, Ph.D) (AgriLife Extension)	Provide technical expertise for development of educational materials, develop Quality Assurance Project Plan (QAPP) for monitoring elements, assist with educational objectives and tasks and facilitate landowner cooperator contacts.
Texas AgriLife Research at Vernon (Paul DeLaune, Ph.D) (AgriLife Research)	Serve as liaison to the Buck Creek Watershed Protection Plan project team, facilitate stakeholder involvement and site cooperators
West Texas A&M University (David Parker, Ph.D) (WTAMU)	Provide access to a modern manure spreader and a qualified operator for field days and training events.

Part II – Project Information

Project Type							
Surface Water	<input checked="" type="checkbox"/>	Groundwater	<input type="checkbox"/>				
Does the project implement recommendations made in a completed Watershed Protection Plan or an adopted TMDL or Implementation Plan?				Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
If yes, identify the document.							
If yes, identify the agency/group that developed and/or approved the document.				Year Developed			

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305 Category (b)	Size (Acres)
Sweetwater Creek	11120302	0299A	5c	183,680
Buck Creek	11120105	0207A	5c	145,169

Water Quality Impairment
<p>Describe all known causes (pollutants of concern) of water quality impairments from any of the following sources: 2008 Texas Water Quality Inventory and 303(d) List, Clean Rivers Program Basin Summary, Basin Highlights Reports or Other Documented Sources.</p> <p><u>2008 Texas Water Quality Inventory and 303(d) List</u></p> <p>Sweetwater Creek: From the Oklahoma State Line in Wheeler County to the upstream perennial portion of the stream northwest of Wheeler in Wheeler County (tributary of North Fork Red River). Sweetwater Creek was first listed on the Texas 303(d) List in 2002 for elevated bacteria. Although the specific sources are not known, possible sources of the bacteria include domesticated livestock or wildlife living in the watershed, carcasses, land application of manure/compost or effluent and on-site sewage facilities. Increased rainfall and run-off into the creek have likely increased the concentrations.</p> <p>Buck Creek: Buck Creek is a small tributary in the Red River Basin. Buck Creek joins the Lower Prairie Dog Town Fork of the Red River to form the Red River above Pease River. Buck Creek was first listed on the Texas 303(d) List in 2000 for elevated bacteria. The sources of bacteria are still under investigation through TSSWCB project 06-11 <i>Watershed Protection Plan Development for Buck Creek</i>. Nitrates are also an identified parameter of concern in Buck Creek.</p>

Project Narrative

Problem/Need Statement

The land application of manure/compost is a viable organic nutrient option for crop production across the Texas High Plains. Within 150 mile radius of Amarillo, 5.8 million head of beef cattle are fed in feedyards; this is about 30% of the nation's fed cattle production. The cattle feeding industry has served as an important economic driver in this region since the 1960s. Manure has been primarily used as a nutrient and soil amendment on cropland. Primary crops in the region include corn, wheat, cotton, alfalfa, peanuts, grain sorghum and hay.

The movement of manure/compost to cropland is typically a three-way relationship consisting of a crop producer, a feedyard source of manure/compost and a third-party custom hauler/applicator. Over the past five decades, custom manure and compost companies have become an important component in the operation of feedyards and farms that purchase manure or compost. Application rates are determined by the crops to be grown, residual nutrients and the soil recommendations of crop advisors and soil testing laboratories at land grant universities. Manure and compost companies generally have a fixed rate for loading and spreading (i.e., \$3.50 per ton) and a hauling charge (i.e., \$0.25 per ton per mile). The cost of manure/compost to the crop producer serves as an important self-limiting tool to prevent the over-application of nutrients.

Manure and compost companies have strived over the years to provide a service to both feedyards and crop producers in the most cost-effective manner possible. Unfortunately, little attention to the environmental impacts has been paid by this important segment of the cattle feeding industry. This project, through training and demonstrations, will establish a program to provide for long-term implementation of best management practices (BMP) to be utilized during the land application of manure or compost. A comprehensive environmental training program using printed materials, videos and web-based materials (in both English and Spanish) will heighten the environmental awareness of custom manure and compost owners and their employees. In addition, crop producers will benefit by participating in the workshops, field days and seminar and will have greater assurance that using manure or compost in their nutrient management programs has tremendous benefits and can be accomplished in a manner that is protective of the environment, including water quality.

In the 2000 and 2002 Texas 303(d) Lists, two watersheds in the Texas High Plains were identified as impaired based on elevated bacteria levels in the creeks (Sweetwater Creek and Buck Creek). These creeks continue to be listed on the 2008 Texas 303(d) List. The source of the bacteria is not yet know and, at least for Buck Creek, is currently being investigated through TSSWCB project 06-11 *Watershed Protection Plan Development for Buck Creek*. These two watersheds will be used as pilot watersheds for the "beta-testing" of the environmental training curriculum to be developed through this project. A targeted educational program to assist manure and compost applicators will increase understanding appropriate BMPs will complement any watershed protection plan measures that are developed.

In addition to the watersheds identified above, all manure/compost haulers and crop producers in the Texas High Plains will benefit from this training and demonstration project. A benefit will also be provided to feedyard owners and operators that produce crops on land owned or operated by the feedyard. While the land under the control of the feedyard is typically covered under the facility's concentrated animal feeding operation (CAFO) permit, manure may be applied to that land by a custom manure/compost hauler.

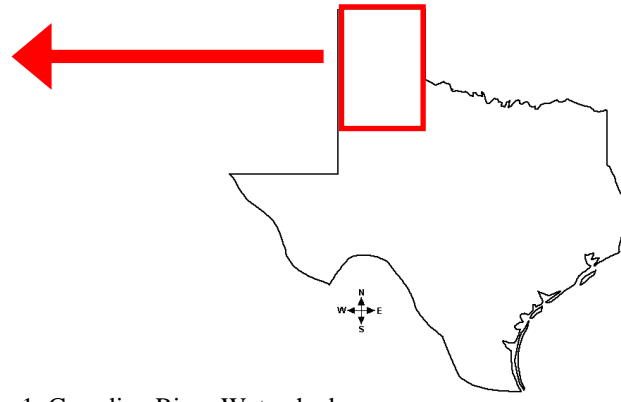
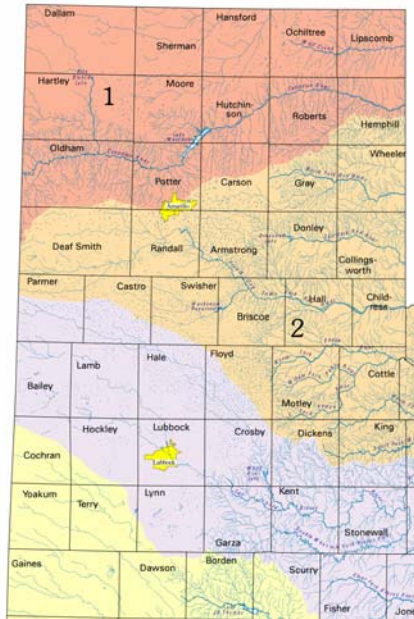
This project will be the first of its kind that targets a diverse group of stakeholders and is specific to the independent business relationship (feedyards, manure/compost haulers, certified crop advisors and crop producers) and cropping systems that are implemented in the Texas High Plains. TCFA is uniquely situated to facilitate the development and implementation of this environmental training curriculum. TCFA represents the cattle feeding industry in Texas, Oklahoma and New Mexico and has nearly 200 Feedyard Members with a total membership around 5,000. As a result, this environmental training program has the potential, if successful in Texas, to expand to Oklahoma and New Mexico.

Project Narrative

General Project Description (Include Project Location Map)

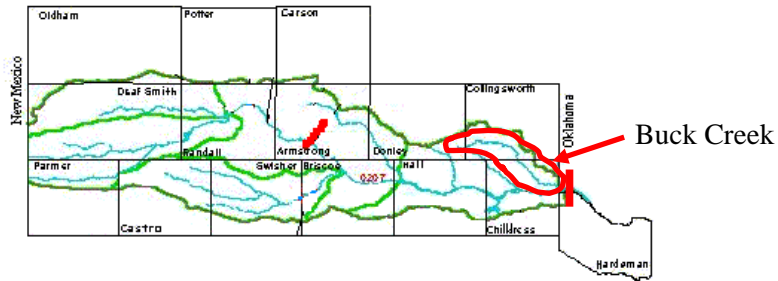
The primary focus of this project is to facilitate the development and implementation of an education, training, and demonstration program to improve the understanding of environmental protection principles by manure/compost haulers, equipment operators, certified crop advisors (CCAs), and crop producers. The project will focus on two specific areas and the area generally described as the Texas High Plains – the Amarillo and Lubbock regions of Texas:

Texas High Plains:

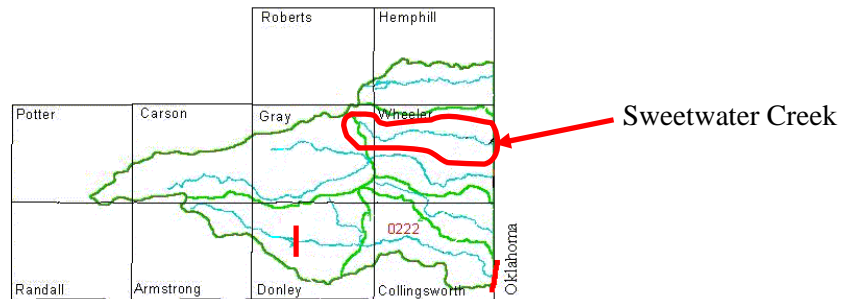


- 1. Canadian River Watershed
- 2. Red River Watershed

Buck Creek Watershed (0207A):



Sweetwater Creek Watershed (0299A):



The project will design and develop an environmental training curriculum, in both English and Spanish, tailored to the current business relationship that exists between feedyard, manure/compost companies and crop producers. The curriculum will outline key concepts for environmental management and water quality protection. A survey will be developed and administered at the initiation of the project to assess the current level of environmental knowledge of custom manure/compost haulers and the extent of training provided to equipment operators. A summary of the survey results will be used as guidance for the curriculum. Also, a project advisory group will be organized, consisting of CAFO operators, manure and compost haulers, livestock industry organizations (i.e., Texas Farm Bureau (TFB), Texas Association of Dairymen (TAD), Texas and Southwestern Cattle Raisers Association (TSCRA), commodity organizations (i.e., Corn Producers Association of Texas, Plains Cotton Growers, Texas Grain Sorghum Producers Board), AgriLife Extension, TSSWCB, SWCDs, Texas Department of Agriculture (TDA), U.S. Department of Agriculture- Natural Resources Conservation Service (USDA-NRCS), CCAs and crop producers, stakeholders of the pilot watersheds (Buck Creek and Sweetwater Creek) and demonstration site cooperators, to design and develop the environmental training curriculum and prioritize the selection of project demonstration sites.

Three to four demonstration sites will be established to train custom manure hauler owners, equipment operators, certified crop advisors and crop producers on the principles of environmental management for land application of manure. A variety of BMPs are available to consider when applying manure and compost to the land. BMP recommendations will be compiled and discussed with manure/compost company owners and equipment operators at project field days workshops. All educational materials will be made available through websites.

The project will notify custom manure haulers of the availability of on-site technical assistance and field training for owners and operators, and encourage implementation of USDA-NRCS conservation practices by landowners through the Environmental Quality Incentives Program (EQIP). In addition, TCFA, with assistance from local SWCDs and the TSSWCB Hale Center Regional Office, will promote the availability of technical assistance and encourage the development and implementation of TSSWCB-certified Water Quality Management Plans (WQMPs). A WQMP is a site-specific plan developed through and approved by SWCDs which includes appropriate land treatment practices, production practices, management measures, and technologies that prevent and abate agricultural and silvicultural nonpoint source pollution. TCFA and AgriLife Extension will explore options for future development of a certification program for manure and compost haulers based on the outcomes of the training and demonstration efforts of this project.

Tasks, Objectives and Schedules					
Task 1:	Project Administration				
Costs:	Federal:	\$33,723	Non-Federal:	\$37,425	Total: \$71,148
Objective:	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.				
Subtask 1.1:	TCFA/ AgriLife Extension 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 th of January, April, July and October. QPRs shall be distributed to all project partners.				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.2:	TCFA will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.3:	TCFA/ AgriLife Extension will attend and participate in public meetings, such as watershed stakeholder meetings, Clean Rivers Program meetings, and Soil and Water Conservation District (SWCD) meetings, in order to communicate project goals, activities and accomplishments to affected parties.				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.4:	TCFA/ AgriLife Extension will host coordination meetings through video conferencing or other means with TSSWCB, project partners, and any subcontractors, as appropriate, at least quarterly in the first year to discuss project activities, project schedule, communication needs, deliverables and other requirements. Meetings will be held as needed in the second and third year of the project.				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.5:	TCFA/ AgriLife Extension will develop and disseminate project informational materials, including, but not limited to, flyers, brochures, letters, news releases, and other appropriate promotional publications. As appropriate, TCFA will include information about the project in the TCFA <i>e-Newsletter</i> , in TCFA membership mailings, at the TCFA Annual Convention, and at the Annual Meeting of Texas SWCD Directors (TSSWCB must approve all announcements, letters and publications prior to distribution).				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.6:	AgriLife Extension will develop (months 1-3), host and maintain (months 4-36) an internet webpage for the dissemination of project information.				
	Start Date:	Month 1		Completion Date:	Month 36
Subtask 1.7:	AgriLife Extension will hire a Project Manager to coordinate and manage the work of project partners and subcontractors, to facilitate the project advisory group, to assist with the environmental knowledge assessment, to lead the development of the environmental training curriculum, to lead program delivery, and to assist with BMP effectiveness monitoring.				
	Start Date:	Month 1		Completion Date:	Month 4
Subtask 1.8:	TCFA, in collaboration with project partners, will develop and submit a Final Report at the culmination of the project. This final report will document project performance related to each project goal and measure of success. A draft of this final report will be submitted to TSSWCB for review prior to completing the document.				
	Start Date:	Month 34		Completion Date:	Month 36
Deliverables	<ul style="list-style-type: none"> • Quarterly progress reports in electronic format • Final Report (Electronic copy and 3 hard copies) • Promotional materials, as developed and disseminated • Project webpage • Reimbursement Forms and necessary documentation in hard copy format 				

Tasks, Objectives and Schedules						
Task 2:	Quality Assurance					
Costs:	Federal:	\$8,853	Non-Federal:	\$3,917	Total:	\$12,770
Objective:	To develop data quality objectives (DQOs) and quality assurance/quality control (QA/QC) activities to ensure data of known and acceptable quality are generated through this project.					
Subtask 2.1:	AgriLife Extension / AgriLife Research will develop a QAPP for activities in Task 9 consistent with <i>EPA Requirements for Quality Assurance Project Plans (QA/R-5)</i> and the <i>TSSWCB Environmental Data Quality Management Plan</i> .					
	All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the <i>TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415)</i> and <i>Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416)</i> .					
	Start Date:	Month 1	Completion Date:	Month 6		
Subtask 2.2:	AgriLife Extension / AgriLife Research will submit revisions and necessary amendments to the QAPP as needed.					
	Start Date:	Month 7	Completion Date:	Month 36		
Deliverables	<ul style="list-style-type: none"> • QAPP approved by TSSWCB and EPA in both electronic and hard copy formats • Approved revisions and amendments to QAPP, as needed • Data of known and acceptable quality as reported through Task 9 					

Tasks, Objectives and Schedules						
Task 3:	Environmental Knowledge Assessment					
Costs:	Federal:	\$14,039	Non-Federal:	\$7,280	Total:	\$21,319
Objective:	To assess the current level of environmental knowledge of manure haulers and the extent of training provided to equipment operators.					
Subtask 3.1:	AgriLife Extension will prepare a survey instrument, as appropriate, to assess the current level of environmental understanding and employee training offered by manure/compost haulers.					
	Start Date:	Month 1	Completion Date:	Month 5		
Subtask 3.2:	AgriLife Extension will update existing lists of manure/compost haulers in the Texas High Plains and conduct a pre-survey by mail, phone or in person (if needed) with haulers.					
	Start Date:	Month 4	Completion Date:	Month 9		
Subtask 3.3:	AgriLife Extension will establish current state-of-knowledge by haulers for environmental management and training through compilation of pre-survey results and development of an interpretive summary.					
	Start Date:	Month 9	Completion Date:	Month 11		
Subtask 3.4:	AgriLife Extension will conduct a post-survey of manure/compost haulers to assess adoption and implementation of BMPs and employee/equipment operator training programs.					
	Start Date:	Month 32	Completion Date:	Month 36		
Deliverables	<ul style="list-style-type: none"> • Survey instrument(s) – electronic and/or hardcopy • Current list of manure/compost haulers in the Texas High Plains • Produce summary document of manure hauler surveys (pre- and post- project implementation) 					

Tasks, Objectives and Schedules					
Task 4:	Project Advisory Group				
Costs:	Federal:	\$33,978	Non-Federal:	\$34,929	Total: \$68,907
Objective:	To organize an advisory group to design and develop an environmental training curriculum for manure/compost haulers, equipment operators and crop producers.				
Subtask 4.1:	TCFA will meet with AgriLife Extension specialists and Extension agents in Potter, Lubbock and Wilbarger counties and USDA-NRCS Zone 1 personnel to brief them on the objectives of the project, to solicit nominations for the advisory group and to identify potential demonstration sites and potential crop producer collaborators.				
	Start Date:	Month 1	Completion Date:	Month 3	
Subtask 4.2:	TCFA will identify members for the project advisory group. The advisory group will, at a minimum, consist of CAFO operators, manure and compost haulers, livestock industry organizations (i.e., Texas Farm Bureau (TFB), Texas Association of Dairymen (TAD), Texas and Southwestern Cattle Raisers Association (TSCRA), commodity organizations (i.e., Corn Producers Association of Texas, Plains Cotton Growers, Texas Grain Sorghum Producers Board), AgriLife Extension, TSSWCB, SWCDs, Texas Department of Agriculture (TDA), U.S. Department of Agriculture- Natural Resources Conservation Service (USDA-NRCS), Certified Crop Advisors (CCAs) and crop producers, stakeholders of the pilot watersheds (Buck Creek and Sweetwater Creek) and demonstration site cooperators.				
	Start Date:	Month 1	Completion Date:	Month 6	
Subtask 4.3:	TCFA shall host meetings and/or conference calls of the project advisory group at least twice in the first year and annually thereafter.				
	Start Date:	Month 6	Completion Date:	Month 36	
Subtask 4.4:	The project advisory group will discuss and prioritize criteria for selection of demonstration sites and provide input on the evaluation of BMP effectiveness. BMPs for protection of wellheads and sensitive areas, type of manure/compost application equipment and measurements of compaction, nutrient stratification and nutrient availability in no-till vs. conventional tillage, nitrogen mineralization rates, and other demonstration concepts.				
	Start Date:	Month 6	Completion Date:	Month 12	
Subtask 4.5:	The project advisory group shall review project objectives, provide input on project activities, provide input into development of an environmental training curriculum for manure/compost haulers, program delivery, and CEU processes.				
	Start Date:	Month 11	Completion Date:	Month 16	
Deliverables	<ul style="list-style-type: none"> List of representatives requested to serve on project advisory group, updated as needed Project advisory group meeting notices, agendas, meeting summaries, meeting materials, and lists of attendees 				

Tasks, Objectives and Schedules						
Task 5:	Manure Spreader Calibration Kits					
Costs:	Federal:	\$30,414	Non-Federal:	\$14,188	Total:	\$44,602
Objective:	To promote adoption of proper calibration and application of compost/manure by manure haulers, equipment operators and crop producers through distribution of calibration kits and educational materials					
Subtask 5.1:	TCFA will identify options for field calibration of manure/compost spreader trucks. Options may include single-pass calibration using the calibration kits to be assembled in Subtask 5.2 and/or calibration using a whole-truck method (scale weights and area to which manure/compost has been applied).					
	Start Date:	Month 4		Completion Date:	Month 9	
Subtask 5.2:	TCFA will assemble manure/compost spreader truck calibration kits. Thirty kits to be assembled initially. Distribute one calibration kit to each manure/compost hauling company in Texas High Plains at no charge at public project events. Additional kits will be provided at a nominal charge.					
	Start Date:	Month 9		Completion Date:	Month 16	
Subtask 5.3:	AgriLife Extension will verify field-scale technique for whole-truck calibration. This method would serve as a complement to the single-pass calibration kits and would require gross wt., tare wt., effective spreader width and length of spreader travel.					
	Start Date:	Month 5		Completion Date:	Month 12	
Deliverables	<ul style="list-style-type: none"> • Manure/compost spreader calibration kits assembled and provided to haulers (one per company). • Template for field verification of whole-truck calibration. 					

Tasks, Objectives and Schedules						
Task 6:	Curriculum Development					
Costs:	Federal:	\$28,973	Non-Federal:	\$16,417	Total:	\$45,390
Objective:	Develop written materials, videos, PowerPoint presentations and web-based resources for use in trainings					
Subtask 6.1:	TCFA/ AgriLife Extension will produce educational materials, pamphlets and video (if appropriate) to provide for concise and accurate descriptions of manure calibration equipment options. Types of materials will be determined by the project advisory group (TSSWCB must approve all educational materials prior to distribution).					
	Start Date:	Month 13		Completion Date:	Month 36	
Subtask 6.2:	AgriLife Extension will deploy educational materials at a national scale through the Livestock and Poultry Environmental Learning Center and the Extension Community of Practice (www.extension.org).					
	Start Date:	Month 32		Completion Date:	Month 36	
Subtask 6.4:	AgriLife Extension will provide a template for field-level feedback from manure and compost haulers to verify implementation of single-pass and whole-truck methods.					
	Start Date:	Month 32		Completion Date:	Month 36	
Deliverables	<ul style="list-style-type: none"> • Educational materials (English and Spanish, if needed) on calibration of spreader trucks • Template to measure of implementation of calibration methods by manure and compost haulers. 					

Tasks, Objectives and Schedules					
Task 7:	Demonstration and Program Delivery				
Costs:	Federal:	\$39,461	Non-Federal:	\$40,976	Total: \$80,437
Objective:	Utilize group workshops, field days and hands-on demonstration of BMPs and ensure availability of education materials through websites.				
Subtask 7.1:	Select 3 to 4 demonstration sites based on the recommendations of the advisory group. Factors in selection of demonstration sites may include crop types, soil types, manure vs. compost, application rates, location of water wells, ability to sample down-gradient soils and date of previous manure/compost application, if any. At least 1 demonstration site will be selected within the Buck Creek Watershed and at least 1 demonstration site will be selected within the Sweetwater Creek Watershed.				
	Start Date:	Month 1		Completion Date:	Month 9
Subtask 7.2:	Train custom manure hauler owners, equipment operators, certified crop advisors and crop producers on the principles of environmental management for land application of manure.				
	Start Date:	Month 14		Completion Date:	Month 36
Subtask 7.3:	TCFA/ AgriLife Extension will host field days at each demonstration site at least once in Year 2 and once in Year 3.				
	Start Date:	Month 13		Completion Date:	Month 36
Subtask 7.4:	TCFA will organize, in conjunction with all project partners, six seminars/workshops across the Texas High Plains for program delivery in Year 3.				
	Start Date:	Month 13		Completion Date:	Month 36
Subtask 7.5:	TCFA will provide project results to state livestock organizations in Oklahoma, New Mexico, Kansas, Colorado and Nebraska.				
	Start Date:	Month 32		Completion Date:	Month 36
Subtask 7.6:	TCFA will present results of the project to the Property Rights and Environmental Management Committee at a National Cattlemen’s Beef Association Annual Convention.				
	Start Date:	Month 29		Completion Date:	Month 30
Deliverables	<ul style="list-style-type: none"> Establish demonstration sites for manure/compost best management practices. Conduct field days, workshops or seminars in the Texas High Plains, Sweetwater Creek & Buck Creek watersheds 				

Tasks, Objectives and Schedules						
Task 8:	Technical Assistance					
Costs:	Federal:	\$12,343	Non-Federal:	\$7,998	Total:	\$20,341
Objective:	Utilize group workshops, field days and hands-on demonstration of BMPs and ensure availability of education materials through websites. Notify custom manure haulers of the availability of on-site technical assistance and field training for owners and operators, and encourage implementation of USDA-NRCS conservation practices by landowners through the Environmental Quality Incentives Program (EQIP)					
Subtask 8.1:	AgriLife Extension will establish a system of tracking and providing notifications on the availability of technical and financial assistance (i.e., mail, email, website subscription) to custom manure and compost haulers in the Texas High Plains region.					
	Start Date:	Month 8	Completion Date:	Month 12		
Subtask 8.2:	TCFA/ AgriLife Extension will encourage manure and compost hauler owners and equipment operators to attend group workshops, field days and seminars. Also, offer to provide additional hands-on, in-the-field training upon request.					
	Start Date:	Month 13	Completion Date:	Month 36		
Subtask 8.3:	<p>TCFA, with assistance from local SWCDs, USDA-NRCS and the TSSWCB Hale Center Regional Office, will promote the availability of technical assistance and encourage adoption and implementation of USDA- NRCS conservation practices (or best management practices (BMPs)), described in the USDA-NRCS Field Office Technical Guide (FOTG) as effective at mitigating the environmental impact of manure/compost application.</p> <p>TCFA, with assistance from local SWCDs and the TSSWCB Hale Center Regional Office, will promote the availability of technical assistance and encourage the development and implementation of TSSWCB-certified Water Quality Management Plans (WQMPs). A WQMP is a site-specific plan developed through and approved by SWCDs which includes appropriate land treatment practices, production practices, management measures, and technologies that prevent and abate agricultural and silvicultural nonpoint source pollution. The BMPs prescribed in a WQMP are defined in the NRCS FOTG. WQMPs afford agricultural producers an opportunity to comply with state water quality laws through traditional voluntary incentive-based programs.</p> <p>TCFA, with assistance from local SWCDs and USDA-NRCS, will promote availability and utilization of cost-share funds through the EQIP State Resource Concern for AFO-CAFO Beef – Water Quality/Air Quality to aid in implementation of BMPs related to manure/compost application.</p> <p>TCFA, with assistance from local SWCDs and the TSSWCB Hale Center Regional Office, will promote availability and utilization of cost-share funds through the WQMP Program (historically known as 503 cost-share) to aid in implementation of BMPs related to manure/compost application.</p>					
	Start Date:	Month 13	Completion Date:	Month 36		
Subtask 8.4:	TCFA/ AgriLife Extension will explore options for future development of a certification program for manure and compost haulers based on the outcomes of the training and demonstration efforts of this project.					
	Start Date:	Month 32	Completion Date:	Month 36		
Deliverables	<ul style="list-style-type: none"> • Maintain a list of custom manure and compost hauling companies in the Texas High Plains, updated as needed • Offer to individual manure and/or compost hauling companies, upon request, edge-of-field trainings and demonstration of manure/compost application BMPs • Prepare and publish a list of BMPs for manure/compost application • Identify BMPs that are eligible for financial assistance (TSSWCB WQMP or USDA-NRCS EQIP) 					

Tasks, Objectives and Schedules					
Task 9:	BMP Effectiveness Monitoring				
Costs:	Federal:	\$124,227	Non-Federal:	\$37,068	Total: \$161,295
Objective:	Monitor implementation of manure/compost BMPs through collection of water runoff using automatic water samplers, soil samples within fields, soil samples within buffer zones, down-gradient soil samples, manure samples and water well samples.				
Subtask 9.1:	TCFA/ AgriLife Extension and AgriLife Research, as appropriate, will establish control and treatment plots at one location in the Sweetwater Creek watershed, one location in the Buck Creek watershed and one location on the Caprock. Treatments may include application of manure and/or compost at single-year vs. multi-year agronomic rates.				
	Start Date:	Month 6	Completion Date:	Month 9	
Subtask 9.2:	At one demonstration location, AgriLife Research will install automatic water samplers to collect runoff from the control and treatment plots. Water samples will be analyzed for nutrients and bacteria by the Texas AgriLife Research Laboratory at Vernon.				
	Start Date:	Month 6	Completion Date:	Month 9	
Subtask 9.3:	At least annually, TCFA will collect soil samples from control and treatment plots using GPS grid soil sampling. Samples will be collected at the 0-6 inch depth and 6-24 inch depth across the grid. Composite samples will be submitted to a commercial soil testing laboratory for macronutrient, micronutrient, pH and organic matter. In a similar manner, soil samples will be collected at two distances down-gradient of the plots. Distances will be determined by site-specific topographic features of the site locations.				
	Start Date:	Month 6	Completion Date:	Month 36	
Subtask 9.4:	Water samples will be collected by TCFA from all water wells located within the boundaries of the control and treatment plots as well as any water wells (where access is granted) within 500 feet down-gradient of the plot locations. Water samples will be analyzed for bacteria and nutrients.				
	Start Date:	Month 6	Completion Date:	Month 36	
Subtask 9.5:	TCFA will collect representative manure and/or compost samples prior to all planned land application events. Samples will be analyzed by a commercial testing laboratory for macronutrients, micro nutrients and moisture content. Split samples will also be provided to AgriLife Research for the BST library.				
	Start Date:	Month 6	Completion Date:	Month 36	
Deliverables	<ul style="list-style-type: none"> • Technical Report on effectiveness of BMPs with site-by-site case study journal. • Database of field-level measurements associated with implementation of BMPs. 				

Project Goals (Expand from NPS Summary Page)

To facilitate the development and implementation of an education, training and demonstration program to improve the understanding of environmental protection principles by manure/compost haulers, equipment operators, CCAs and crop producers.

- Assess the current level of environmental knowledge of custom manure/compost haulers and the extent of training provided to equipment operators.
 - To establish a solid foundation for this project, a survey instrument will be developed by AgriLife Extension and TCFA.
 - Manure and compost company representatives will be given the option of completing the survey in writing or via a phone conversation with project personnel.
 - A summary of the survey results will be used as guidance for the second objective below.
 - A post-project survey will also be conducted to measure levels of implementation.
- Design and develop an environmental training curriculum for custom manure/compost hauler owners, equipment operators, CCAs and crop producers, including materials in Spanish.
 - Project will develop a training curriculum tailored to the current business relationship that exists between feedyard, manure/compost companies and crop producers.
 - For the first time, equipment operators will have access to concise and specific information, in English and Spanish, outlining the key concepts for environmental management and water quality protection.
- Promote adoption of sound water quality protection practices by custom manure/compost haulers, equipment operators and crop producers.
 - There are a variety of BMPs to consider when applying manure and compost to the land. BMP recommendations will be compiled and discussed with manure/compost company owners and equipment operators.
 - Practices eligible for financial assistance.
 - Different considerations, where appropriate, for compost vs. manure will be identified.
- Utilize workshops, field days and hands-on demonstration of best management practices and ensure availability of education materials through website.
 - The internet contains an extensive volume of information on manure and compost. Unfortunately, the credibility and source of the information is not always known. In addition, the time required for a manure/compost company owner or employee to decipher the information can be excessive.
 - Hands-on training and demonstration of BMPs, in conjunction with field-collected data, will be used to develop a strong and successful education program.

Measures of Success (Expand from NPS Summary Page)

- Custom manure/compost haulers will have an enhanced understanding of bacteria concerns and issues.
 - Owner and employee/equipment operator training will be implemented for proper application of manure/compost, including measures to protect water quality.
- Custom manure/compost haulers will have an enhanced understanding of manure application best management practices.
 - Surveys of manure/compost haulers will be conducted at the start of the project and again at the end of the project to measure the change in practices implemented and adoption of employee training programs.
- Operators of manure/compost spreaders will understand the methodologies for field calibration of manure/compost spreading equipment.
 - Calibration kits will be assembled and distributed to manure and compost hauling companies.
 - Training/demonstration of spreader calibration provided to owners/operators will be documented.
- Materials and trainings will be available in English and Spanish.
 - Printed training materials, videos and web-based resources will be available for English and Spanish speaking owners and employees.

2005 Texas Nonpoint Source Management Program Reference (Expand from NPS Summary Page)
Goals and/or Milestone(s)
<ul style="list-style-type: none"> • Long Term Goal – Objective 1 - Focus NPS abatement efforts, implementation strategies, and available resources in watersheds identified as impacted by nonpoint source pollution.
<ul style="list-style-type: none"> • Long Term Goal – Objective 2 - Support the implementation of state, regional, and local programs to prevent nonpoint source pollution through assessment, implementation, and education.
<ul style="list-style-type: none"> • Long Term Goal – Objective 5 - Develop partnerships, relationships, memoranda of agreement, and other instruments to facilitate collective, cooperative approaches to manage NPS pollution.
<ul style="list-style-type: none"> • Short Term Goal 1 – Objective 5 – Conduct monitoring to determine effectiveness of BMP implementation.
<ul style="list-style-type: none"> • Short Term Goal 2 – Objective 2 - Develop and implement BMPs to address constituents of concern or water bodies not meeting water quality standards in watersheds identified as impacted by NPS pollution.
<ul style="list-style-type: none"> • Short Term Goal 3 – Objective 1 - Enhance existing outreach programs at the state, regional, and local levels to maximize the effectiveness of NPS education.
<ul style="list-style-type: none"> • Short Term Goal 3 – Objective 6 – Implement public outreach and education to maintain and restore water quality in waterbodies impacted by nonpoint source pollution.