NONPOINT SOURCE SUMMARY PAGE

FY 04 CWA 319(h)

1. TITLE OF PROJECT: Seymour Aquifer Water Quality Improvement Project

2. PROJECT GOALS/OBJECTIVES: This project will provide irrigators in Haskell, Knox, and Jones counties with an opportunity to participate in water quality educational activities, technical assistance, and financial assistance for the implementation of Best Management Practices (BMPs), in order to improve water quality in the Seymour Aquifer. The main goal of this project is to reduce the nitrate levels in the Seymour Aquifer.

3. PROJECT TASKS: (1) To provide irrigators with water quality educational opportunities which pertain to the reduction of nitrate levels in the Seymour Aquifer. (2) To provide irrigators with technical and financial assistance to aid in the development and implementation of Water Quality Management Plans (WQMPs) to reduce nitrate levels in the Seymour Aquifer. (3) To compile information on the number, types, and locations of BMPs implemented. (4) To assess the effectiveness of WQMP implementation.

4. MEASURES OF SUCCESS: (1) Demonstrate benefits of conversion to drip irrigation through implementation of approximately 15 WQMPs in the Haskell, Wichita Brazos, and California Creek SWCDs. (2) Conduct 5 education programs for local irrigators during the course of the project to increase producer awareness and use of irrigation and nutrient BMPs. (3) Estimate of reductions in nitrate concentrations in the Seymour Aquifer and analysis of additional measures needed to achieve water quality standards.

5. PROJECT TYPE: Statewide ( ) Watershed ( ) Demonstration ( ) Other (X)

6. WATERBODY TYPE: River ( ) Lake ( ) Wetland ( ) Ground Water (X) Other ( )

7. PROJECT LOCATION: Seymour Aquifer – Haskell, Knox, and Jones counties

8. NPS MANAGEMENT PROGRAM REFERENCE: State of Texas Agricultural/Silvicultural Nonpoint Source Management Program – Approved February 15, 2000.

9. NPS ASSESSMENT REPORT STATUS: Impaired ( ) Impacted (X) Threatened ( )

10. KEY PROJECT ACTIVITIES: Hire Staff (X) Monitoring (X) Technical Assistance (X) Education (X) BMP Implementation (X) Demonstration Project ( ) Other ( )

11. NPS MANAGEMENT PROGRAM ELEMENTS: Implementing Milestones from the *1999 Texas Nonpoint Source Pollution Assessment Report and Management Program* including (1) providing financial assistance to Soil and Water Conservation Districts (SWCDs) for the implementation of Water Quality Management Plans in order to reduce NPS pollution, (2) coordinating with Federal, State, and Local Programs, and (3) technology transfer, technical support, administrative support and cooperation between agencies and programs for the prevention of NPS pollution.

12. PROJECT COSTS: Federal: ($764,054) Local Match: ($399,439) Total Project: ($1,163,493)

13. PROJECT MANAGEMENT: Texas State Soil and Water Conservation Board

14. PROJECT PERIOD: Three years from start date.

Seymour Aquifer Water Quality Improvement Project

FY04 CWA Section 319(h)

WORKPLAN

Problem Need/Statement

The Seymour Aquifer is a shallow aquifer in Northwest Central Texas and the only major source of groundwater in Haskell, Jones, and Knox Counties. The aquifer underlies over 300,000 acres and furnishes drinking and domestic water for many rural families. In addition, over 3,000 wells furnish water for irrigation and livestock use. The State of Texas has identified elevated nitrate levels as a concern in Haskell, Knox, and Jones Counties. In over 75% of the wells tested, nitrate levels exceed the federal safe drinking water standard of 10 mg/L NO3-N. Nitrate levels have been documented in some wells as high as 35 mg/L NO3-N. To remove this threat, the Texas State Soil and Water Conservation Board (TSSWCB) will work cooperatively with the Haskell, Wichita Brazos, and California Creek Soil and Water Conservation Districts (SWCDs), Natural Resources Conservation Service (NRCS), Texas Cooperative Extension (TCE), Rolling Plains Groundwater Conservation District, Lower Seymour Groundwater Conservation District, and Texas Agricultural Experiment Station (TAES) to provide water quality education, technical assistance, and financial assistance to irrigators for BMP implementation in order to reduce nitrate concentrations in the Seymour Aquifer.

General Project Description

This program will serve as a catalyst to encourage the installation of Trickle (Drip) Irrigation Systems as a best management practice to improve water quality and increase water quantity in the Seymour Aquifer. Installation of Trickle (Drip) Irrigation Systems costs in excess of $1,000 per acre. The proposed project would provide cost-share to replace existing center pivot, sprinkler, or row-water irrigation systems with drip irrigation systems at a cost-share rate of 60 percent. The project area will include the irrigated portions of Haskell, Knox, and Jones counties.

The installation of drip irrigation systems will have a direct impact on the area groundwater by:

1) Reducing the potential for return flow of irrigation water into the aquifer (Return irrigation water flow has the potential to transport nutrients and pesticides into groundwater).

2) Increasing irrigation efficiency of row, center pivot, and center pivot systems therefore increasing water quantity.

Participating irrigators must develop a TSSWCB-certified WQMP in order to receive cost share. In this project, a technician will be employed by the Haskell SWCD, to assist landowners in the development, implementation, and/or maintenance of WQMPs. Assistance will be provided to the technician, when needed, by the TSSWCB Dublin Regional Office and NRCS. The technician will work in the adjacent Wichita Brazos and California Creek SWCDs through cooperative agreements between the participating SWCDs.

WQMPs insure farming operations are carried out in a manner consistent with state water quality standards. The TSSWCB will review all of the WQMPs to make certain they are consistent with the state water quality standards and certify those WQMPs that meet the necessary criteria. The objective of WQMP implementation is to achieve a level of pollution prevention or abatement determined to be consistent with State water quality standards.

A number of BMPs to reduce nitrate levels may be implemented through the development of WQMPs. However, only implementation of Trickle (Drip) Irrigation Systems will receive cost-share. Examples of other BMPs that may be included in WQMPs are:

- Irrigation management
- Nutrient management
- Integrated pest management (e.g., sprayer calibration, incorporation banding, follow label)
- Conservation tillage

Highest priority is given to the replacement of the least efficient irrigation systems. Feasibility of successful installation will also be considered. The Haskell, Wichita Brazos, and California Creek SWCDs, with assistance from the TSSWCB and NRCS, will prioritize the applications received and determine which landowners in their respective SWCDs will receive technical assistance for the development and implementation of WQMPs.

In summary, the following are actions that will be undertaken by this project to reduce the potential for nitrate infiltration into the Seymour Aquifer:

- Provide technical assistance to irrigators concerning the implementation of appropriate BMPs to aid in the reduction of nitrate infiltration.
- Provide three educational events describing methods for the reduction of nitrate infiltration.
- Provide financial assistance to irrigators for the implementation of BMPs in order to aid in the reduction of nitrate infiltration.
- The TAES, in coordination with the Rolling Plains Groundwater Conservation District and Lower Seymour Groundwater Conservation District will evaluate the effectiveness of BMP implementation in reducing nitrate levels within the aquifer.

It is hoped that the evaluation of the BMP and local interest resulting from implementation of this demonstration will encourage the establishment of an EQIP priority area for the Seymour to encourage further implementation of this BMP throughout the aquifer.

Tasks, Objectives, Schedules, and Estimated Costs

Task 1: Program Coordination and Management

Costs: $171,410 (Federal), $0 (State), $171,410 (Total)

Objective: Organize an integrated team among the multiple agencies and groups involved with the project to efficiently and effectively achieve project goals.

Subtask 1.1: The Haskell SWCD will hire a technician to coordinate project activities and provide technical assistance to irrigators through the development of WQMPs (Month 1 to month 6)

Subtask 1.2: The technician will attend monthly SWCD board meetings to discuss technical assistance activities, project schedule, lines of responsibility, communication needs, and other required tasks with project participants. (Month 1 through month 36)

Subtask 1.3: The technician will attend Rolling Plains Groundwater Conservation District and Lower Seymour Groundwater Conservation District meetings to offer input on efforts in reducing nitrate levels in the Seymour Aquifer. (Month 1 to Month 36)

Subtask 1.4: The technician will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc. (Month 1 to Month 36)

Subtask 1.5 The technician, with help from other entities involved in the project, will complete and submit quarterly reports to the TSSWCB project manager. Quarterly reports are due January 15, April 15, July 15, and October 15 of each year. (Month 1 to Month 36)

Subtask 1.6 The technician, with help from other entities involved in the project, will complete and submit a final report to the TSSWCB at the culmination of the project. This report will be completed and provided to the TSSWCB in electronic format (i.e. compact disc; etc.). (Month 36)

Subtask 1.7 The technician, as appropriate, will assist with educational activities and evaluation of BMPs.

Deliverables

- Quarterly reports documenting project status.
- Copies of agendas, attendance, handout information, and minutes from meetings.
- Final report.

Task 2: Development and Implementation of WQMPs

Costs: $412,300 (Federal), $274,866 (State), $687,166 (Total)

Objective: Encourage irrigators to implement Trickle (Drip) Irrigation Systems and other BMPs to reduce nitrate infiltration through a traditional voluntary based incentive program and assistance to producers in developing and implementing WQMPs.

Subtask 2.1: The Haskell, Wichita Brazos, and California Creek SWCDs will each be allocated $150,000 to provide cost-share to irrigators for conversion of existing irrigation systems to Trickle (Drip) Irrigation Systems. The maximum cost-share rate shall not exceed 60 percent of the cost of the Trickle Irrigation System. Irrigators shall be eligible to receive a maximum cost-share amount of $30,000. Cost share will be based on actual cost not to exceed average cost of the practice (Month 1).

Subtask 2.2: The Haskell, Wichita Brazos, and California Creek SWCDs, with assistance from NRCS, will send out notifications announcing the availability of assistance for implementing WQMPs/BMPs and prioritize the WQMP applications received. (Month 1 to Month 3)

Subtask 2.3: The technician will provide landowners information on appropriate BMPs and will work with the TSSWCB Dublin Regional Office in developing and implementing WQMPs. (Month 1 to Month 36)

Subtask 2.4: The technician will develop a minimum of 15 WQMPs. The SWCD technician will complete all WQMPs with assistance from the NRCS and the TSSWCB Dublin Regional Office as needed. (Month 1 to Month 36)

Subtask 2.5: TSSWCB will provide technical review and certification of WQMPs. During this process, TSSWCB will certify all WQMPs and ensure that they are consistent with state water quality standards (Month 1 to Month 36)

Subtask 2.6: The SWCD technician will create a map showing the location of all WQMPs/BMPs implemented and developed within the SWCDs throughout the project. This map will not reveal the identity or exact location of any producer due to the confidentiality of WQMPs. (Month 1 to Month 36).

Subtask 2.7: The SWCD technician will conduct annual status reviews on all WQMPs developed to ensure that the implementation schedule is followed and funds are properly administered. After the project ends, annual status reviews will continue to be conducted by the TSSWCB Dublin Regional Office on 10% of the WQMPs each year. (Month 1 to Month 36)

Subtask 2.8: The NRCS will provide the needed training for the technician with assistance from the TSSWCB. (Month 1 to Month 36)

Deliverables:

- 15 WQMPs developed and implemented within the Haskell, Wichita Brazos, and California Creek SWCDs.
- Map of project area and BMPs implemented with a quantifiable breakdown for each Best Management Practice.

- Annual status reviews will be submitted to the TSSWCB

Task 3: Water Quality Education of Best Management Practices to Reduce Nitrate Infiltration

Costs: $18,480 (Federal), $12,320 (State), $ 30,800 (Total)

Objective: In order to promote the implementation of cost effective BMPs that reduce nitrate infiltration, information will be provided to irrigators in the Haskell, Wichita Brazos, and California Creek SWCDs about how their operation may affect water quality and quantity in the Seymour Aquifer. This information will be disseminated through the SWCD technician and TCE in cooperation with the TWRI, TAES, TSSWCB, NRCS, and Groundwater Districts.

Subtask 3.1: TCE and TAES will assimilate and evaluate the adequacy of existing educational resources and resource needs to provide educational support for the project. (Month 1 through month 12)

Subtask 3.2: TCE, TAES and TWRI will provide 3 educational/training events on single- or multi-county level to improve grower knowledge and understanding of BMPs for nutrient and irrigation management. TSSWCB personnel and other agency personnel including Haskell, Wichita Brazos, and California Creek SWCDs, will be speakers to provide information on cost share and technical assistance programs available to assist producers. (Month 1 through month 12)

Subtask 3.3: TCE, TAES and TWRI will hold single follow-up meetings during subsequent project years 2 and 3 to provide information on project activities or results and provide additional training of implementing and sustaining BMPs as necessary. (Month 12 through Month 36)

Subtask 3.4: TCE and TAES will conduct a preliminary survey of a select group of initial event participants to evaluate knowledge about ground water conditions in the aquifer and assess current knowledge and use of practices in irrigation and nutrient management. Follow-up surveys will be conducted in subsequent years to evaluate changes, if any, in producer awareness and in irrigation and nutrient BMPs. (Month 1 through month 36)

Deliverables:

- Compilation of existing and developed resources in irrigation and nutrient management
- Conduct a minimum of 5 training and workshops. Provide schedules, agendas and participant lists
- Completion of annual producer surveys. Provide results

Task 4: Evaluation of BMP Effectiveness

Costs: $ 161,864 (Federal), $ 112,253 (State), $ 274,117 (Total)

Objective: Quantify and verify the effectiveness of BMP implementation in reducing nitrate levels within the aquifer.

Subtask 4.1: As appropriate, the TAES, with assistance from the SWCD technician, will assess and compile existing data on the Seymour Aquifer and the effects of irrigation and other farming practices on aquifer water quality (Month 1 through month 36)

Subtask 4.2: TAES will assess impacts of conversion from furrow irrigation to drip irrigation on nitrate concentration and water quantity at field scale by continuing projects on established drip and furrow irrigation plots located in aquifer region to further validate current data, adding the following: install in-line flow meters to quantify water use in furrow irrigation and monitor nitrates in irrigation water and the soil profile on a seasonal basis (Month 1 through month 24)

Subtask 4.3: TAES will assess impacts of conversion from furrow irrigation to drip irrigation on nitrate concentration and water quantity at project scale by synthesizing current plot-scaled data on water and nitrogen use efficiency (assuming implementation of BMPs) to field scale and by monitoring and modeling water and nitrate balance on fields being implemented with BMPs and cost-share drip irrigation. (Month 12 through month 36)

Subtask 4.4: TAES will assess impacts of conversion from furrow irrigation to drip irrigation on nitrate concentration and water quantity at aquifer scale by coordinating with the SWCDs, NRCS, Rolling Plains Groundwater Conservation District and Lower Seymour Groundwater Conservation District to verify assumptions made when scaling up data and modeling fields being implemented with BMPs and cost-share drip irrigation (Month 24 through 48)

Subtask 4.5: TAES will forecast amount of irrigation conversion necessary to meet water quality standards (if achievable), BMP system efficacy and economics (cost/ac-ft), and amount of water savings over the expected life of drip irrigation systems. (Month 36 through 48)

Deliverables:

- Quarterly Reports
- Evaluation Report for inclusion in Final Report

Coordination, Roles and Responsibilities:

Participating Agencies and Organizations along with their roles in this project include:

- Texas State Soil and Water Conservation Board (TSSWCB): Project management. Responsible for technical review and certification of WQMPs. Provide assistance to the local SWCD in the implementation and development of WQMPs. Also assist the local SWCD in inventorying current BMPs and land use practices and the implementation of WQMPs. Provide training for the technician.
- Haskell Soil and Water Conservation District (SWCD): Oversee technician during the development and implementation of WQMPs/BMPs. Track BMP implementation using maps and spreadsheets.
- Wichita Brazos SWCD: Assist landowners with development and implementation of WQMPs.
- California Creek SWCD: Assist landowners with development and implementation of WQMPs.
- Natural Resources Conservation Service (NRCS): Work with and assist local SWCDs and TSSWCB in development and implementation of WQMPs.
- Texas Cooperative Extension (TCE): Provide water quality education
- Rolling Plains Groundwater Conservation District: Assist with evaluation of BMP effectiveness
- Lower Seymour Groundwater Conservation District: Assist with evaluation of BMP effectiveness
- Texas Agricultural Experiment Station (TAES): Assist with providing water quality education and evaluation of BMP effectiveness
- Texas Water Resources Institute (TWRI): Coordination of water quality education and monitoring activities.

Measures of Success:

- Demonstrate benefits of conversion to drip irrigation through implementation of approximately 15 WQMPs in the Haskell, Wichita Brazos, and California Creek SWCDs

- Conduct 5 education programs for local irrigators during the course of the project to increase producer awareness and use of irrigation and nutrient BMPs.

- Estimate of reductions in nitrate concentrations in the Seymour Aquifer and analysis of additional measures needed to achieve water quality standards.

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Itemized Budget

Object Class Category	Federal Funds	Non-Federal Match	Total Costs
1. Personnel			
Haskell SWCD			
Full Time Technician @ $28,000/yr	$129,600	$0	$129,600
Bookkeeper @ $10/hr @ 16 hrs/mo	$7,760	$0	$7,760
Subtotal Personnel	$137,360	$0	$137,360
2. Fringe Benefits			
Benefits@ 28%	$13,445		$13,445
Benefits@ 11.8%	$855	$0	$855
Subtotal Fringe	$14,300	$0	$14,300
3. Travel			
Mileage @ $0.35/mi for 750 mi/mo	$9,450	$0	$9,450
Subtotal Travel	$9,450	$0	$9,450
4. Equipment	$0	$0	$0
5. Supplies			
One Computer @ $3,500	$500	$0	$500
One Printer @ $1,000	$1,000	$0	$1,000
Software	$1,000	$0	$1,000
General Office Supplies @ $50/month	$1,800	$0	$1,800
Subtotal Supplies	$4,300	$0	$4,300
6. Contractual			
TWRI	$180,344	$124,572	$304,916
Financial Audit (Haskell SWCD)	$6,000	$0	$6,000
Subtotal Contractual	$186,344	$124,572	$310,916
7. Construction			
Haskell SWCD WQMP Implementation	$130,300	$86,867	$217,167
Wichita Brazos SWCD WQMP Implementation	$132,000	$88,000	$220,000
California Creek SWCD WQMP Implementation	$150,000	$100,000	$250,000
Subtotal Construction	$412,300	$274,867	$687,167
8. Other	$0	$0	$0
9. Total Direct Costs	$764,054	$399,439	$1,163,493
10. Indirect Costs	$0	$0	$0
11. Total Project Costs	**$764,054**	**$399,439**	**$1,163,493**

	Requested Funds			Matching Funds			TOTAL PROJECT
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	
SALARY							
Cristine Morgan				$3,200	$3,200	$3,200	**$9,600**
John Sij				$4,009	$0		**$4,009**
Jason Ott				$3,190	$0		**$3,190**
Todd Baughman				$3,874	$3,874	$0	**$7,748**
PhD Student-Morgan	$16,200	$16,686				$17,187	**$50,073**
Morgan- Technician	$4,350	$4,481	$4,611				**$13,442**
Technician @ Vernon	$10,000	$10,000					**$20,000**
Student worker (Vernon)	$1,848	$1,848					**$3,696**
BENEFITS							
Cristine Morgan				$726	$726	$726	**$2,177**
John Sij				$851	$0		**$851**
Jason Ott				$955	$0		**$955**
Todd Baughman				$830	$830	$0	**$1,660**
PhD Student-Morgan	$5,433	$5,325				$5,366	**$16,124**
Morgan- Technician	$1,364	$1,384	$1,404				**$4,152**
Technician @ Vernon	$2,469	$2,469					**$4,938**
Student worker (Vernon)	$152	$152					**$305**
Total Salary & Benefits	$41,816	$42,345	$6,015	$17,635	$8,630	$26,479	**$142,919**
SUPPLIES							
Rainfall gauge	$2,370						**$2,370**
Rain Accessories	$283						**$283**
Sample Bottles	$400						**$400**
Porous cups (100ea)	$7,200						**$7,200**
In-Line flow Gauges	$1,200	$2,400					**$3,600**
Sij Supplies	$1,500	$1,500					**$3,000**
Baughman & McFarland Supplies	$1,600	$1,460					**$3,060**
Total Supplies	$14,553	$5,360					**$19,913**
TRAVEL	$3,500	$3,500	$2,500				**$37,173**
Students Assistance	$6,300	$6,300					**$12,600**
OTHER DIRECT							
Water irrigation	$216	$324	$324				**$864**
Water soil	$2,592	$3,888	$3,888				**$10,368**
Plant Yields	$100	$150	$150				**$400**
Baughman & McFarland Other	$3,000						**$3,000**
QAPP Prep. & Project Mgmt	$10,000						**$10,000**
Total Other Direct	$15,908	$4,362	$4,362				**$24,632**
TOTAL DIRECT	$82,077	$61,867	$12,877	$17,635	$8,630	$26,479	**$237,237**
15% IDC	$12,312	$9,280	$1,932	$8,024	$3,927	$12,048	**$47,521**
Unrecovered IDC				$25,034	$18,869	$3,928	**$47,830**
Total	**$94,389**	**$71,147**	**$14,809**	**$50,692**	**$31,426**	**$42,454**	**$304,916**
		$180,344			$124,572		
Match		59%			41%		