

**ATRAZINE REMEDIATION IN THE LAKE LAVON
WATERSHED of COLLIN COUNTY, TEXAS**



**ATRAZINE REMEDIATION IN THE LAKE LAVON
WATERSHED of COLLIN COUNTY, TEXAS**

under the

Clean Water Act, Section 319(h)

Cooperative Agreement No. 01-4

between the

TEXAS STATE SOIL AND WATER CONSERVATION BOARD

and the

**COLLIN COUNTY
SOIL AND WATER CONSERVATION DISTRICT**

In collaboration with

**U. S. Department of Agriculture
Natural Resources Conservation Service
Texas Department of Agriculture
Collin County Extension Service**

Final Report

By

Johnnie J. Kay
Project Technician

TABLE OF CONTENTS

INTRODUCTION

SCOPE OF PROJECT

NARRATIVE OF PROJECT ACCOMPLISHMENTS

PROJECT ACCOMPLISHMENTS BY TASK

TASK 1: Program Coordination and Management

TASK 2: Water Quality Education and Demonstration of WQMPs

TASK 3: Development and Implementation of WQMPs

TASK 4: Inventory of Land Use Practices in the Lake Lavon Watershed

APPENDIX A: News Articles

APPENDIX B: Photos of Water Quality Practices Used in the Project

APPENDIX C: Maps

Collin County Location Map

Lake Lavon Watershed Drainage Area

WQMP Locations within Watershed Area

APPENDIX D: Addendum

XL spreadsheet of BMPs

Introduction

Atrazine, a growth inhibitor involving the photosynthetic process, is a herbicide commonly used by corn and grain sorghum growers to control weeds. The herbicide is considered unsafe by the Environmental Protection Agency when concentrations exceed the MCL for drinking water, which is 3 parts per billion. Its use in the Lake Lavon Watershed created a need for remediation.

The Lake Lavon Watershed is located on the East Fork of the Trinity River and encompasses land located in four counties, namely Collin, Fannin, Grayson and Hunt. This report is concerned with that part of the drainage area located in Collin County and further identified as the North Texas Atrazine Project # 01-4, (District 535-Collin).

The prevalent *Blackland Prairie* soils in the area support cultivated crops such as cereal grains, corn, grain sorghum and very limited soybeans with the less productive land being utilized for hay and pasture, mainly for cattle and horses. Weed control in corn and grain sorghum crops with the use of Atrazine in the 1990s created a level of the chemical sufficient for detection in the Lake Lavon drinking water supply. This non-point source pollution placed the watershed on the *State of Texas 303(d)* list.

Awareness of the situation was through contacts by the Texas State Soil and Water Conservation Board representatives who met with the local board in 1999. Treatment for pollution abatement efforts in Collin County was through a joint agreement between the Texas State Soil and Water Conservation Board and the Collin County Soil and Water Conservation District. Funding was provided by the EPA's Clean Water Act, 319 Grant Program.

The remediation project was via cost shared and non-cost shared Best Management Practices (BMPs). Cost shared practices were selected by the local board from the "TSSWCB Approved Practices List". Non-cost shared practices were those NRCS approved practices needed in Resource Management System planning. Invitations to participate in the program were extended by letter and media releases to selected corn and grain sorghum producers and were offered on a non-discriminatory basis.

Scope of the Project

The Lake Lavon Watershed of Collin County drains approximately 347,000 acres of land located in the eastern part of the county. The boundary of the area can be described as follows: Starting at the southeast corner of the Grayson County line which is located on the west boundary of the Fannin County line just north SH 121, about 3 miles southwest of Trenton; then south along the Collin-Fannin County line approximately 3.9 miles; then east-northeast along the Collin-Fannin County line about 5.2 miles to the Hunt County line; then south along the Collin-Hunt Collin line approximate 8.9 miles to a point near CR 663; then southwesterly along the highs separating the drainage areas approximately 2 miles to the junction of CR 702 and FM 2194; then generally along FM 2194 to its juncture with CR 656, located NE of Farmersville; then in a southerly direction crossing and re-crossing FM 547; then more southwesterly and reaching a point about 1 mile north of Nevada; then generally westward across the Lake Lavon Dam; then northwesterly through Allen continuing to the east side of Prosper; then northerly and somewhat parallel to SH 289 to a point on the Collin-Grayson county line about 1 mile on the east side SH 289; then eastward along this line to the point of beginning. This watershed is composed of three smaller watersheds for the purpose of flood retardation, namely East Fork of the Trinity River, Sister Grove Creek and Pilot Grove Creek See Maps (Appendix D).

The project was set up for 25 water quality management plans utilizing \$250,000 to assist landowners in implementing BMPs for water quality.

Cooperative agreement No.01-4 between the Texas State Soil and Water Conservation Board and the Collin County Soil and Water Conservation District was signed by the district chairman on June 5, 2001. This agreement stated authorization granted to the TSSWCB by the TEXAS AGRICULTURE CODE 201.026 to assist the United States Environmental Protection Agency. The duration of the project was initially set for three years. An extension of twelve months was requested and obtained. An additional twelve-month extension was granted to extend the project through March 31, 2006. These extensions were obtained based on weather and personnel issues plus the USDA guidelines for sequencing certain practices based on the successful establishment of prerequisite practices in a plan. Agreement No. 01-4 delineates the separate and mutual terms and responsibilities of the TSSWCB and The Collin County SWCD. In summary, the TSSWCB agreed to reimburse the Collin County Soil and Water Conservation District for specified deliverables according to the terms of the agreement.

The contract will be fulfilled when final reimbursement is made by the TSSWCB for agreed-to deliverables submitted by the Collin County SWCD.

Narrative of Accomplishments

The district was approached by the TSSWCB and informed of the proposed atrazine abatement project. The issue was discussed in the district board meeting on December 5, 2000. Kenny Zajicek and Kevin Canfield from TSSWCB fielded questions at the regular board meeting on March 6, 2001. The Collin County SWCD voted unanimously to enter into contract with the TSSWCB on June 5, 2001.

Beau Brooks was hired as project technician and began work on September 10, 2001. Preparations for accomplishing the tasks were made by providing office space and buying supplies and equipment. Corn and grain sorghum producing farms and farm operators in the watershed were identified from FSA records.

The district directors approved parameters of the project by prioritizing crops and land use for BMP application. High, medium and low priority levels were set. Corn and grain sorghum producing cropland received top priority, other cropland with erosion problems received medium priority and abandoned cropland, pasture and hayed land received low priority. The total production unit was planned through the Resource Management System guidelines.

Funding limitations were imposed on each plan. The maximum dollar limit for a unit associated with a farm ID number was set at \$10,000. A limit of 75% funding level was attached to each funded practice based on the lower amount of the actual producer cost of the practice or the USDA approved average cost of the practice.

Using the guidelines and information above, land users in the watershed were notified of the project. Sign-up for planning assistance began on December 1, 2001 and ended in January, 2002. Applications from interested farmers were filed chronologically and prioritized as high, medium or low at the end of the initial sign-up. This assured fair and impartial access to the allocated funds. After the initial sign-up funds were then made available on a chronological first-come-first-serve basis.

Implementation of practices began in FY 02 and continued through the last Quarter of the project ending with the Second Quarter FY-06 (March 31, 2006). Initially, practices that failed due to nature and through no fault of the producer were ineligible for refunding. This was changed in cases where funds were available and some 512 practices were funded again. A total of 15 BMPs were utilized in the various WQMPs with Nutrient and Pest Management practices applied to the greatest number of acres. Cross fencing was initially planned to include 3,350 feet. Its construction had a prerequisite of boundary fencing which was not constructed, therefore, no cross fencing was built.

Monthly reports to Collin County SWCD board were made. Monthly time logs and expenditures for supplies were sent to the TSSWCB. Requests for reimbursement were made in a timely manner and the reimbursements were punctual from the TSSWCB. Quarterly progress reports were made. A final report of the project was presented for review by the TSSWCB and three electronically reproduced reports (CDs) were submitted.

Three technicians were involved with the project. Beau Brooks started the project, (9/10/01- 10/23/02) Darrell Helm worked mid-term, (2/1/03-11/24/04) and Johnnie Kay completed the project (4/1/05- 3/31/06). Clyde Hogue, NRCS, provided invaluable advice and assistance throughout the duration of the project.

Project Accomplishments by Task

Final Report

North Texas Atrazine Remediation Project

TSSWCB # 01-4

Program Element	Subtasks	Project Activities	Deliverables Submitted	Completion Status
<i>TASK 1: Program Coordination & Management</i>	1.1 Hire Planner	Project planner started on 9/10/2001	Filed in SWCD minutes	100%
	1.2 Reports to Board	Oral and written reports to Board	Filed in SWCD minutes	100%
	1.3 Quarterly Reports	Progress and MBE/WBE Reports	Copies submitted to TSSWCB	100%
	1.4 CCE Management	Computers Installed For Use In Project Planning		100%
	1.5 Planner Training	a. Two training sessions at TSSWCB, Temple b. Training sessions from TSSWCB Regional Office, Mt. Pleasant c. Ongoing training from NRCS personnel d. Formal Training for; Windows XP and Microsoft Outlook Microsoft XL and Microsoft Word Toolkit 2004 f. Numerous field days, tours and specialty programs that included pesticide training & NPS pollution awareness	Noted in Time log	100%
	1.6 Meetings	a. District board meetings b. NRCS team meetings c. EQIP program LWG participant	Filed in SWCD minutes Filed in SWCD minutes Filed in SWCD minutes	100% 100% 100%
	1.7 Contract Extensions	Requested and received extension of contract #01-4 to 3/31/06	Letter submitted	100%
	1.9 Final Report	Draft submitted for checking. Three electronic copies made	3 copies submitted	100%
	1.10 Project Modeling	Specific information related to completed plans was submitted for project modeling to the Blackland Research Station, Temple	Copies submitted	100%

<i>TASK 2: Water Quality Education and Demonstration Of BMPs</i>	2.1 Presentations	a. Informal Presentation to the Collin County Crop Production Committee	Recorded in district files	100%
		b. Power Point Presentation of GSS (Wood Toewall) to local SWCD	Recorded in district files & Copy submitted with Final Report	100%
<i>TASK 3: Development & Implementation Of 25 WQMPs</i>	3.1 WQMP Requests	20 requests for planning assistance received	Copies submitted	100%
	3.2 District Activities	Assisted with District activities of seed sales Assisted with District windbreak tree sales	Recorded in time logs	100%
	3.3 NRCS Programs	Assisted with NRCS Programs as requested EQIP local work group committee member	Recorded in time logs	100%
	3.4 Planning	10 plans certified	Copies submitted	40%
	3.5 Mapping	Arc View plan mapping and Garmin GPS practice certification	Copies submitted	100%
	3.6 Cost Share Requests	Revisions to cost shared practices were approved by Collin SWCD	Copies submitted	100%
	3.7 Status Reviews	Annual Status Reviews completed on all plans before project ended	Copies submitted	100%
<i>TASK:4 Inventory of Land use Practices Implemented in The Lake Lavon Watershed</i>	4.1 See Table I	Inventory of Practices and Soil Loss Reduction	Copy submitted	100%
	4.2 XL Spreadsheet	XL sheet is also available if needed for TSSWCB report. It will be added as a separate document. (See Appendix D)	Separate Copy submitted	100%

Table I. Inventory of Practices and Soil Loss Reduction

Practice Name →→→→→→→→		Filter Strip	Conservation Cover	Conservation Crop Rotation	Contour Farming	Critical area Planting	Fence	Forage Harvest Management	Grassed Water-way	Heavy Use Area Protection	Nutrient Management	Pasture and Hay Planting	Pest Management	Prescribed Grazing	Grade Stabilization Structure	Residue Management	Upland Wildlife Habitat Management	Annual Load Reduction	
Practice No. →→→→		393	327	328	330	342	382	511	412	561	590	512	595A	528A	410	344	645	Tons of soil Saved	3/31/2006 Plan Status ↓↓
WQMP No. ↓	Farm Acres	Acre	Acre	Acre	Acre	Acre	Feet	Acre	Acre	Acre	Acre	Acre	Acre	Acre	Units	Acre	Acre		
535-02-001	111							86		1	110		110	24				365	Comp. W / ASR
535-02-002	278							166		6	259	59	301	106				605	Comp. W / ASR
535-04-005	97			87					4		97		97		2	87		√	Comp. W / ASR
535-04-009	111	1.5		82.5	82.5	1			3		103.5		104			82.5		439	Comp. W / ASR
0535-3-010	53					3		30			53	28.6	53					295	Comp. W / ASR
535-03-016	15										15	15	15	15				118	Comp. W / ASR
535-04-017	20										20	20	20	20				127	Comp. W / ASR
535-04-018	63									2	61	10	61	61				324	Comp. W / ASR
535-04-019	125										80.2	80.2	80.2	95			30	628	Comp. W / ASR
535-05-022	603							25.1			577	82.6	577	577				375	Comp. W / ASR
Totals	1,476	2	0	170	83	4		307	7	9	1,376	295	1,418	898	2	170	30	3,276	

APPENDIX A

NEWS ARTICLES

To apply for coverage, an application must be filed at the FSA office and an administrative fee of \$100 per crop covered not to exceed \$300 per county must be paid. This fee is non-refundable. Final dates to apply for the program will be set at least thirty days prior to the normal planting period. For perennial crops, the final date to apply will be in December of the year preceding coverage. The acreage must be designated for haying or grazing by this deadline or coverage does not apply. Acreage planted after the final reporting date is not eligible. Yields set by FSA or "Actual Production History" will be used to establish a farm yield. Grazing will be based upon Animal Unit Days. Coverage is based on 50% of the yield set for the crop or pasture. To be eligible for potential benefits, harvested/appraised production or grazing must be less than 50% of the established yield. All damaged or prevented planting acreage must be reported to the FSA office within 15 days of the date of loss or within 15 days after the final planting date for the crop. All damaged or prevented planting acres require an inspection prior to making other use of the destroyed crop acreage. If hayland is intended for baling and is baled and grazed, sometime prior to grazing, the applicant must panel off representative areas to be appraised at the end of the grazing period.

In general producers must comply with the eligibility provisions for a "person" determination. The payment limitation is \$100,000 per person. Each person must certify compliance with highly erodible land and wetland conservation compliance provisions. There is a qualifying income maximum of \$2 million gross receipts annually.

New Cost Share Program (WQMP)

The Collin County Soil & Water Conservation District is announcing the implementation of a new cost share program designed to bring about a reduction in the levels of atrazine in the Lake Lavon and Lake Tawakoni watersheds. Although the levels of atrazine are very small at this time, funds are being made available by the EPA and administered by the Texas State Soil and Water Conservation Board.

Atrazine is a herbicide that is used in the production of corn and grain sorghum. It is also contained in certain weed and feed fertilizers used by homeowners. If the use of atrazine is prohibited, producers will be forced to use other herbicides that come at higher costs.

The cost share program will offer producers of corn and grain sorghum an opportunity to help themselves. Increased contamination of area lakes and watersheds could result in the loss of this important weed control tool.

The Atrazine Remediation Project offers 75 percent cost sharing on such control measures as waterways, terraces, field borders, buffer strips, critical area treatments, and hayland and pasture plantings. The participant will be required to pay 25 percent of the cost.

Producers and landowners can make applications for cost sharing through the SWCD office. Signup period will start December 1, 2001 and go through January 18, 2002. After the initial enrollment, WQMP's will be developed on a priority basis. There will be additional signups offered depending on funds availability.

For further information contact:

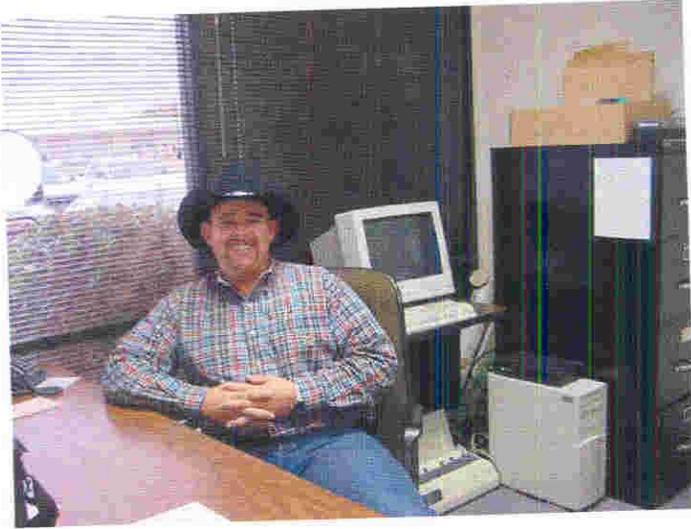
Beau Brooks
Collin County Soil and Water Conservation District
1406 D North McDonald St.
McKinney, Texas 75071
Phone (972) 542-0081 ext. 3

COUNTY OFFICE STAFF

H. Paul Newhouse, County Executive Director
Eileen Haley, Chief Program Technician
Ellen J. LaFoy, Program Technician
Darlene Seymour, Program Technician
Rita J. Veale, Program Technician

COLLIN COUNTY FSA COMMITTEE

Kenneth Strickland, Chairperson
Nathan McTee, Vice-Chairperson
Donald L. Vest, Member
Sally J. Lewis, Advisor



New District Employee

Beau Brooks, Collin County SWCD Technician, started full-time on September 10 for the Collin County Soil and Water Conservation District of McKinney. He will be working on a new Water Quality Management Program designed to reduce the atrazine level in Lake Lavon and Lake Tawakoni. Before his full-time appointment at McKinney, he was a student at Tarleton State University, graduating in December 2000 with a Bachelor of Science Degree in Agricultural Services and Development.

Beau has been involved in agriculture throughout most of his life and enjoys every aspect of agriculture. His experience started in custom grain harvesting when he was 11 years old, and now he is a ranch manager for Smith Angus Ranch in Bells, Texas where he resides.

As technician for the Collin County SWCD his duties will include:

- (1) Program Coordination and Management for the North Texas Atrazine Remediation Project
- (2) Water Quality Education and Demonstration of Best Management Practices to Reduce Atrazine Runoff
- (3) Development and Implementation of WQMP's (Water Quality Management Programs)
- (4) Inventory of Land Use Practices and BMP's Implemented in the Lake Lavon and Lake Tawakoni Watersheds.

Beau is the son of Keith and Gloria Brooks of Sherman, Texas; the grandson of Jay and Lois Gotcher of Pottsboro, David Brooks and the late Martha Brooks of Trenton.



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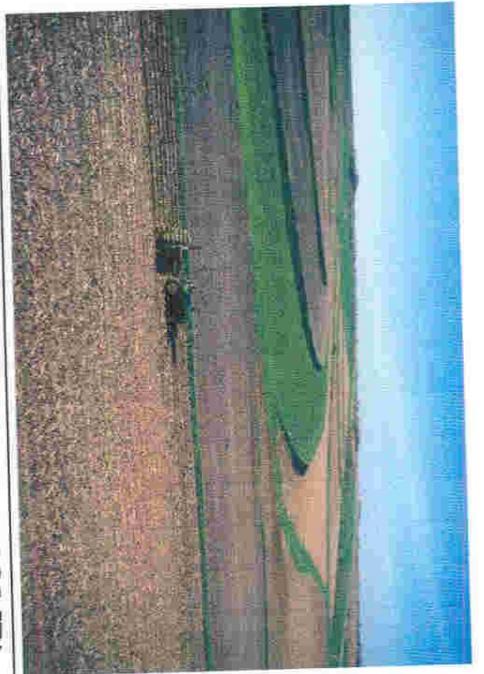
Beau Brooks

Collin County Soil and Water Conservation District

06 D North McDonald St.

McKinney, Texas 75071

Phone (972) 542-0081 ext. 3



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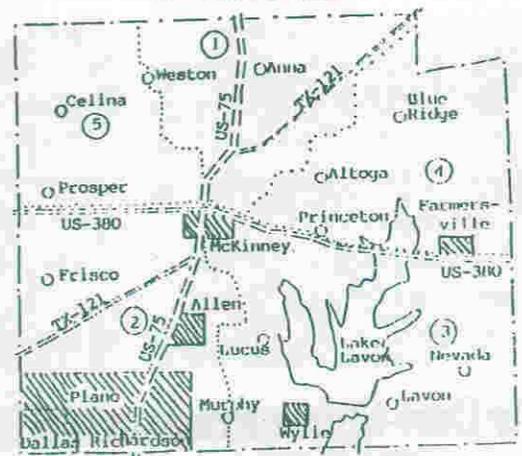
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1406 N. McDonald Street
Suite D, McKinney, TX 75071 - Phone: (972) 542-0081 ext. 3

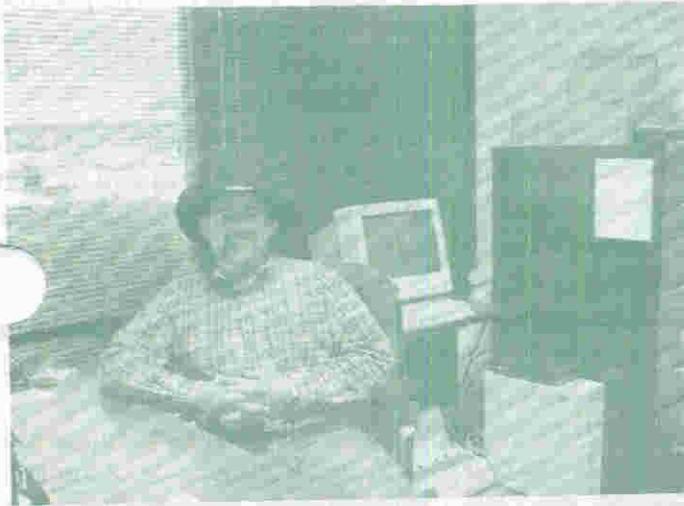
LEGEND
— ZONE BOUNDARY
○ ZONE NUMBER



R.E. "Butch" AYCOCK, Chairman
WARREN BLACKMON, Vice Chairman - KENNETH LeFORGE, Secretary
ROBERT L. KING, Director - BEN SCHOLZ, Director
The District Board meets the first Tuesday night of each month

Volume 6, No. 2

December 2001



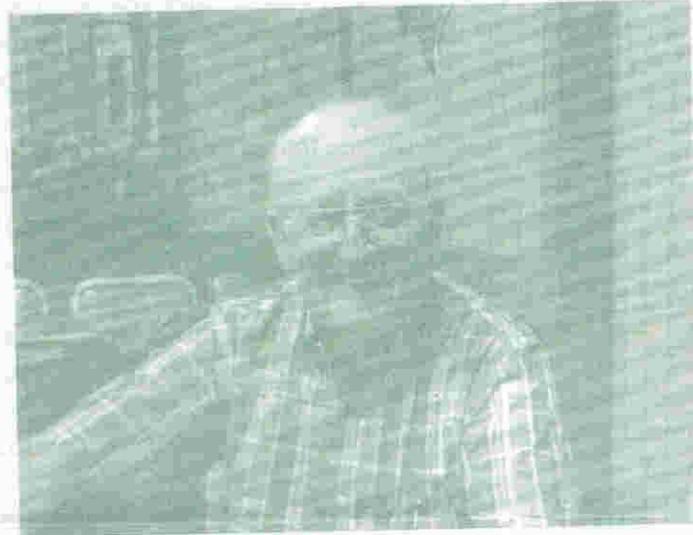
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As technician for the Collin County SWCD, his



New District Employee

Bob King of Celina has been reelected as the Director for Zone 5. The election was held on October 2, 2001 at Steak Kountry, 152 Westgate Shopping Center in McKinney at 6:00 p.m.

The Board of Directors is composed of five persons representing each zone. They serve staggered four-year terms with the terms of one or two members expiring each year. The Director election is held each year in October.

Zone 5 was up for election this year. Subdivision 5 is in the northwestern corner of the county including Prosper, Celina, Bloomdale, and part of McKinney.

Agriculture producers at convention-style elections each October elect the District Directors. In order to

Owner/ Operator Letter

To: Collin County Owners/Operators

From: Collin County Soil & Water Conservation District

Subject: Atrazine Remediation Program

The Collin County SWCD is administering an Atrazine Remediation Project as a cost-share program designed to reduce or eliminate atrazine levels in the Lake Lavon and Lake Tawakoni Watersheds.

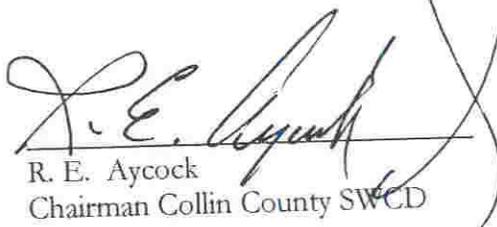
Under this program, cost-sharing is offered for 75% of the cost of implementing the Best Management Practice or conservation measures best suited to correct the problem. Such practices as waterways, terraces, field boundaries, filter strips, critical area treatment, and pasture/hayland planting are offered. Participants must have a plan developed on all of the land under their control.

Cost-shares are limited to a maximum of \$10,000 per producer.

Those fields devoted to corn or grain sorghum in 1 of the last 3 years are considered as top priority areas.

Atrazine is of great benefit to corn and grain sorghum producers. Continued contamination of area watersheds, however, could result in its being pulled from the market. We need to take advantage of this program to correct the atrazine problem in our area, while at the same time benefiting from some good conservation measures.

If you have land in the Lake Lavon or Lake Tawakoni Watersheds and wish to discuss cost-sharing, you can call Beau Brooks at (972) 542-0081 ext. 3 or come by the Collin County Soil and Water Conservation District office located in the USDA- Natural Resources Conservation Service (NRCS) building at 1406D North McDonald St., McKinney.



R. E. Aycock
Chairman Collin County SWCD

APPENDIX B

Photographs of the Project



Collin County SWCD Directors (L-R) Robert King member, zone 5; Ken LeForge, Sec., zone4; R.E. Aycok, Jr., Chairman, zone 1; Warren Blackmon, Vice Chairman, zone 2; and Ben Scholz, member, zone 3.



Cropland field to be converted to grass with proper seedbed preparation .



Close up view of planted grass.



Well-established grass was sprayed to control unwanted weed.



Volunteer vegetation to be controlled before planting to grass.





Old terraces which were not maintained, allowing water to create gullies.



A close up view of the gullies



The waterway above is staked and reconstructed





A wood toewall is constructed near the end of the of the waterway to provide four feet of vertical drop for the discharged water





Construction details showing foundation forms being filled with wet concrete and the cured concrete ready for the form removal. (Below)





Four by six planks treated for the prevention of rot to USDA specifications is ready to be installed. Fasteners include galvanized ring-shank nails and 10” bolts.





Filter fabric is applied to the upstream side of the walls to prevent soil from being washed through the cracks in the walls.





Compaction of the soil is needed to prevent excessive settling around the walls. A completed toewall with rock riprap to control erosion at site of water discharge is shown below.





Freshly harvested Tifton 85 sprigs are placed into the sprigging machine.



A good seedbed is very important to get a good quality stand.



A good stand of Coastal Bermuda is producing good yields of hay and affording excellent protection from erosion and chemical run-off. Soil loss savings are calculated at 6.4 tons per acre annually with the application of the planned BMPs.



This waterway and aluminum toewall are being compromised by gully erosion. Repair is essential for continued functionality of the system.





Earth work repairs to toewall and reshaping of the waterway accomplished.

Photo below shows re-vegetated waterway.

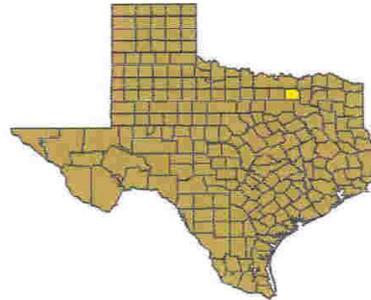




This photo was made in February, 2006. It was taken below the toewall and shows the same upstream view of the waterway as in the previous photograph.

APPENDIX C
MAPS

North Central Texas Atrazine Remediation Project (Collin County SWCD)



NPS Category	Agriculture
Contractor	Collin County SWCD #535
HUC	12030106
Total Funds	\$493,783
303(d) Waterbody ID #	0821
County	Collin
Watershed	Lake Lavon
Project Start Date	June 8, 2001
Project Goals	Implementation of 25 WQMP's

Lake Lavon is listed as threatened by atrazine on the 1999 State of Texas 303(d) List. This lake is important drinking water supplies for North Central Texas. Atrazine is a commonly used broadleaf herbicide applied to corn and sorghum.

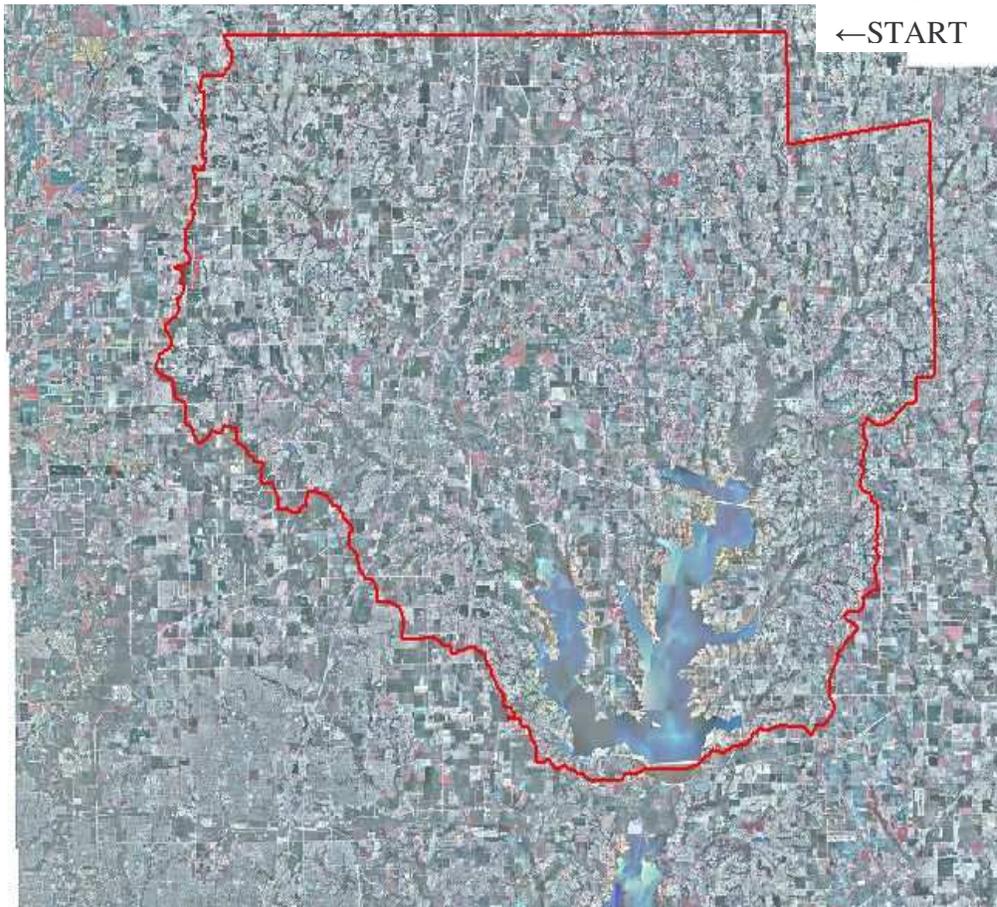
This project will provide corn and sorghum producers within the watershed, with an opportunity to participate in water quality educational activities, technical assistance, and financial assistance to implement Best Management Practices (BMP's) to reduce the runoff of atrazine; thus restoring the water quality of these lakes. BMP's may include, but are not limited to, buffer strips, terraces and grassed waterways, and integrated pest management.

The Texas State Soil and Water Conservation Board (TSSWCB) will work cooperatively with the Collin County SWCD, Natural Resource Conservation Service (NRCS), Texas Cooperative Extension (TCE), Texas Department of Agriculture, and Texas Agricultural Experiment Station (TAES) to provide water quality education, BMP demonstration, and technical/financial assistance to corn and sorghum producers.

Collin County SWCD
Beau Brooks
1406-D N McDonald St.
McKinney, Texas 75069
Phone (972) 542-0081

TSSWCB Contact:
Kevin Canfield
Phone (254) 773-2250
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Location of Project within Collin County



The Lake Lavon Watershed of Collin County drains approximately 347,000 acres of land located in the central and eastern part of the county. The boundary of the area can be described as follows: Starting at the southeast corner of the Grayson County line which is located on the west Fannin County line, just north SH 121, and about 3 miles southwest of Trenton; then south along the Collin-Fannin County line approximately 3.9 miles; then east-northeast along the Collin-Fannin County line about 5.2 miles to the Hunt County line; then south along the Collin-Hunt County line approximate 8.9 miles to a point near CR 663; then southwest along the high separating the drainage areas approximately 2 miles to the junction of CR 702 and FM 2194; then generally along FM 2194 to its juncture with CR 656, located NE of Farmersville; then in a southerly direction crossing and re-crossing FM 547; then more southwesterly and reaching a point about 1 mile north of Nevada; then generally westward across the Lake Lavon Dam; then northwesterly through Allen continuing to the east side of Prosper; then northerly and somewhat parallel to SH 289 to a point on the Collin-Grayson county line about 1 mile on the east side SH 289; then eastward along this line to the point of beginning. This watershed is composed of three smaller watersheds for the purpose of flood retardation, namely East Fork of the Trinity River, Sister Grove Creek and Pilot Grove Creek.

