



United States
Department of
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Natural
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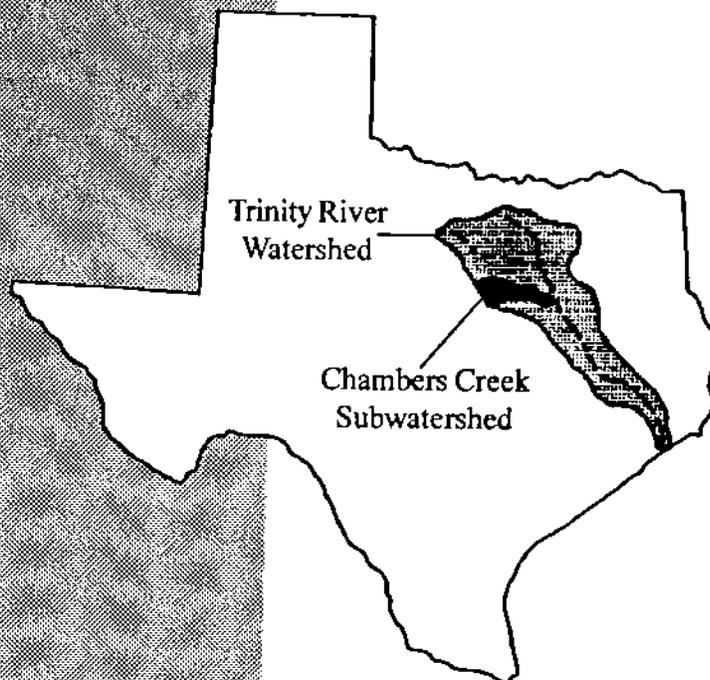
Temple,
Texas

SUPPLEMENTAL WORK PLAN AND AGREEMENT NO. VII

CHAMBERS CREEK SUBWATERSHED

OF THE TRINITY RIVER WATERSHED

Johnson, Hill, Ellis and
Navarro Counties, Texas



In cooperation with:
Navarro Soil and Water Conservation District
Ellis-Prairie Soil and Water Conservation District
Hill County-Blackland Soil and Water Conservation District
Johnson County Soil and Water Conservation District
Dalworth Soil and Water Conservation District
Navarro County Commissioners Court
Johnson County Commissioners Court
Ellis County Commissioners Court
Hill County Commissioners Court
City of Alvarado, Texas
City of Ennis, Texas

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INTRODUCTION

Public Law 78-534, Flood Control Act of 1944, as amended, is the statutory authority for planning and installation of soil, water and flood control works of improvement in the Trinity River Authorized Watershed and its subwatersheds. A watershed protection and flood prevention plan for the Chambers Creek drainage area, a subwatershed within the Trinity River Authorized Watershed, became effective on December 9, 1955. Chambers Creek Watershed Plan was prepared by local sponsoring organizations with technical assistance from the Natural Resources Conservation Service (formerly the Soil Conservation Service). The U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department assisted in preparation of the fish and wildlife aspects of the Watershed Plan. Financial assistance for development of the plan was provided by the Texas State Soil and Water Conservation Board and the Natural Resources Conservation Service (NRCS).

The 1955 Watershed Plan has seven supplemental plans and respective agreements between the Natural Resources Conservation Service and the sponsoring local organizations. The supplemental plans addressed the following issues:

- Supplement I - Added Navarro, Hill, Johnson, and Ellis county
1959 commissioners courts as sponsors
- Supplement II - Added floodwater retarding structure site 42A
1961 as a multiple-purpose reservoir for the city of Alvarado and deleted floodwater retarding structure sites 30A, 39, 40, 41, 42B, and 42D.
- Supplement III - Comply with provisions of the Uniform Relocation
1971 Assistance and Real Property Acquisition Policies Act of 1979.
- Supplement IV - provided for the use of WF-03 flood prevention
1976 funds on a cost-share basis to install land treatment measures to control and stabilize critical sediment source areas on about 2,600 acres of watershed land.
- Supplement V - Added the city of Ennis, Texas as a local sponsor.
1988 The City agreed to provide proper and adequate operations and maintenance for floodwater retarding structure 20A.
- Supplement VI - Deleted grade stabilization structure No. 13.
1991
- Supplement VII - Provides for structural and vegetative measures to
1995 control excessive erosion in Mill Creek channel.

Various other letters and memos have made additions and corrections to the Watershed Plan.

Chambers Creek, a subwatershed of the Authorized WF-03 Trinity River Watershed, is located in Navarro, Ellis, Hill, and Johnson counties, and comprises an area of approximately 1,073 square miles. Mill Creek, a tributary to Chambers Creek, has a drainage area of approximately 108 square miles. Mill Creek confluences with Chambers Creek above Richland-Chambers Reservoir, a water source for the city of Fort Worth.

Severe Mill Creek channel erosion and widespread streambank slope failure are destroying or endangering soils, crops, pasture, wildlife habitat, county and state roads, bridges, installed conservation measures and floodwater retarding structures, and private income. Supplemental Watershed Plan and Agreement No.VII addresses these problems by providing structural and vegetative streambank stabilization measures not in the 1955 Chambers Creek Watershed Plan and Agreement.

Seven gabion chute structures are added to the works of improvement. Four structure sites are located in Mill Creek, and three structures in tributaries to Mill Creek. Woody vegetation (bioengineering) will be established on critically eroding Mill Creek streambanks and in conjunction with gabion chute structures.

Also, to adhere to NRCS policy, Supplemental Watershed Plan and Agreement No.VII includes stipulations regarding a drug-free work place and restrictions on lobbying activities by certain individuals.

Project structural measures currently installed within Mill Creek drainage area include 13 single-purpose floodwater retarding structures. There is no PL-534 channel work on Mill Creek.

SUPPLEMENTAL WATERSHED AGREEMENT NO. VII

CHAMBERS CREEK WATERSHED, TEXAS

Between the following local organizations:

Navarro Soil and Water Conservation District
Ellis-Prairie Soil and Water Conservation District
Hill County-Blackland Soil and Water Conservation District
Johnson County Soil and Water Conservation District
Dalworth Soil and Water Conservation District
Navarro County Commissioners Court
Ellis County Commissioners Court
Hill County Commissioners Court
Johnson County Commissioners Court
City of Alvarado, Texas
City of Ennis, Texas

(Referred to herein as the Sponsors)

and the,

Natural Resources Conservation Service
(formerly Soil Conservation Service)
United States Department of Agriculture
(Referred to herein as NRCS)

Whereas, the watershed plan for Chambers Creek Watershed, State of Texas, executed by the Sponsors named therein and the NRCS, became effective on the 9th day of December, 1955; and

Whereas, a Supplemental Watershed Plan Agreement No.I executed by the Sponsors named therein and the NRCS, became effective on the 14th day of April 1959; and

Whereas, a Supplemental Watershed Plan Agreement No.II executed by the Sponsors named therein and the NRCS, became effective on the 25th day of October 1962; and

Whereas, a Supplemental Watershed Plan Agreement No.III executed by the Sponsors named therein and the NRCS, became effective on the 4th day of February 1972; and

Whereas, a Supplemental Watershed Plan Agreement No.IV executed by the Sponsors named therein and the NRCS, became effective on the 8th day of March 1976; and

Whereas, a Supplemental Watershed Plan Agreement No.V executed by the Sponsors named therein and the NRCS, became effective on the 24th day of March 1988; and

Whereas, a Supplemental Watershed Plan Agreement No.VI executed by the Sponsors named therein and the NRCS, became effective on the 31st day of May 1991; and

Whereas, in order to carry out the Chambers Creek Watershed Plan for said watershed, It has become necessary to modify said watershed agreement as supplemented; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Control Act, as amended, has been assigned by the Secretary of Agriculture to the Natural Resources Conservation Service (NRCS); and

Whereas, a Supplemental Watershed Plan No.VII which modifies the Chambers Creek Watershed Plan dated December 9, 1955 for said watershed has been developed through the cooperative efforts of the Sponsors and the NRCS;

Now, therefore, the Secretary of Agriculture through the NRCS and the Sponsors hereby agree upon the following modifications of the terms, conditions, and stipulations of said Chambers Creek Watershed Plan and Agreement, as supplemented;

- [1]. Seven stream channel stabilization structures are to be installed in Mill Creek and tributaries
- [2]. Associated channelbank and riparian area vegetative measures (herein referred to as Bioengineering) will be established
- [3]. The Navarro Soil and Water Conservation District and the Navarro County Commissioners Court (Local Organizations) will acquire without cost to the federal government such landrights as will be needed in connection with the Mill Creek Works of Improvement (Estimated cost \$33,700).

The percentages of this cost to be borne by the Local Organizations and the NRCS are as follows:

Works of Improvement, Streambank Stabilization	Local Organizations (percent)	NRCS (percent)	Estimated Costs for Construction (dollars)
Structures	100.0	0.0	0
Bioengineering	100.0	0.0	0
Legal Fees and Easements	100.0	0.0	33,700

- [4]. The percentages of construction costs of the Mill Creek Works of Improvement to be paid by the Navarro Soil and Water Conservation District (Local Organization) and by the NRCS are as follows:

Works of Improvement, Streambank Stabilization	Local Organization (percent)	NRCS (percent)	Estimated Construction Cost (dollars)
Structures	0.0	100.0	1,073,700
Bioengineering	0.0	100.0	1,633,300

[5]. The percentages of the cost for Mill Creek engineering and project administration to be borne by the Navarro Soil and Water conservation District (Local Organization) and by the NRCS are as follows:

Works of Improvement, Streambank Stabilization	Local Organization (percent)	NRCS (percent)	Estimated Engineering and Project Adm. Costs (dollars)
Structures	0.0	100.0	181,500
Bioengineering	11.1	88.9	4,500

[6]. The following stipulations are appended to the plan agreement in accordance with the certification regarding drug-free workplace requirements (7CFR 3017, Subpart F) as follows:

By signing this watershed agreement, the Sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation (21 CFR 1308.11 through 1308.15);

Conviction means a finding of (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of subrecipients or subcontractors in covered workplaces).

Certification:

A. The sponsors certify that they will or will continue to provide a drug-free workplace by:

- (1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

- (2) Establishing an ongoing drug-free awareness program to inform employees about:
 - (a) The danger of drug abuse in the workplace;
 - (b) The grantee's policy of maintaining a drug-free workplace;
 - (c) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
 - (3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);
 - (4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:
 - (a) Abide by the terms of the statement; and
 - (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
 - (5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;
 - (6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4)(b), with respect to any employee who is so convicted:
 - (a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.
 - (7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6)
- B. The sponsors may provide a list of the site(s) for the performance of work done in connection with a specific project or other agreement.
- C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

[7]. the following is appended to the plan agreement in accordance with the certification regarding lobbying (7 CFR 3018) as follows:

(1) The sponsors certify to the best of their knowledge and belief, that:

- (a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (c) The sponsors shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

(2) This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

[8]. the following is appended to the plan agreement in accordance with the certification regarding debarment, suspension, and other responsibility matters - primary covered transactions (7 CFR 3017) as follows:

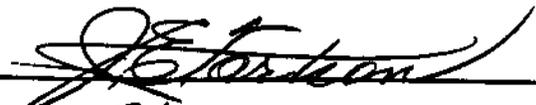
(1) The sponsors certify to the best of their knowledge and belief, that they and their principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the primary sponsors are unable to certify to any of the statements in this certification, each prospective participant shall attach an explanation to this agreement.

The Sponsors and NRCS further agree to all other terms, conditions, and stipulations of said watershed agreement not modified herein.

**Navarro Soil and Water Conservation District
Local Organization**

By 
Title Chairman
Date Aug 18, 1995

The signing of this agreement was authorized by a resolution of the governing body of the Navarro Soil and Water Conservation District adopted at a meeting held on Aug. 18, 1995.


(Secretary, Local Organization)

**Navarro County Commissioners Court
Local Organization**

By 
Title County Scribe
Date 8-28-95

The signing of this agreement was authorized by a resolution of the governing body of the Navarro County Commissioners Court adopted at a meeting held on Aug. 28, 1995.


(Secretary, Local Organization)

Hill County-Blackland Soil and Water Conservation District
Local Organization

By Henry J. Ruch
Title Chairman
Date 9-20-95

The signing of this agreement was authorized by a resolution of the governing body of the Hill County-Blackland Soil and Water Conservation District adopted at a meeting held on 9-11-95.

Chad F. Powell
(Secretary, Local Organization)

Hill County Commissioners Court
Local Organization

By Tommy Walker
Title County Judge
Date 9-20-95

The signing of this agreement was authorized by a resolution of the governing body of the Hill County Commissioners Court adopted at a meeting held on Sept. 14, 1995.

Ruth Shelton
(Secretary, Local Organization)

Hill Co. Clerk

Johnson County Soil and Water Conservation District
Local Organization

By Floyd C. Crosby, III
Title Chairman
Date September 11, 1995

The signing of this agreement was authorized by a resolution of the governing body of the Johnson County Soil and Water Conservation District adopted at a meeting held on September 11, 1995.

W.C. Barton
(Secretary, Local Organization)

Johnson County Commissioners Court
Local Organization

By Raymond Hammon
Title County Judge - Johnson County
Date 9-25-95

The signing of this agreement was authorized by a resolution of the governing body of the Johnson County Commissioners Court adopted at a meeting held on 9-25-95.

[Signature]
(Secretary, Local Organization)

Ellis-Prairie Soil and Water Conservation District
Local Organization

By Ernest Lindberg
Title Chairman
Date 9/11/95

The signing of this agreement was authorized by a resolution of the governing body of the Ellis-Prairie Soil and Water Conservation District adopted at a meeting held on 9-11-95.

Lu Hamon
(Secretary, Local Organization)

Ellis County Commissioners Court
Local Organization

By Al Curtis
Title County Judge
Date 9/11/95

The signing of this agreement was authorized by a resolution of the governing body of the Ellis County Commissioners Court adopted at a meeting held on 9-11-95.

Cindy Polley
(Secretary Local Organization)

City of Ennis
Local Organization

By [Signature]
Title City Mgr.
Date Aug 28 1995

The signing of this agreement was authorized by a resolution of the governing body of the City of Ennis adopted at a meeting held on July 3, 1995.

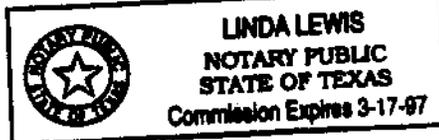
[Signature]
(Secretary, Local Organization)

City of Alvarado, Texas
Local Organization

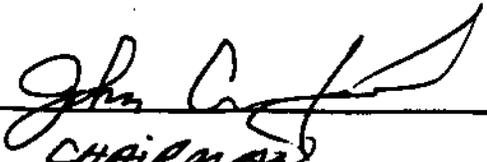
By [Signature]
Title Mayor Pro Tem
Date 9-11-95

The signing of this agreement was authorized by a resolution of the governing body of the City of Alvarado, Texas adopted at a meeting held on 9-11-95.

[Signature]
(Secretary, Local Organization)



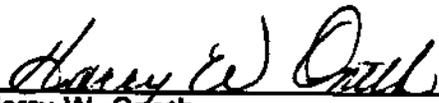
**Dalworth Soil and Water Conservation District
Local Organization**

By 
Title CHAIRMAN
Date 9/20/95

The signing of this agreement was authorized by a resolution of the governing body of the Dalworth Soil and Water Conservation District adopted at a meeting held on 9-11-95.


(Secretary, Local Organization)

**Natural Resources Conservation Service
United States Department of Agriculture**

Approved By 
Harry W. Orath
State Conservationist

Date 10-11-95

SUPPLEMENTAL WATERSHED PLAN NO. VII

CHAMBERS CREEK WATERSHED, TEXAS

Need For Supplemental Watershed Plan No. VII

Mill Creek 1955 planning conditions no longer exist, and those projected for Mill Creek channel did not materialize. The 1955 Watershed Plan works of improvement included about 19,000 feet of stream channel enlargement and realignment for Mill Creek below State Highway 55. The purpose was to provide flood protection to Mill Creek flood plain, and contain the combined principal spillway flow of 14 floodwater retarding structures in the 1955 Watershed Plan.

The Watershed Plan channel work has not been implemented and is not needed for its planned purposes. Conversely, the need is to restrain currently occurring Mill Creek channel enlargement and stabilize streambanks to prevent further destruction of riparian natural and man-made resources from hydraulic abrasion and gravity erosion.

Recent intense and unusually frequent storms have prolonged durations and increased stream flow volumes. Consequently, concentrated flow erosion in Mill Creek and on adjacent flood plains has increased dramatically. The resulting erosion is manifested by obvious channel incisement, widening, knickpoint movement upstream and lateral head cuts in stream banks.

Mill Creek channel capacity below F.M. Highway 55 and above its confluence with Chambers Creek has greatly increased, and is currently expanding significantly with each major storm event. Currently, measured stream channel top widths vary from 73 to 229 feet, bottom widths from 10 to 70 feet and depths from 17 to 28 feet. Channel gradients range from 0.0006 to 0.0021 foot per foot.

Mill Creek channel banks below F.M. Highway 55 are significantly affected by gravity erosion (mass wasting). Channel incisement, excessive moisture content in modern alluvial channelbank soils and lack of adequate riparian vegetation are the major factors allowing mass wasting of Mill Creek and tributary channel banks.

Channel enlargement from mass wasting and hydraulic abrasion are destroying productive flood plain cropland and pastureland. Within 25 years, an estimated 26 acres of land will be eroded away, and an additional 49 acres will be inaccessible and unusable for agricultural production.

Current sediment concentrations in 2.20 inches of average annual watershed runoff at the confluence of Mill Creek and Chambers Creek is 3,900 parts per million (ppm) and is expected to increase to 4,600 ppm without channelbank stabilization measures and other needed watershed conservation measures.

Accelerated channel and streambank erosion is destroying mature riparian elm, pecan and oak hardwoods, and associated understorey woody vegetation along approximately 2.5 miles of Mill Creek and tributaries below State Highway 55. This destruction increases the erodibility of the channel banks, decreases the quantity and quality of wildlife habitat and requires additional capital outlay for removing debris from bridges and road crossings.

Stream channel knickpoints and overfalls moving upstream in a Mill Creek tributary are a potential threat to Floodwater Retarding Structure No.104A. It has been necessary to move a barn to avoid its destruction on another tributary. Pecan Creek tributary is also experiencing erosion that will ultimately destroy riparian vegetation and require additional county road maintenance and bridge construction.

Navarro County also maintains two bridges that cross Mill Creek. Erosion around the bridges' pilings and abutments has necessitated extensive repair or reconstruction. Trees and large understory vegetation eroded from upstream riparian areas create a hazard. Vegetative debris accumulates around pilings, degrading the bridges structural integrity and jeopardizing public safety.

Channel and streambank erosion is a threat to a portion of State Highway 55 and the bridge crossing Mill Creek. Channel incisement has exhumed bridge pilings and footings, and continued erosion around the abutments will compromise the bridge's load bearing capacity.

Description of Supplemental Work Plan No.VII Works of Improvement

Bioengineering

Biological, ecological and mechanical concepts are combined in soil bioengineering. Bioengineering works of improvement are combined with engineering structures, or may be established unilaterally. Bioengineering utilizes live plant materials, usually woody species, as reinforcements, drains, and barriers to inhibit or prevent soil erosion. Plant materials are established at strategic locations to repair and stabilize slope failures.

Approximately 196 acres of channel banks and riparian areas are subject to establishment of willow, hackberry, pecan, oak, ash, dogwood, sumac and wild plum species. Woody vegetation will also be planted in conjunction with structural works of improvement to suppress erosion on areas disturbed during construction.

Structures - Gabion Chutes

A gabion chute is an open-flow structure constructed within and at a normal angle to the stream channel. The structure is comprised of box-shaped wire mesh baskets filled with stone and placed end to end, side by side and one on top of the other to achieve design lengths, widths and elevations. The baskets are laced together to effect a flexible monolithic structure. Aprons of similar materials are constructed at the base of the gabion chute for upstream and downstream erosion protection.

Seven gabion chutes are included in the works of improvement. Four are planned in Mill Creek and one structure in each of three tributaries. The structures planned in Mill Creek are designed to decrease stream channel gradients, which will control stream channel incisement and bank erosion. Gabion chutes constructed in the Mill Creek tributaries will also limit channel incisement and bank erosion, and prevent upstream knickpoint and overfall migration.

Resources Affected by Works of Improvement

Soil

Adverse impacts or conversion of important farmland is not anticipated. The current accelerated rates of channel incisement and channel bank erosion will be adequately suppressed or prevented. Amelioration of current and projected erosion conditions will prevent the distruction or severe damage to the productive capability of an estimated 75 acres of pastureland and cropland.

Current and projected sediment damages to floodpain soils are minimal or insignificant. Therefore, planned works of improvement sediment reduction effects were not estimated.

Water

Sediment concentrations in future watershed runoff will be reduced. Average annual concentration in 2.2 inches of watershed runoff at the confluence of Mill Creek and Chambers Creek will be reduced from an estimated 4,600 parts per million (ppm) to 4,100 ppm, a 500 ppm reduction. Estimated concentration in runoff from a one percent chance storm will be reduced from 2,000 ppm to 1,900 ppm, a 100 ppm reduction.

Effects on Richland-Chambers Reservoir storage capacity (water quantity) are discussed on page 18.

Air

Significant long-term impacts, adverse or positive, on air quality are not anticipated. However, it is possible dust concentrations in the vicinity of structure construction sites will increase on the short-term. This will be an ephemeral effect, subject to the duration of construction activities. With completion of the structure, airborne dust will return to normal preconstruction concentrations.

Plants and Animals

A biological evaluation was made on the works of improvement to be installed in Mill Creek, its tributaries and riparian areas. The evaluation indicated federally listed threatened or endangered plants or animals will not be affected, and critical habitat is not present. It was concluded that long-term adverse impacts will not be caused by installation of the works of improvement. Short-term habitat effects, however, will include the destruction of an estimated four acres of riparian woody vegetation for construction of three of the seven planned gabion chutes. Mitigation will be accomplished by establishing selected woody species for specific habitat needs on or near the sites after construction.

The works of improvement, when installed as planned, will protect existing riparian habitat and restore a minimum of 17 acree of habitat destroyed by stream bank erosion. Gabion chutes will significantly reduce stream channel eroeion and enlargement, thus protecting existing riparian vegetation and habitat destruction or damages. Bioengineering vegetative species will be established to protect channel banks and riparian areas where erosion is most severe and where existing high quality habitat is threatened.

Wildlife Resources: Since the project is located in a predominantly cropland and pastureland area, habitats for wildlife are very limited. However, the pasturelands provide limited habitats for openland wildlife.

The limited riparian zone along Mill Creek provide habitats for small mammals such as rabbits, squirrel, raccoon, fox, and coyotes. Numerous song birds also utilize the area.

Biological Evaluation: An evaluation was made of the wildlife resources associated with the areas to be impacted by the works of improvement to be installed along Mill Creek, its tributaries and riparian zone.

The NRCS invited the following agencies to participate in the review:

- U.S. Fish and Wildlife Service (USF&W)
- U.S. Army Corps of Engineers (COE)
- U.S. Environmental Protection Agency (EPA)
- Texas Parks and Wildlife Department (TP&W)
- Texas Natural Resource Conservation Commission (TNRCC)

Only two agencies, the COE and TNRC choose to participate in the field review.

Following the field review it was concluded:

1. There would be no long-term adverse impacts caused by inettallation of the project.
2. Short-term effects on the wildlife habitat will include the loss of approximately four acres of riparian vegetation
3. Mitigation of the habitat losses will be accomplished by establishing selected wood trees and shrubs that have wildlife food and/or cover values, in proximity to the disturbed areas.
4. Plant species selected for the bioengineering plantings, will help stabilize the streambanks and create riparian habitats for wildlife. The riparian zone will also reduce the silt load going into the stream. Approximately 196 acres along Mill Creek are eligible for these types of plantings.
5. Installation of the project will have no adverse impact on any federally listed threatened or endangered species. According to correspondence with the USF&W the endangered bald eagle and whooping crane have been known to migrate through the project area. However, no habitats are present for either species.
6. Installation of the project will have a positive impact on wildlife resources associated with the area.

Human

Richland-Chambers Reservoir: Future estimated average annual deposition of sediment derived from Mill Creek drainage area is 39.7 acre-feet. The planned works of improvement are expected to reduce this future annual volume to 37.2 acre-feet, a 2.5 acre-foot reduction. Deposition originating in Mill Creek drainage area from a one percent chance storm under projected conditions without Supplement No.VII works of improvement is estimated to be 69.5 acre-feet. Deposition of 67.2 acre-feet is expected with the works of improvement installed, a reduction of 2.3 acre-feet.

Conservation Measures: Destruction or threatened status of terraces, grade control structures and Floodwater Retarding Structure No.104A will be prevented or adequately alleviated, respectively.

Private Income: Prevention of destruction and and curtailment of damages to the productive capability of floodplain soils will enhance local agricultural income. Potential monetary requirements for replacement or repair of terraces and grade control structures due to overfall erosion will be drastically reduced.

County and State Roads-Bridges: Personnel, machinery and materials for maintenance on two county bridges and the State Highway 55 bridge will be significantly decreased. In addition to structural repair, necessary removal and clearing of large debris from abutments and pilings will be curtailed.

Cultural Resources: NRCS activities for protection and preserving cultural resources will include a cultural resource specialist conducting a complete detailed survey prior to construction to determine if any cultural resources exist within the proposed work areas. If any significant cultural resources are found during the survey that will be affected by project works of improvement, NRCS will take appropriate actions for mitigation or preservation.

Installation of Works of Improvement

All applicables federal and state statutory mandates will be adhered to in design and installation of bioengineering and structural works of improvement. All required consultation with federal, state, and local agencies and affected individuals will be accomplished; and all easements and land rights, permits and letters of concurrence will be secured prior to installation and construction.

Construction contracts will implement strict standards controlling soil erosion and water and air pollution during construction. Erosion control measures will be specified for the work site and will include, as applicable, use of temporary vegetation, mulches, diversions, mechanical retardation of runoff and sediment traps. Dust and other pollutants inherent to construction operations will be held to minimum practical limits. Provisions will be made to protect against potential pollutants such as fuel, lubricants, and chemicals. Clearing and disposal of vegetation will be carried out in accordance with applicable laws and regulations.

The gabion chute construction sites will be monitored for newly exposed cultural resources during construction. If any cultural resources are discovered, NRCS will notify the State Historic Preservation Officer and will take appropriate actions to protect any significant cultural resources and avoid adverse effects.

**MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)**

SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO.VII

Table 1 ESTIMATED INSTALLATION COST

WORKS of IMPROVEMENT	UNIT	NUMBER	ESTIMATED COST		TOTAL
			PL-534 Funds Nonfederal Land (dollars)	Other Funds Nonfederal Land (dollars)	
NONSTRUCTURAL					
Bioengineering	Acre	196	1,633,300	--	1,633,300
STRUCTURAL					
Gabion Chutes	No.	7	1,073,700	--	1,073,700
OTHER COSTS					
Easements and Rights of Way			--	33,700	33,700
INSTALLATION SERVICES					
NRCS Engineering Services			105,400	--	105,400
Project Administration			80,100	500	80,600
Subtotal			185,500	500	186,000
TOTAL			2,892,500	34,200	2,926,700

**MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)**

**SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO.VII
ESTIMATED COST DISTRIBUTION
NONSTRUCTURAL AND STRUCTURAL MEASURES**

Table 2

WORKS of IMPROVEMENT	INSTALLATION COSTS, PL-534				INSTALLATION COSTS, OTHER FUNDS			TOTAL INSTALLATION COSTS (dollars)
	Construction (dollars)	Engineering (dollars)	Project Administration (dollars)	Total PL-534 (dollars)	Land Rights (dollars)	Project Administration (dollars)	Total Other (dollars)	
NONSTRUCTURAL								
Bioengineering	1,633,300	---	4,000	1,637,300	20,000	500	20,500	1,657,800
STRUCTURAL								
Gabion Chute No.								
M 1	217,200	17,400	13,000	247,600	2,200	---	2,200	249,800
M 2	175,400	16,700	12,300	204,400	2,200	---	2,200	206,600
M 3	192,300	16,300	13,500	224,100	2,200	---	2,200	226,300
M 4	208,500	16,700	12,500	237,700	2,200	---	2,200	239,900
M 5	113,600	12,500	3,100	135,200	1,900	---	1,900	137,100
M 6	68,600	11,000	6,900	86,500	1,700	---	1,700	88,200
M 7	98,100	12,800	8,600	119,700	1,300	---	1,300	121,000
Subtotal	1,073,700	105,400	76,100	1,255,200	13,700	---	13,700	1,268,900
TOTAL	2,707,000	105,400	80,100	2,892,500	33,700	500	34,200	2,926,700

Price base: 1995

August, 1995

**MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)**

**Table 3b
STRUCTURAL DATA, GABION CHUTES**

MILL CREEK, CONFLUENCE WITH CHAMBERS CREEK TO F.M. HIGHWAY 55										
Gabion Chute Structure No.	Fall Removed (feet)	Widths		Side Slopes	Depth (Average) (feet)	Gabion Chute Grade	Elevations		Rock Gabions (cubic yards)	
		Bottom (feet)	Top (feet)				Bottom (msl)	10-Year Storm (msl)		
M 1	5.0	30.0	168.0	2.5 : 1	24.0	10 : 1	366.0	374.0	397.3	857
M 2	5.0	30.0	133.0	2.5 : 1	17.0	10 : 1	365.8	390.6	408.0	712
M 3	5.0	30.0	140.5	2.5 : 1	18.5	10 : 1	397.6	402.6	420.6	742
M 4	6.0	30.0	130.5	2.5 : 1	16.5	10 : 1	404.5	412.5	422.5	804
M 5	6.0	8.0	74.0	2.0 : 1	12.0	10 : 1	406.0	398.0	408.3	474
M 6	8.0	6.0	64.0	1.5 : 1	9.5	3 : 1	409.0	417.0	421.5	260
M 7	8.0	20.0	66.0	2.0 : 1	10.0	3 : 1	412.0	420.0	II	384

II Flow Controlled by F.M. Highway 55

August, 1985

MILL CREEK
 CHAMBERS CREEK WATERSHED
 TRINITY RIVER WATERSHED (WF-03)
 SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO.VII

**Table 3c
 CHANNEL MORPHOLOGY AND STREAM FLOW DATA**

Valley Section	Drainage Area (sq.m.)	Channel Dimensions			Manning's "n" Value		Velocities		Side Slopes	
		Bottom Width (ft.)	Side Slopes (average)	Bottom Elevation (msl)	Channel Present	Channel Bottom W/Supplement VII	Channel Present (ft./sec.)	Channel Bottom W/Supplement VII (ft./sec.)	Channel Present (ft./sec.)	Channel Bottom W/Supplement VII (ft./sec.)
1	109.4	28	2.7 : 1	367.5	0.050	0.080	5.44	5.44	2.09	2.09
2	108.7	20	2.2 : 1	368.1	0.035	0.060	7.85	8.01	2.66	2.33
3	106.4	15	2.4 : 1	374.9	0.030	0.040	7.05	5.78	2.91	1.43
4	107.9	18	1.7 : 1	378.8	0.030	0.040	8.85	7.69	4.20	2.18
5	107.3	22	2.7 : 1	381.2	0.030	0.035	7.18	5.70	3.06	1.46
6	106.6	10	1.2 : 1	381.4	0.030	0.040	10.04	8.64	3.69	1.87
7	106.1	10	1.3 : 1	383.0	0.030	0.040	8.89	7.84	3.51	1.92
8	105.6	30	1.7 : 1	385.5	0.030	0.035	8.74	10.13	4.35	1.97
9	105.3	32	2.2 : 1	385.8	0.030	0.035	7.38	6.64	3.60	1.55
10	100.0	50	2.1 : 1	390.1	0.050	0.050	8.02	7.59	2.37	2.28
11	108.4	30	3.2 : 1	391.6	0.050	0.050	8.18	7.85	2.88	2.76
12	99.8	35	1.8 : 1	395.5	0.050	0.050	7.78	7.59	2.70	2.63
13	98.5	65	3.7 : 1	399.5	0.050	0.040	5.02	4.59	1.83	1.67
14	89.0	30	1.5 : 1	404.8	0.050	0.050	8.76	4.43	3.64	1.47
15	88.7	25	1.4 : 1	403.8	0.050	0.050	10.57	4.61	2.88	2.67
16	88.7	70	2.1 : 1	405.4	0.050	0.050	6.93	4.14	2.80	1.70
17	88.6	28	1.8 : 1	410.4	0.050	0.065	6.60	5.01	1.54	1.22
18	88.4	25	1.5 : 1	407.4	0.050	0.065	5.08	4.69	1.86	1.55

August, 1986

MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)
SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO.VII

Table 4 ANNUALIZED ADVERSE NED EFFECTS

EVALUATION UNITS	SUPPLEMENT NO.VII OUTLAY		TOTAL COST (dollars)
	Amortization of Installation Cost (dollars)	Operation, Maintenance and Replacement Cost (dollars)	
NONSTRUCTURAL MEASURES Bioengineering	55,800	30,000	85,800
STRUCTURAL MEASURES Gabion Chutes (7)	43,000	3,500	46,500
TOTAL	98,800	33,500	132,300

Price Base 1994, discounted at 3.25 % for 100 years. August, 1995

MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)
SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO. VII

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Table 5 ESTIMATED AVERAGE ANNUAL DAMAGE REDUCTION BENEFITS

ITEM	DAMAGES (dollars)				DAMAGE REDUCTION (dollars)	
	Without Supplement No. VII		With Supplement No. VII		Agricultural	Nonagricultural
	Agricultural	Nonagricultural	Agricultural	Nonagricultural		
EROSION Streambank Valley Trenching Road & Bridge Subtotal	21,200	---	4,200	---	17,000	---
	22,800	---	6,800	---	16,000	---
	---	114,200	---	11,900	---	102,300
	44,000	114,200	11,000	11,900	33,000	102,300
SEDIMENT Richland-Chambers Reservoir	---	13,400	---	12,500	---	900
	5,700	28,600	2,400	3,000	33,000	25,600
TOTAL	49,700	156,200	13,400	27,400	36,300	128,600

Price base 1994

August, 1995

**MILL CREEK
CHAMBERS CREEK WATERSHED
TRINITY RIVER WATERSHED (WF-03)
SUPPLEMENTAL WATERSHED PLAN AND AGREEMENT NO.VII**

Table 6 COMPARISON OF NED BENEFITS AND COSTS

EVALUATION UNIT	AGRICULTURAL		NONAGRICULTURAL		BENEFITS Average Annual (dollars)	COSTS Average Annual (dollars)	BENEFIT / COST RATIO
	Damage Reduction (dollars)		(dollars)				
	Erosion	Sediment	Erosion	Sediment			
NONSTRUCTURAL MEASURES Bioengineering	14,600	0	40,800	300	55,700	85,800	0.6 / 1.00
STRUCTURAL MEASURES Gabion Chutes	21,700	0	87,100	600	108,400	46,500	2.4 / 1.00
TOTAL	36,300	0	127,900	900	165,100	132,300	1.2 / 1.00

Price base 1994, discounted at 3.25 % for 100 years.

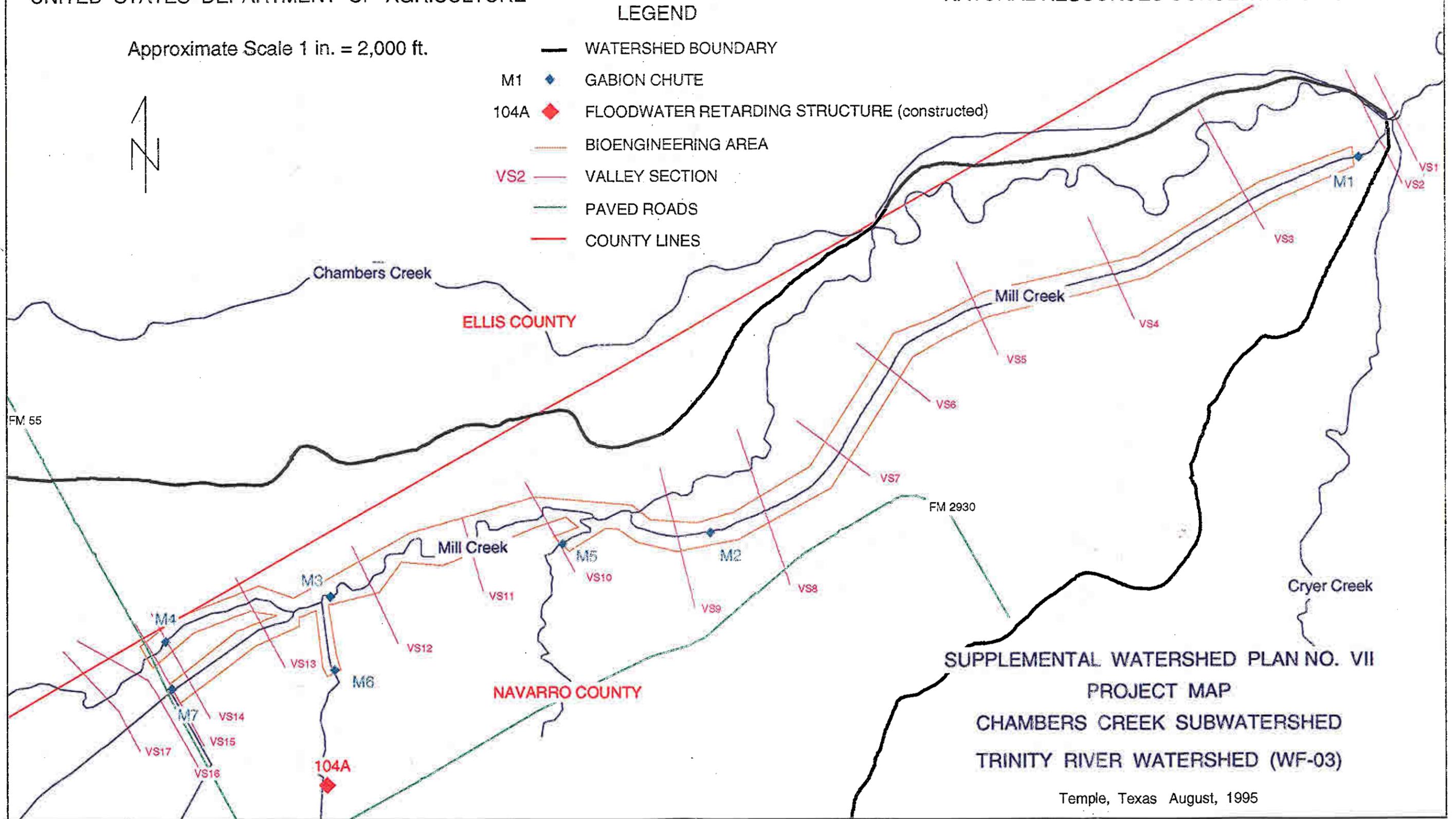
August, 1995

Approximate Scale 1 in. = 2,000 ft.



LEGEND

- WATERSHED BOUNDARY
- M1 ◆ GABION CHUTE
- 104A ◆ FLOODWATER RETARDING STRUCTURE (constructed)
- BIOENGINEERING AREA
- VS2 — VALLEY SECTION
- PAVED ROADS
- COUNTY LINES



SUPPLEMENTAL WATERSHED PLAN NO. VII
 PROJECT MAP
 CHAMBERS CREEK SUBWATERSHED
 TRINITY RIVER WATERSHED (WF-03)

Temple, Texas August, 1995

