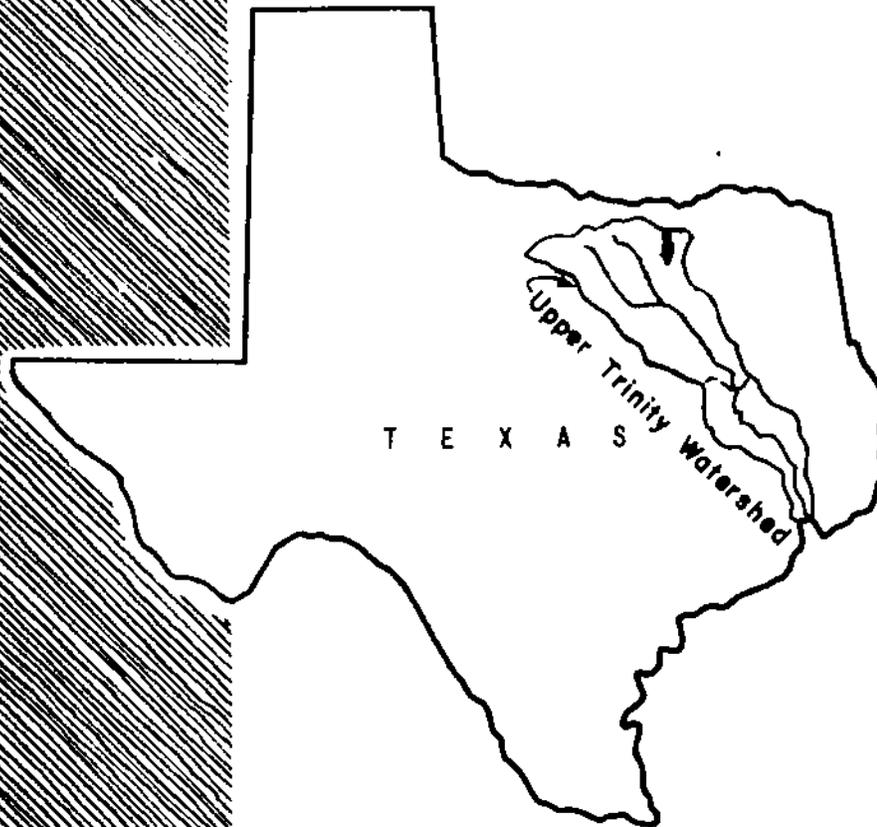


SUPPLEMENTAL
WORK PLAN II

EAST FORK ABOVE LAVON
WATERSHED

OF THE TRINITY RIVER WATERSHED
COLLIN AND GRAYSON COUNTIES, TEXAS



Prepared By
SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
Temple, Texas
September 1971

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SUPPLEMENTAL WATERSHED WORK PLAN AGREEMENT NUMBER II

Between the

Collin County Soil and Water Conservation District
Local Organization

Upper Elm-Red Soil and Water Conservation District
Local Organization

Collin County Commissioners Court
Local Organization

Grayson County Commissioners Court
Local Organization

City of Van Alstyne
Local Organization

City of Anna
Local Organization

State of Texas
(hereinafter referred to as the Sponsoring Local Organization)

and the

Soil Conservation Service
United States Department of Agriculture
(hereinafter referred to as the Service)

Whereas, the Watershed Work Plan Agreement for East Fork Above Lavon Watershed, State of Texas, executed by the Sponsoring Local Organization named therein and the Service, became effective on the 12th day of September 1956; and

Whereas, the Supplemental Watershed Work Plan Agreement for East Fork Above Lavon Watershed, State of Texas, executed by the Sponsoring Local Organization named therein and the Service, became effective on the 1st day of December 1964; and

Whereas, in order to carry out the watershed work plan for said watershed, it has become necessary to modify said Watershed Work Plan Agreement, as supplemented; and

Whereas, it has been found necessary to modify the watershed work plan as supplemented by deleting Floodwater Retarding Structure No. 38A and Multiple-Purpose Structure No. 41, and adding Multiple-Purpose Structure No. 41A; and

Whereas, the City of Anna, Texas will benefit from the installation of Multiple-Purpose Structure No. 41A, and now therefore agrees to become a Sponsoring Local Organization of said watershed project; and

Whereas, the Cities of Van Alstyne and Anna, Texas further agree to share equally all local costs required for the installation, operation and maintenance of Multiple-Purpose Structure No. 41A; and

Whereas, it has been found necessary to modify the watershed work plan, as supplemented to reflect current policy and terminology relative to engineering and project administration costs; and

Whereas, a Supplemental Watershed Work Plan No. II which modifies the Watershed Work Plan dated August 1956, and the Supplemental Watershed Work Plan dated September 1963, for said watershed has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service; which plan is annexed to and made a part of this agreement; and

Now, therefore, the Sponsoring Local Organization and the Service agree upon the following modifications of the terms, conditions, and stipulations of said Supplemental Watershed Work Plan Agreement:

1. Paragraph numbered 1 is modified with respect to Multiple-Purpose Structure Nos. 41 and 41A to read as follows:

Except as herein provided, the Sponsoring Local Organization will acquire without cost to the Federal Government such land rights as will be needed in connection of Multiple-Purpose No. 41A (Estimated cost \$534,380). The percentages of this cost to be borne by the Sponsoring Local Organization and the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Land Rights Cost</u> (dollars)
<u>Multiple-Purpose Structure No. 41A and Recreational Facilities</u>			
Payments to Landowners for about 808 acres and costs of moving or modification of improvements.	55.70	44.30	484,800
Legal fees, survey costs, flowage easements, and other.	100.00	-	49,580

2. A paragraph is added to read as follows:

The Sponsoring Local Organization will provide relocation advisory assistance services and make the relocation payments to displaced persons as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646 84th Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. Prior to July 1, 1972, the Sponsoring Local Organization will comply with the real property acquisition policies contained in said Act and Regulations to the extent that they are legally able to do so in accordance with their State law. After July 1, 1972, the real property acquisition policies contained in said Act shall be followed in all cases.

The Service will bear 100 percent of the first \$25,000 of relocation payment costs for any person, business, or farm operation displaced prior to July 1, 1972. Any such costs for a single dislocation in excess of \$25,000 and all costs for relocation payments for persons displaced after July 1, 1972, will be shared by the Sponsoring Local Organization and the Service as follows:

	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Relocation Payment Cost</u> (dollars)
Relocation Payments	33.27	66.73	0 ^{1/}

^{1/} Investigations have disclosed that under current conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages shown above.

3. Paragraph numbered 3 is modified with respect to Multiple-Purpose Structure Nos. 41 and 41A to read as follows:

The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Construction Cost</u> (dollars)
Multiple-Purpose Structure 41A	29.98	70.02	274,720
Basic Recreational Facilities	50.00	50.00	210,200
Water Intake Structure	100.00	-	19,520

4. Paragraph numbered 4 is modified with respect to Multiple-Purpose Structure Nos. 41 and 41A to read as follows:

The percentages of the engineering costs to be borne by the Sponsoring Local Organization and the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimated Engineering Costs</u> (dollars)
Multiple-Purpose Structure 41A A and E Contract	24.47	75.53	15,380
Basic Recreational Facilities A and E Contract	50.00	50.00	10,520
Water Intake Structure	100.00	-	2,730

5. The Sponsoring Local Organization and the Service will each bear the costs of Project Administration which it incurs, estimated to be \$2,900 and \$969,510 respectively, for the total project installation.
6. A paragraph is added to read as follows:

The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the regulations of the Secretary of Agriculture (7C.F.R. 15.1-15.12), which provides that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving Federal financial assistance.

7. The Sponsoring Local Organization and the Service further agree to all other terms, conditions, and stipulations of said Watershed Work Plan, as supplemented, not modified herein.

Collin County Soil and Water Conservation District
Local Organization

By John D. Wells
Title Chairman
Address Plano 75074
Date 7/11/72 Zip code

The signing of this agreement was authorized by a resolution of the governing body of the Collin County Soil and Water Conservation District Local Organization adopted at a meeting held on 7/11/72

B. Bailey
(Secretary, Local Organization)
Address Leander 75452
Date 7/11/72 Zip Code

Upper Elm-Red Soil and Water Conservation District
Local Organization

By J. Payer
Title Chairman
Address Rt. 3 Muenster 76252
Date 9-13-72 Zip Code

The signing of this agreement was authorized by a resolution of the governing body of the Upper Elm-Red Soil and Water Conservation District Local Organization adopted at a meeting held on 9-13-72

W. J. City
(Secretary, Local Organization)
Address P.O. Box 1234 Sherman 75090
Date 9-13-72 Zip Code

Collin County Commissioners Court
Local Organization

By *[Signature]*

Title County Judge

Address McKinney, Tx. 75069

Date 8-7-72 Zip code

The signing of this agreement was authorized by a resolution of the governing body of the Collin County Commissioners Court Local Organization adopted at a meeting held on 8-7-72

[Signature]
(Secretary, Local Organization)

Address McKinney, Texas 75069

Date 8-7-72 Zip Code

Grayson County Commissioners Court
Local Organization

By *[Signature]*

Title County Judge

Address Sherman, Texas 75090

Date 8-17-72 Zip Code

The signing of this agreement was authorized by a resolution of the governing body of the Grayson County Commissioners Court Local Organization adopted at a meeting held on 8-17-72

[Signature]
(Secretary, Local Organization)

Address Sherman, Texas 75090

Date 8-17-72 Zip Code

City of Van Alstyne
Local Organization

By *[Signature]*
Title Mayor

Address Van Alstyne, Texas 75095
Zip Code

Date June 21, 1972

The signing of this agreement was authorized by a resolution of the governing body of the City of Van Alstyne Local Organization adopted at a meeting held on June 21, 1972

Milton G. Cadenhead
Acting (Secretary, Local Organization)

Address Van Alstyne, Texas 75095
Zip Code

Date June 21, 1972

City of Anna
Local Organization

By *Bill Powell*
Title Mayor

Address Anna, Texas 75003
Zip Code

Date June 21, 1972

The signing of this agreement was authorized by a resolution of the governing body of the City of Anna Local Organization adopted at a meeting held on June 21, 1972

Charles E. White
Acting (Secretary, Local Organization)

Address Anna, Texas 75003
Zip Code

Date June 21, 1972

Soil Conservation Service
United States Department of Agriculture

By *[Signature]*
(State Conservationist)

Date 9/19/72

SUPPLEMENTAL

WATERSHED WORK PLAN NUMBER II

EAST FORK ABOVE LAVON WATERSHED
Of the Trinity River Watershed
Collin and Grayson Counties, Texas

Plan Prepared and Works of Improvement
to be Installed Under the Authority
of the Flood Control Act of 1944
as Amended and Supplemented

Prepared By:

Collin County Soil and Water Conservation District
Upper Elm-Red Soil and Water Conservation District
City of Van Alstyne, Texas
City of Anna, Texas
Grayson County Commissioners Court
Collin County Commissioners Court

With Assistance By:

U. S. Department of Agriculture
Soil Conservation Service

September 1971

SUPPLEMENTAL

WATERSHED WORK PLAN NUMBER II

EAST FORK ABOVE LAVON WATERSHED
Of the Trinity River Watershed
Collin and Grayson Counties, Texas

September 1971

PURPOSE OF THE SUPPLEMENTAL WATERSHED WORK PLAN

The purpose of this supplemental watershed work plan for the East Fork Above Lavon watershed is to modify the watershed work plan, as supplemented, to relocate multiple-purpose structure No. 41, increase the storage for municipal and recreational water for the City of Van Alstyne, Texas, and to provide storage of municipal and recreational water for the City of Anna, Texas. The relocation of multiple-purpose structure No. 41, which is hereinafter referred to as multiple-purpose structure No. 41A, eliminated the need for floodwater retarding structure No. 38A, which is therefore deleted from the watershed work plan, as supplemented.

In order to simplify the cost sharing for installation of structural measures, it is also necessary to modify the watershed work plan, as supplemented, to reflect current policy and terminology relative to engineering and project administration costs.

The following are changes and modifications made in appropriate parts of the watershed work plan, as supplemented.

WORKS OF IMPROVEMENT TO BE INSTALLED

Land Treatment

The sponsors of the project recognize an effective conservation program is essential to a sound continuing program of flood prevention and watershed protection. Continued emphasis will be placed on establishing land treatment measures which will have a measurable effect on reducing floodwater and sediment damages.

Those measures that have been established in the watershed and their estimated cost are shown in table 1A. Table 1 lists by land use the revised total acres on which land treatment measures will be installed during the installation period.

Structural Measures

Multiple-purpose structure No. 41 and floodwater retarding structure No. 38A will be deleted and replaced by multiple-purpose structure No. 41A.

SUPPLEMENTAL

WATERSHED WORK PLAN NUMBER II

EAST FORK ABOVE LAVON WATERSHED
Of the Trinity River Watershed
Collin and Grayson Counties, Texas

September 1971

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Those measures that have been established in the watershed and their estimated cost are shown in table 1A. Table 1 lists by land use the revised total acres on which land treatment measures will be installed during the installation period.

Structural Measures

Multiple-purpose structure No. 41 and floodwater retarding structure No. 38A will be deleted and replaced by multiple-purpose structure No. 41A.

The multiple-purpose structure has a total storage capacity of 6,987 acre-feet of which 1,710 acre-feet are for municipal water supply and 770 acre-feet are for recreation. The surface area of the recreation pool is 213 acres. An additional 92 surface acres will be available for recreation use at the maximum elevation of the municipal water supply pool.

The land area above the maximum flow line of the reservoir to be purchased for development and use as the basic recreation and facility area is 120 acres. An additional area of 383 acres between the water supply pool and the fee-simple taking line will also be used for public recreation activities as water levels permit. Flowage easements will be acquired on 11 acres of land that will not be dedicated for recreational use.

Basic recreational facilities will be installed in association with multiple-purpose structure No. 41A. Kinds and numbers of facilities to be installed are shown in table 2B. All facilities in which federal cost sharing is involved will be designed and constructed to assure accessibility and usability by physically handicapped people in accordance with Public Law 90-480.

The embankment of the multiple-purpose structure will be protected from wave action by the placement of rock riprap on the upstream embankment slope from mean sea level elevation 666.0 to 675.0.

Under present conditions, the installation of multiple-purpose structure No. 41A and the other remaining structural measures will not result in the displacement of any persons, businesses or farm operations.

EXPLANATION OF INSTALLATION COSTS

Joint construction and installation services costs for the multiple-purpose structure No. 41A are allocated by the Use of Facilities method, as follows:

<u>Purpose</u>	<u>Acre-Feet</u>	<u>Percentages</u>
Flood Prevention	4,507 <u>1/</u>	64.51
Recreation	770	11.02
Municipal	<u>1,710</u>	<u>24.47</u>
Total	6,987	100.00

1/ Includes 899 acre-feet of sediment storage.

All costs of legal fees and land rights except flowage easements required for the multiple-purpose structure No. 41A are allocated between municipal water supply and recreation. The percentage allocated to recreation is determined on the basis of the total area required for the dam and reservoir (688 acres) minus the reservoir area for the municipal water supply (92 acres) and divided by the total area for the dam and reservoir (86.63 percent). The remainder, 13.37 percent, is allocated to municipal water supply.

The specific cost of the municipal water outlet structure is allocated to municipal water supply.

Costs of basic recreational facilities and associated land are allocated to recreation as a specific cost.

The \$290,100 joint (construction and engineering) costs are allocated \$30,280 to recreation, \$187,140 to flood prevention, and \$70,980 to water supply. The \$22,250 specific cost for the municipal outlet structure is allocated to water supply. The \$226,600 for basic facilities are allocated to recreation.

The cost for land rights, \$534,380, is allocated \$472,560 to recreation, \$60,720 to water supply, and \$1,100 to flood prevention. The cost for water rights (\$1,500) is allocated \$460 to recreation and \$1,040 to water supply.

The total cost allocated to recreation is \$731,600, to water supply \$154,990, and to flood prevention \$188,240, for a total of \$1,074,830.

Federal funds will not bear any of the costs allocated to municipal water supply, or any legal fees or engineering services necessary to obtain land rights.

For the multiple-purpose structure, Federal funds will bear the construction cost allocated to flood prevention (\$177,220) and 50 percent of that allocated to recreation (\$15,140), all the engineering costs allocated to these two purposes (\$11,620), and 50 percent of the eligible land rights costs (\$214,800) allocated to recreation. The Federal share of basic recreational facilities is 50 percent of construction and engineering services costs (\$113,300). The Federal share of land rights will be 50 percent of the actual payments, not to exceed the fair market values. All costs for flowage easements, legal fees, and survey costs (\$49,580) will be borne by the Cities of Van Alstyne and Anna.

Engineering costs consist of, but are not limited to, detailed surveys, geologic investigations, laboratory analyses, reports, designs, and cartographic services.

Federal project administration costs consist of construction inspection, contract administration, maintenance of Soil Conservation Service State Office records and accounts, and Washington Office and E&WP Unit costs. The local costs for project administration include sponsors' costs relative to contract administration, overhead and organizational costs, and whatever construction inspection the sponsors desire to make at their own expense.

EFFECTS OF WORKS OF IMPROVEMENT AND PROJECT BENEFITS

With the deletion of Sites 38A and 41 and with the addition of Site 41A, the benefited area will be reduced by 23 acres. Annual damage reduction benefits within this area will be reduced approximately \$280. With the increase in drainage area controlled, it is estimated that an additional reduction of two acre-feet of sediment, valued at \$60 annually, in Lavon Reservoir will be realized.

The Cities of Van Alstyne and Anna will realize a saving in the development of their municipal water supply and recreation center by cooperating in the construction of Site No. 41A as a multiple-purpose structure. It is expected that the cities will grow, with an assured water supply, to a population of approximately 7,700 by the year 2020.

Municipal water benefits are considered to equal the estimated cost of the least costly equivalent alternative water supply. The annual benefits are estimated to be approximately \$35,100.

The recreation pool of the multiple-purpose structure, with accompanying minimum basic recreational facilities, will provide opportunity for water-based recreational activities for an estimated 48,000 visitor-days annually. Benefits based on \$1.50 per visitor-day will be \$72,000.

Incidental recreation benefits will be reduced by \$50 with the deletion of Site 38A.

COMPARISON OF BENEFITS AND COSTS

Primary benefits accruing to structural measures for the total project consist of reduction in damages, increase in income from more intensive and changed land use, and benefits from recreation and municipal water. These benefits average \$529,680 annually as compared to the annual cost of \$337,320, giving a benefit-cost ratio of 1.6:1.

Total annual benefits, including secondary benefits, accruing to structural measures amount to \$583,100, giving a benefit-cost ratio of 1.7:1 (table 6).

PROJECT INSTALLATION

Planning and application of land treatment and structural measures will be carried out in accordance with provisions of the watershed work plan, as supplemented.

The installation period for this project is extended through 1976.

All land rights necessary for the installation of multiple-purpose structure No. 41A and basic recreation facilities will be acquired by the Cities of Van Alstyne and Anna. Payments for about 808 acres of land to be acquired in fee-simple title will be shared 44.30 percent by the Federal government and 55.70 percent by the Cities of Van Alstyne and Anna. All costs for legal fees, survey costs, and flowage easements will be borne by the Cities.

The Cities of Van Alstyne and Anna and the Service will enter into agreements for the negotiation of separate architectural and engineering contracts with a private engineering firm to prepare construction plans and specifications for multiple-purpose structure No. 41A and basic recreation facilities.

The Soil Conservation Service will advertise, award and administer contracts and supervise construction of multiple-purpose structure No. 41A and basic recreation facilities.

Technical assistance will be provided by the Soil Conservation Service in review of plans and specifications for multiple-purpose structure No. 41A and basic recreation facilities, and in inspection of construction, preparation of contract payment estimates, final inspection, execution of certification of completion, and related tasks necessary to install the structural measures. The Cities of Van Alstyne and Anna will make whatever inspections they desire at their own expense.

FINANCING PROJECT INSTALLATION

Funds for the local share of the cost of installing multiple-purpose structure No. 41A and basic recreation facilities will be provided by the Cities of Van Alstyne and Anna. All local costs will be shared equally by the two cities.

Multiple-purpose structure No. 41A and basic recreation facilities will be installed pursuant to the following conditions:

1. All land rights have been obtained.
2. Water rights have been obtained.
3. Reimbursable agreements between the Service and the Cities of Van Alstyne and Anna have been executed relative to the share of construction and engineering services costs to be borne by local interests.
4. Federal funds are available.

PROVISIONS FOR OPERATION AND MAINTENANCE

Land Treatment Measures

Land treatment measures will be maintained in accordance with the provisions of the watershed work plan, as supplemented.

Structural Measures

The estimated average annual cost for operation and maintenance of multiple-purpose structure No. 41A is \$600. The estimated average annual operation, maintenance, and replacement cost for the basic recreation facilities is estimated to be \$22,720, of which \$6,690 is for replacement of facilities during the evaluation period.

Specific operation and maintenance agreements will be executed by the Cities of Van Alstyne and Anna and the Service prior to the issuance of any invitation to bid on construction of multiple-purpose structure No. 41A and basic recreation facilities.

With consideration of allocation of evaporation by purpose, the lower operating limit of the municipal water supply pool is elevation 658.7. The Sponsoring Local Organization will notify the Soil Conservation Service, through the State Conservationist, whenever the reservoir is operated below this elevation. The Sponsoring Local Organization will participate with the State Conservationist in determining whether there is a continuing need to so operate the reservoir. If it is found that there is a continuing need for the use of recreation storage for municipal or industrial purposes, the Sponsoring Local Organization agrees to reimburse the Federal government for all Federal funds used for public recreation associated with the reservoir (construction, engineering services, land, and basic facilities).

The Cities of Van Alstyne and Anna will be jointly responsible for operation and maintenance of the multiple-purpose structure and basic recreational facilities in accordance with the provisions specified in the operation and maintenance agreements.

All costs for operation and maintenance will be shared equally by the two Cities. Funds will come from the general funds of the Cities which may include revenues from fees charged in conjunction with use of the recreational development. Admission fees charged by the Cities will be limited to those necessary to amortize the initial investment and provide adequate operation and maintenance.

The Cities of Van Alstyne and Anna will be responsible for and promptly perform, or have performed, without cost to the Service, all maintenance of multiple-purpose structure No. 41A and basic recreation facilities as determined to be needed by either the Cities or the Service immediately following completion of the structure by the contractor.

The Service, the Cities, and the Collin County Soil and Water Conservation District will make a joint inspection of the multiple-purpose structure at least annually or after unusually severe floods or in the event of any other unusual conditions that may adversely affect the structure for three years following installation. Inspection after the third year will be made at least annually by the Cities and the Soil and Water Conservation District. The Service will participate in annual inspections as often as it elects to do so after the third year. Inspections of the basic recreation facilities will be conducted on the same schedule except the facilities will also be inspected by the Cities during the season of heavy useage as often as necessary to prevent deterioration of the facilities.

Provisions will be made for free access of representatives of sponsoring local organizations and Federal representatives to inspect and provide maintenance for structural measures and their appurtenances at any time.

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

Installation Cost Item	Unit	Number	Estimated Cost (Dollars) 1/		
			Federal Funds	Other Funds	Total
LAND TREATMENT					
Soil Conservation Service					
Cropland	Acre	45,340	-	885,000	885,000
Pastureland	Acre	43,130	-	1,110,700	1,110,700
Technical Assistance (Accelerated)			138,520	-	138,520
TOTAL LAND TREATMENT			138,520	1,995,700	2,134,220
STRUCTURAL MEASURES					
Construction					
Soil Conservation Service					
Floodwater Retarding Structures	No.	73	3,020,370	-	3,020,370
Stream Channel Improvement	Mile	37	1,528,100	-	1,528,100
Multiple-Purpose Structure No. 41A	No.	1	192,360	82,360	274,720
Water Outlet Structure	No.	1	-	19,520	19,520
Recreational Facilities	-	-	107,900	107,900	215,800
Subtotal - Construction			4,848,730	209,780	5,058,510
Engineering Services					
Soil Conservation Service			157,220	11,890	369,110
Subtotal - Engineering			357,220	11,890	369,110
Project Administration					
Soil Conservation Service					
Construction Inspection			512,640	1,230	513,870
Other			457,700	1,670	459,370
Subtotal - Administration			970,340	2,900	973,240
Other Costs					
Land Rights			214,800	1,034,550	1,249,350
Water Rights			-	1,500	1,500
Subtotal - Other			214,800	1,036,050	1,250,850
TOTAL STRUCTURAL MEASURES			6,391,090	1,260,620	7,651,710
TOTAL PROJECT			6,529,610	3,256,320	9,785,930

1/ 1971 prices.

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TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

Installation Cost Item	:	:	:	Total Cost (Dollars) <u>1/</u>
Item	:	Unit	:	Applied to Date
<u>LAND TREATMENT</u>				
Conservation Cropping System		Acre		84,650
Contour Farming		Acre		44,112
Crop Residue Use		Acre		21,163
Pasture and Hayland Management		Acre		70,924
Pasture Planting		Acre		23,323
Brush Control		Acre		52,557
Diversion		Foot		695,520
Pond		No.		2,837
Grade Stabilization Structure		No.		67
Grassed Waterway		Acre		3,544
Terrace, Gradient		Foot		8,889,489
Terrace, Parallel		Foot		2,966,491
Total Land Treatment				3,101,180
<u>STRUCTURAL MEASURES</u>				
Floodwater Retarding Structures		No.		63
				3,552,930
<u>GRAND TOTAL</u>				6,654,110

1/ Price Base: 1971 prices for land treatment and actual cost for floodwater retarding structures.

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

Item	Installation Cost - Flood Prevention Funds:			Installation Cost - Other Funds:			Total		
	Construction	Engineering	Land Rights	Construction	Engineering	Land Rights	Construction	Installation Cost	
Floodwater Retarding Structures Constructed - No. (63)	2,366,580	215,310	-	2,581,890	-	433,910	-	433,910	3,015,800
Structures to be Constructed									
1E	80,140	5,610	-	85,750	-	22,930	-	22,930	108,680
6A	61,970	4,340	-	66,310	-	6,650	-	6,650	72,960
6B	96,660	6,770	-	103,430	-	9,500	-	9,500	112,930
8B-1	76,910	5,380	-	82,290	-	14,440	-	14,440	96,730
50	64,740	4,530	-	69,270	-	20,230	-	20,230	89,500
51	34,560	3,460	-	38,020	-	3,750	-	3,750	43,770
52	48,280	3,860	-	52,140	-	6,550	-	6,550	58,690
54A	39,660	3,970	-	43,630	-	7,730	-	7,730	51,360
55	84,740	5,930	-	90,670	-	22,980	-	22,980	113,650
56	66,130	4,630	-	70,760	-	15,400	-	15,400	86,160
Subtotal	653,790	48,480	-	702,270	-	132,160	-	132,160	834,430
Multiple-Purpose Structure No. 41A	192,360	11,620	2/	178,800	82,360	3,760	2/	1,500	364,000
Water Outlet Structure	-	-	-	382,780	19,520	2,730	-	-	746,780
Basin Retentional Facilities	107,900	5,400	2/	36,000	107,900	5,400	2/	43,200	4/
Subtotal	300,260	17,020	2/	214,800	209,780	11,890	319,580	1,500	542,750
Stream Channel Improvement	1,528,100	76,410	-	1,604,510	-	148,900	-	148,900	1,753,410
Subtotal - Watershed	4,848,730	357,220	214,800	5,420,750	209,780	11,890	1,034,550	1,500	6,678,470
Project Administration	-	-	-	970,340	-	-	-	-	973,240
GRAND TOTAL	4,848,730	357,220	214,800	6,391,090	209,780	11,890	1,034,550	1,500	7,651,710

1/ 1971 prices; actual contract cost for structures built prior to July 1, 1970.
 2/ Architectural and Engineering Contract.
 3/ Includes \$41,280 for surveys and legal fees and \$1,100 for flowage easements.
 4/ Includes \$7,200 for surveys and legal fees.

TABLE ZA - COST ALLOCATION AND COST SHARING SUMMARY
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

(Dollars) 1/

Item	COST ALLOCATION PURPOSE				COST SHARING				OTHER
	Flood Prevention	Recreation	Water	Total	Flood Prevention	Recreation	Water	Total	
Single Purpose Flood Prevention Structures	5,603,660	-	-	5,603,660	4,888,670	-	-	4,888,670	-
73 Floodwater Retarding Structures and approximately 37 miles of Stream Channel Improvement	188,240	425,800	132,740	746,780	187,140	195,640	1,100	382,780	230,160
Multiple-Purpose Structure No. 41A	-	305,800	-	305,800	-	149,300	-	149,300	156,500
Basic Recreational Facilities	-	-	22,250	22,250	-	-	-	-	22,250
Water Outlet Structure	-	-	-	-	-	-	-	-	-
GRAND TOTAL	5,791,880	731,600	154,990	6,678,470	5,075,810	344,940	716,070	5,420,750	386,660

1/ Price Base: Actual costs for structures reconstructed prior to July 1, 1970 and 1971 prices for structures remaining to be reconstructed.

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TABLE 2B - RECREATIONAL FACILITIES
ESTIMATED CONSTRUCTION COSTS
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

Multiple-Purpose Structure 41A

(Dollars) 1/

Item	Number	Estimated Unit Cost	Total Construction Cost
1. Site Preparation	Job	L.S.	2,500
2. Roads - Asphalt Surface	5.0 Miles <u>2/</u>	19,000	95,000
3. Parking Lot - 90,000 Square Feet (Rock Base with Gravel Surface) 250 Spaces	90,000 Sq.Ft. <u>2/</u>	0.10	9,000
4. Sanitary Facilities (Pit Toilets - Sealed Vault Type - Concrete Block - 2-Unit)	6 Units	2,000	12,000
5. Electrical and Lighting			
a. Distribution Line	7,200 Feet <u>2/</u>	0.90	6,480
b. Mercury Lights	14 <u>2/</u>	80	1,120
6. Beach Development - W/Diversion			
a. Sand and Gravel (Pit Run)	1,500 Cu.Yds. <u>2/</u>	4	6,000
b. Safety Equipment	Job	L.S.	600
7. Boat Ramps			
a. Concrete	1	2,000	2,000
b. Rock Base W/Gravel Surface	2	600	1,200
c. As Is (Using County Road)	2	-	-
8. Picnic Facilities			
a. Tables and Benches, Concrete	25	150	3,750
b. Cooking Grill	25	60	1,500
c. Concrete Slabs (For Garbage Receiver)	20	25	500
9. Water Supply			
a. 2" Polyethylene Installed	19,100 Feet <u>2/</u>	2.25	42,975
b. Drinking Fountain	7 <u>2/</u>	25	175
10. Vegetative Planting	12 Acres <u>2/</u>	125	1,500
11. Landscaping	Job	L.S.	1,000
12. Fencing	11.0 Miles <u>2/</u>	2,500	27,500
13. Signs	2	500	1,000
GRAND TOTAL			215,800

1/ Price Base: 1971 prices.

2/ Estimated quantity, subject to minor variation at time of detailed planning.

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TABLE 3 - STRUCTURE DATA - FLOODWATER RETARDING STRUCTURE
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

ITEM	UNIT	STRUCTURE NUMBER
		41A
Class of Structure		B
Drainage Area	Sq.Mi.	11.02
Controlled	Sq.Mi.	6.91
Curve No. (1-day) (AMC II)		80
Tc	Hrs.	3.2
Elevation Top of Dam	Ft.	684.9
Elevation Crest Emergency Spillway	Ft.	678.5
Elevation Crest Principal Spillway	Ft.	669.0
Elevation Crest Lowest Ungated Outlet	Ft.	669.0
Maximum Height of Dam	Ft.	57
Volume of Fill	Cu.Yds.	418,400
Total Capacity	Ac.Ft.	6,987
Sediment Pool (Lowest Ungated Outlet) ^{1/}	Ac.Ft.	-
Sediment Submerged 50-Year	Ac.Ft.	817
Sediment Aerated	Ac.Ft.	82
Municipal Water Supply	Ac.Ft.	1,710
Recreation	Ac.Ft.	770
Retarding	Ac.Ft.	3,608
Surface Area		
Sediment Pool (Lowest Ungated Outlet)	Acres	-
Sediment Pool-Principal Spillway Crest	Acres	-
Beneficial Use - Principal Spillway Crest	Acres	305
Retarding Pool	Acres	495
Principal Spillway		
Rainfall Volume (areal) (1-day)	In.	9.23
Rainfall Volume (areal) (10-day)	In.	15.80
Runoff Volume (10-day)	In.	10.15
Capacity (Maximum)	cfs	313
Frequency Operation - Emer. Spillway	% Chance	1.0
Size of Conduit	In.	48
Emergency Spillway		
Rainfall Volume (ESH) (areal)	In.	9.29
Runoff Volume (ESH)	In.	6.84
Type		Veg.
Bottom Width	Ft.	250
Velocity of Flow (V _c)	Ft./Sec.	5.30
Slope of Exit Channel	Ft./Ft.	.02
Maximum Water Surface Elevation	Ft.	679.8
Freeboard		
Rainfall Volume (FH) (areal)	In.	15.71
Runoff Volume (FH)	In.	13.07
Maximum Water Surface Elevation	Ft.	684.9
Capacity Equivalents		
Sediment Volume	In.	1.53
Beneficial Volume	In.	4.22
Retarding Volume	In.	6.14

^{1/} Volume included in Sediment Submerged, 50-Year.

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 September 1971

TABLE 4 - ANNUAL COST
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

(Dollars)

Evaluation Unit	: Amortization of : Installation Cost	: Operation and : Maintenance Cost	: Total
	: <u>1/</u>	: <u>2/</u>	
73 Floodwater Retarding Structures, approxi- mately 37 miles of Stream Channel Improve- ment, Multiple-Purpose Structure No. 41A, and Basic Recreational Facilities	261,350	38,020	299,370
Project Administration	37,950	xxxxxxx	37,950
GRAND TOTAL	299,300	38,020 <u>3/</u>	337,320

1/ Price Base: Actual costs of structures constructed and 1970 prices for structures remaining to be constructed, amortized for 50 years at 3.0 percent except for multiple-purpose structure No. 41A and basic recreational facilities which are amortized for 50 years at 3.25 percent.

2/ Adjusted Normalized Prices

3/ Includes \$22,720 for operation, maintenance, and replacement of basic recreational facilities.

Supplement No. II
 September 1971

TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

(Dollars) 1/

Item	: Estimated Average Annual Damage:		Damage Reduction Benefits
	: Without Project	: With Project	
Floodwater			
Crop and Pasture	231,790	51,910	179,880
Other Agricultural	68,040	9,150	58,890
Nonagricultural (Road and Bridge)	50,430	6,690	43,740
Subtotal	350,260	67,750	282,510
Sediment			
Overbank Deposition	18,160	1,740	16,420
Lavon Reservoir	15,500	8,610	6,890
Subtotal	33,660	10,350	23,310
Erosion			
Flood Plain Scour	9,420	970	8,450
Indirect	39,330	7,900	31,430
TOTAL	432,670	86,970	345,700

1/ Price Base: Long-term as projected by ARS, September 1957.

Supplement No. II
September 1971

TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES
 East Fork Above Lavon Watershed, Texas
 (Trinity River Watershed)

(Dollars)

Item	AVERAGE ANNUAL BENEFITS				Total	Annual Cost	Benefit-Cost Ratio
	More Intensive and Changed Land Use	Recreation	Water	Municipal:Secondary			
73 Floodwater Retarding Structures, approximately 37 miles of Stream Channel Improvement, Multiple-Purpose Structure No. 41A, and Basic Recreational Facilities	330,500	88,430	75,650	35,100	583,100	299,370	1.9:1
Project Administration	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	37,950	xxxxx
GRAND TOTAL	330,500	88,430	75,650	35,100	583,100	337,320	1.7:1

1/ Price Base: Long-term as projected by ARS, September 1957.
 2/ From table 4.
 3/ In addition, it is estimated that land treatment measures will provide annual flood damage reduction benefits of \$15,200.
 4/ Of the amount shown, \$3,650 is attributed to incidental recreation benefits.

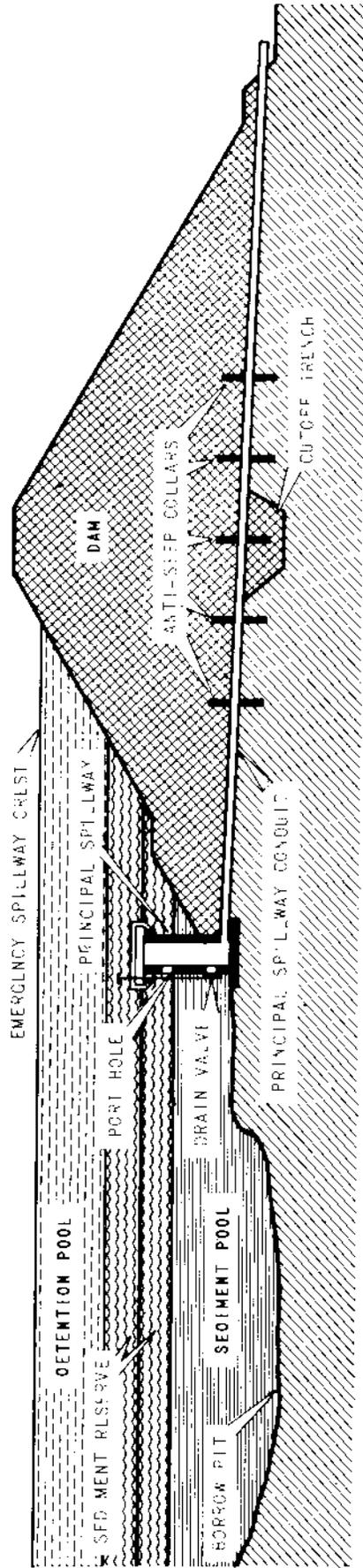


Figure 1

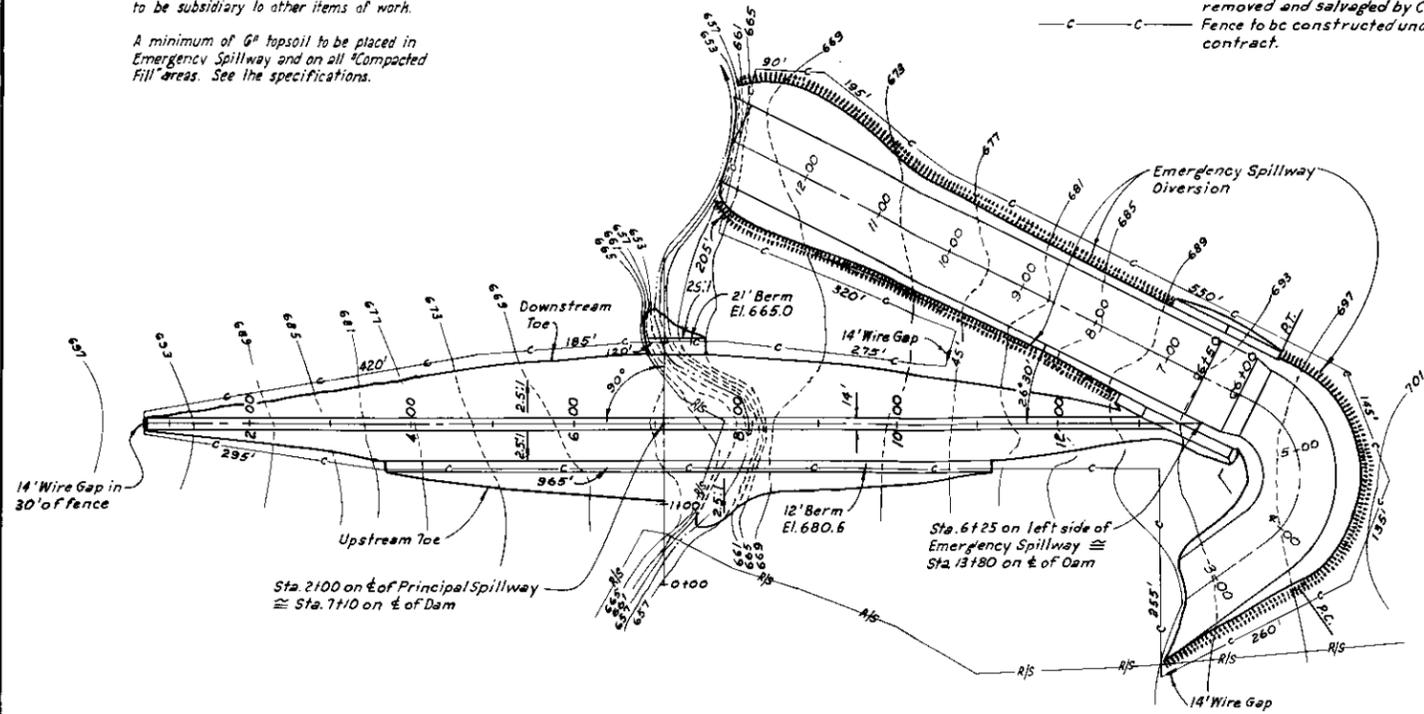
SECTION OF A TYPICAL FLOODWATER RETARDING STRUCTURE

Emergency Spillway Diversion: 18" effective height, 3:1 side slopes, minimum base, 13' Cost of diversion to be subsidiary to other items of work.

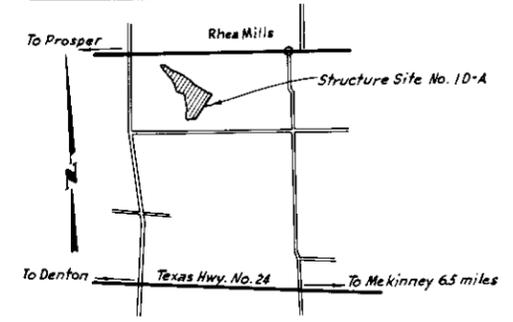
A minimum of 6" topsoil to be placed in Emergency Spillway and on all "Compacted Fill" areas. See the specifications.

FENCE LEGEND

- R/S — R/S — Fence in construction area to be removed and salvaged by Contractor.
- C — C — Fence to be constructed under this contract.

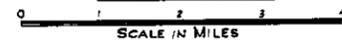


EMERGENCY SPILLWAY CURVE DATA
 $\Delta = 114^{\circ}48'$
 $D = 56^{\circ}00'$
 $R = 102.31'$
 $L = 205.0'$
 $P.C. = Sta. 3175$
 $P.T. = Sta. 5180$

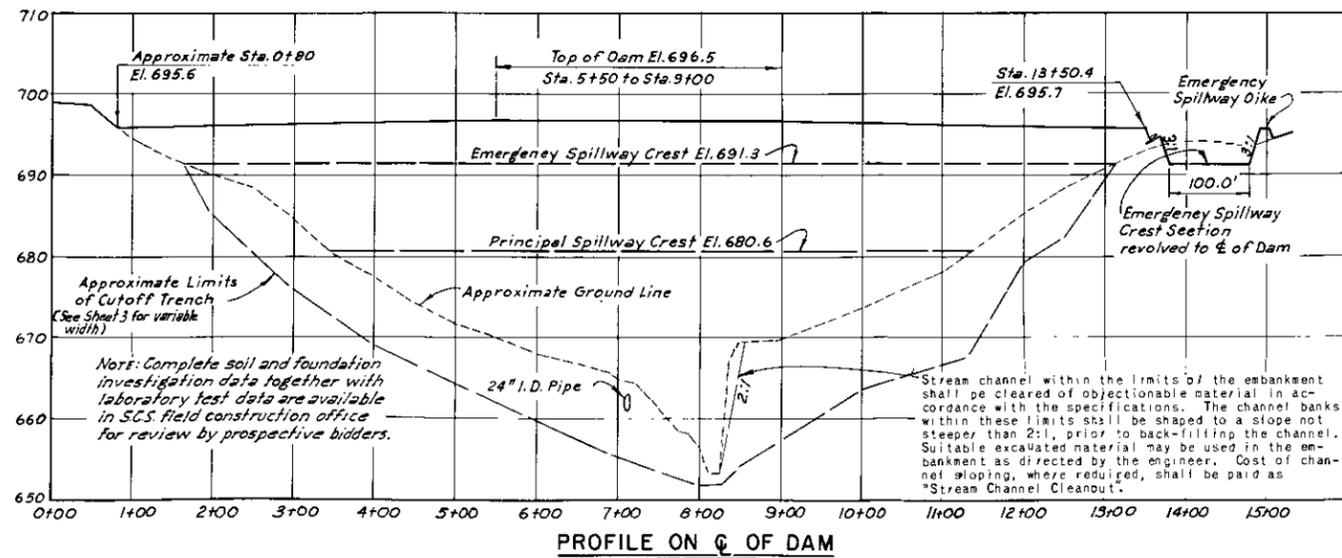


Structure Site No. 10-A, located 7 miles west and 2 miles north of McKinney, Collin County, Texas.

VICINITY MAP



PLAN OF EMBANKMENT AND SPILLWAYS

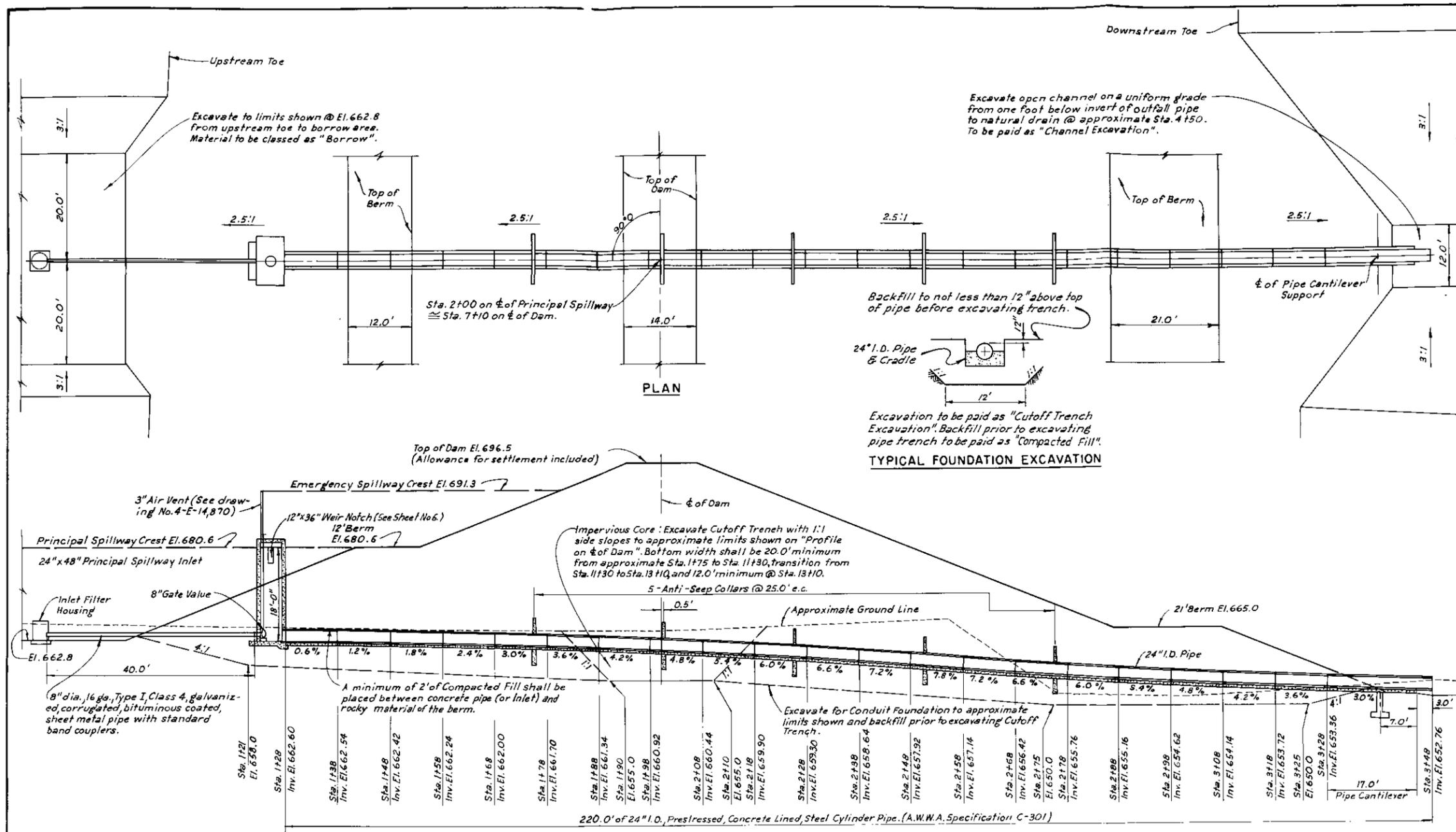


Approximate Limits of Cutoff Trench (See Sheet 3 for variable width)
 Note: Complete soil and foundation investigation data together with laboratory test data are available in S.C.S. field construction office for review by prospective bidders.

Stream channel within the limits of the embankment shall be cleared of objectionable material in accordance with the specifications. The channel banks within these limits shall be shaped to a slope not steeper than 2:1, prior to back-filling the channel. Suitable excavated material may be used in the embankment as directed by the engineer. Cost of channel sloping, where reduced, shall be paid as "Stream Channel Cleanout".

Figure 2

EMBANKMENT PLAN AND PROFILE FLOODWATER RETARDING STRUCTURE SITE No. 10-A EAST FORK ABOVE LAVON WATERSHED OF THE TRINITY RIVER WATERSHED - TEXAS			
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE			
Designed: S.M.B.	Date: 3-63	Approved by: [Signature]	HEAD ENGINEERING & SURVEYING DIVISION FORT WORTH TEXAS
Drawn: D.L.F. & S.M.B.	Date: 3-63	STATE CONSERVATION ENGINEER U.S.C.S.	
Checked: M.G.C.	Date: 4-63	TEMPLE TEXAS	
Checked: S.M.B. & G.W.T.	Date: 4-63	Sheet: No. 2 of 8	Drawing No. 4-E-17,783



**SECTION
PRINCIPAL SPILLWAY**

Figure 3

PRINCIPAL SPILLWAY—PLAN AND SECTION
 FLOODWATER RETARDING STRUCTURE SITE No. 1D-A
 EAST FORK ABOVE LAVON WATERSHED
 OF THE
 TRINITY RIVER WATERSHED - TEXAS

**U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE**

Designed	S.M.B.	Date	3-63	Approved by	[Signature]
Drawn	S.M.B.	Date	3-63	Checked	[Signature]
Traced	M.G.C.	Date	4-63	Sheet	4 of 8
Checked	S.M.B. & W.T.	Date	4-63	Drawing No.	4-E-17,783

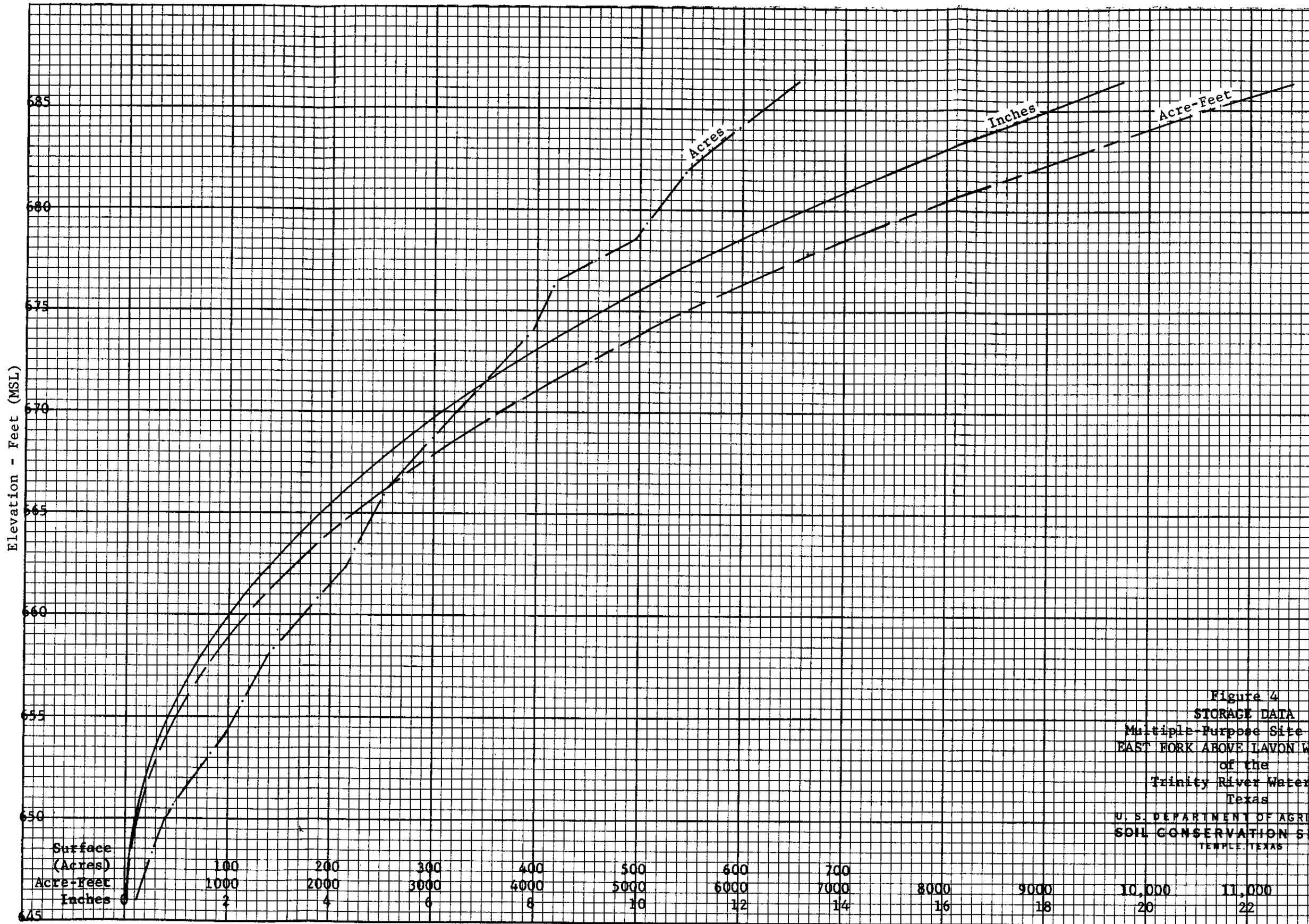


Figure 4
STORAGE DATA
 Multiple-Purpose Site
 EAST FORK ABOVE LAVON W
 of the
 Trinity River Water
 Texas
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 TEMPLE, TEXAS

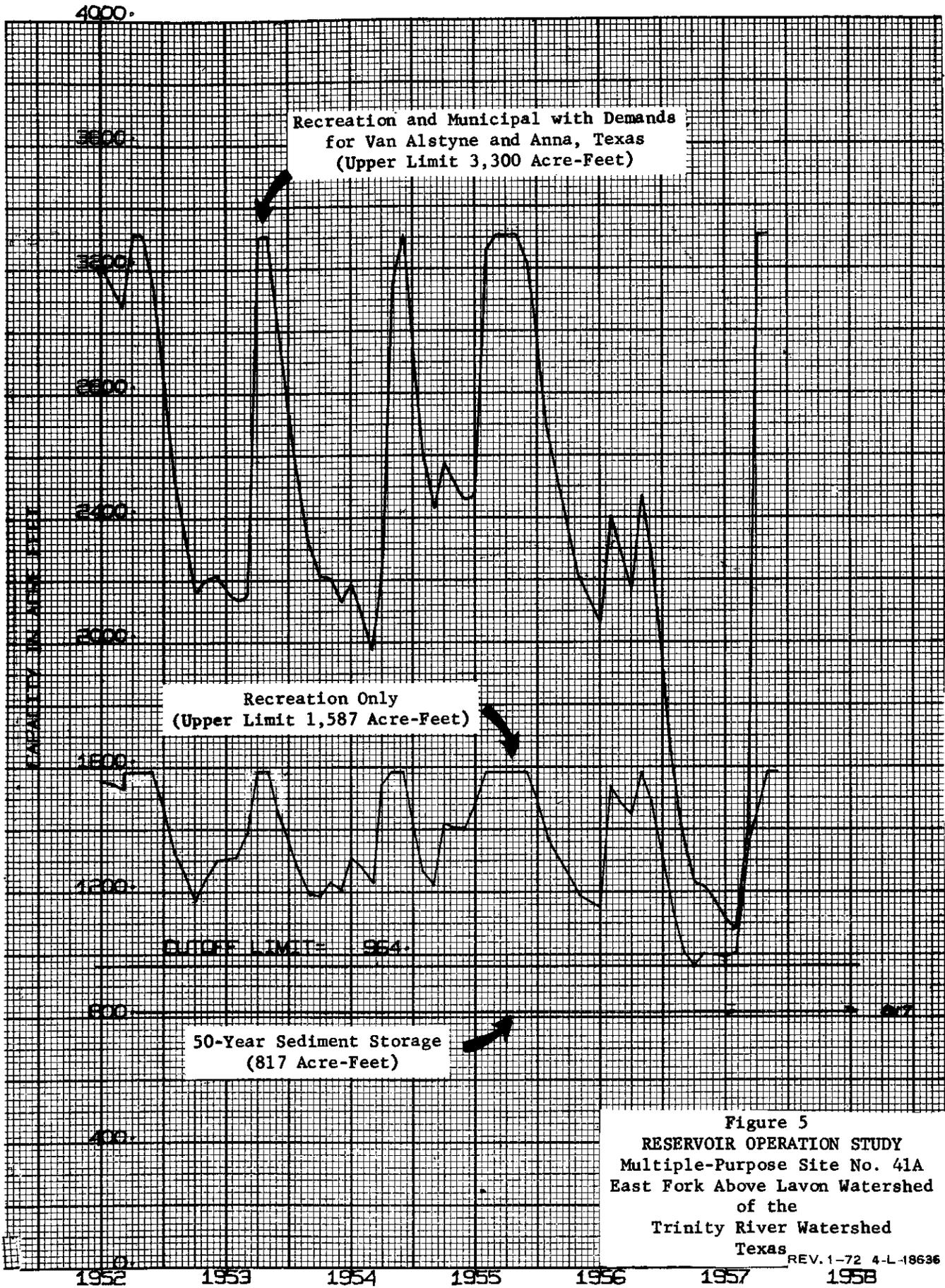
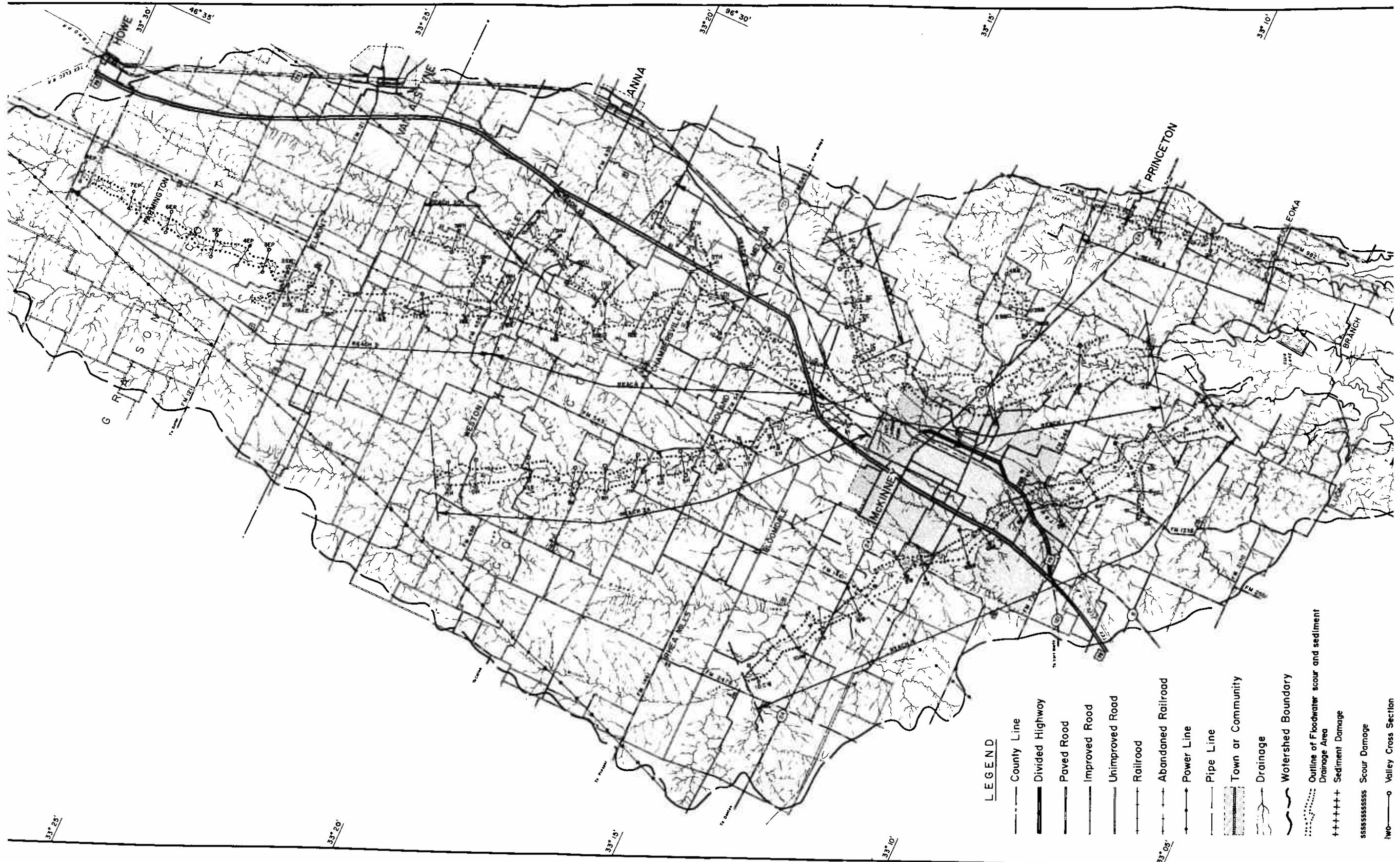


Figure 5
 RESERVOIR OPERATION STUDY
 Multiple-Purpose Site No. 41A
 East Fork Above Lavon Watershed
 of the
 Trinity River Watershed
 Texas

REV. 1-72 4-L-18636



LEGEND

- County Line
- == Divided Highway
- Paved Road
- Improved Road
- Unimproved Road
- +— Railroad
- +— Abandoned Railroad
- Power Line
- Pipe Line
- Town or Community
- Drainage
- Watershed Boundary
- Outline of Floodwater scour and sediment Drainage Area
- +++++ Sediment Damage
- ssssssssss Scour Damage
- hwo Valley Cross Section

33° 25'

33° 20'

33° 15'

33° 10'

33° 05'

33° 30'

46° 35'

33° 25'

33° 20'

96° 30'

33° 15'

33° 10'

G R I F F I N
S O N

H I N N I N G T O N

N E S T O N

A N N A

M A N N I N G S V I L L E

M C K I N N E Y

P R I N C E T O N

F O K A

B R A N C H

To Austin

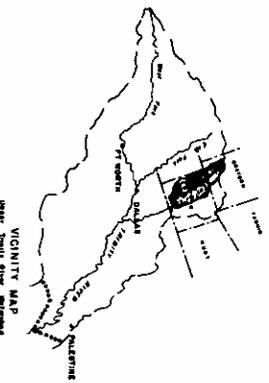
To Dallas

To Fort Worth

FM 1236

FM 200

- LEGEND**
- County Line
 - == Divided Highway
 - == Paved Road
 - == Improved Road
 - == Unimproved Road
 - Railroad
 - Abandoned Railroad
 - Power Line
 - Pipe Line
 - Town or Community
 - Drainage
 - Watershed Boundary
 - Outline of Floodwater scour and sediment
 - Drainage Area
 - +++++ Sediment Damage
 - +++++ Scour Damage
 - Valley Cross Section
 - Evolution Reach



0 1 2 Miles
Approx. Area 200,000 Acres



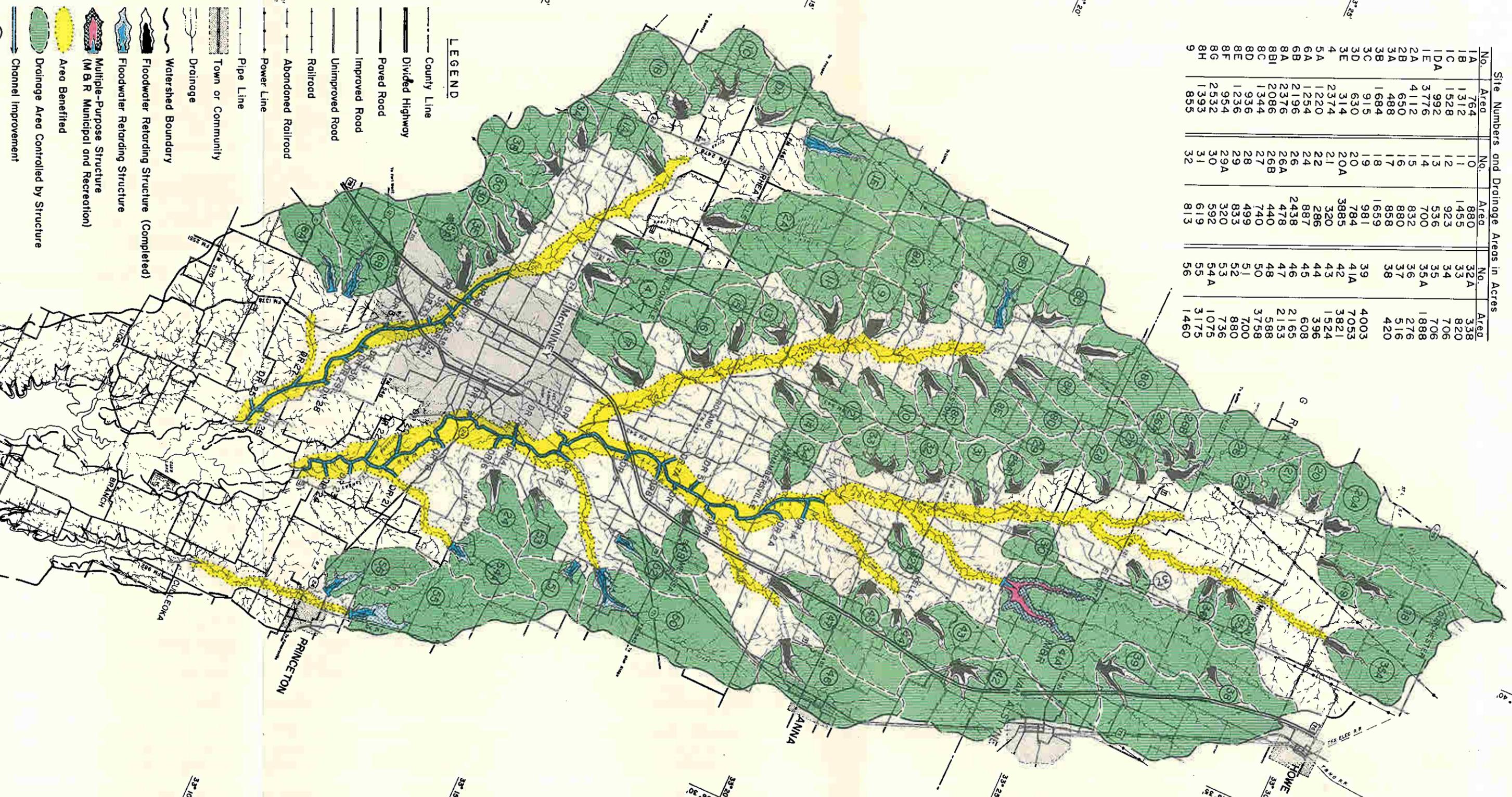
FIGURE 7
PROBLEM LOCATION MAP
EAST FORK ABOVE LAVON WATERSHED
OF THE
TRINITY RIVER WATERSHED
TEXAS
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 TEMPLE, TEXAS

33°30'

96°40'

Site Numbers and Drainage Areas in Acres

No.	Area	No.	Area	No.	Area
1A	764	10	880	32A	338
1B	1312	11	1455	33	820
1C	1528	12	923	34	706
1DA	992	13	536	35	706
1E	3776	14	700	35A	1888
2A	4112	15	832	36	276
2B	650	16	880	37	516
3A	488	17	858	38	420
3B	1684	18	1659	39	4003
3C	915	19	981	41A	7053
3D	630	20	784	42	3821
3E	314	20A	3885	43	1524
4	2374	21	320	44	396
5A	1220	22	286	45	608
6A	1254	24	887	46	2165
6B	2196	26	2438	47	2153
6A	2376	26A	478	48	588
8A	2086	26B	440	50	3758
8B	1344	27	740	51	700
8C	1344	28	499	52	880
8D	936	29	833	53	736
8E	1236	28	830	54A	1075
8F	954	29A	320	55	3175
8G	2532	30	592	55	1075
8H	1393	31	619	55	3175
9	855	32	813	56	1460



LEGEND

- County Line
- == Divided Highway
- == Paved Road
- == Improved Road
- == Unimproved Road
- Railroad
- Abandoned Railroad
- Power Line
- Pipe Line
- Town or Community
- Drainage
- Watershed Boundary
- Floodwater Retarding Structure (Completed)
- Floodwater Retarding Structure
- Multiple-Purpose Structure (M & R Municipal and Recreation)
- Area Benefited
- Drainage Area Controlled by Structure
- Channel Improvement
- Site Number