

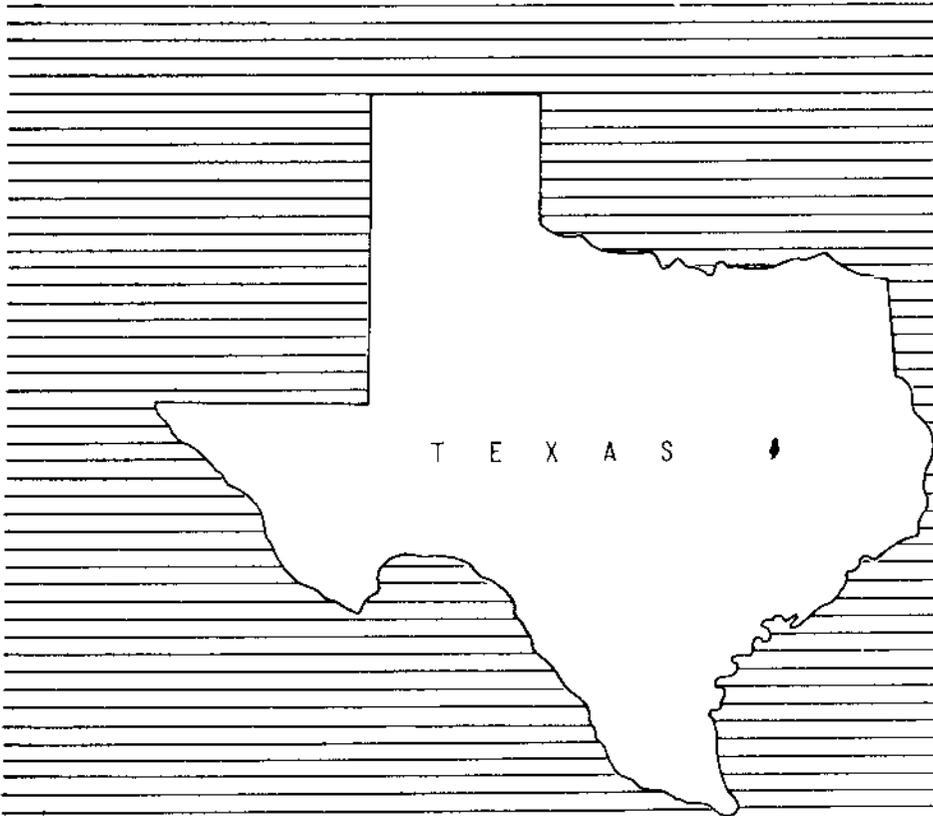
SUPPLEMENTAL

WORK PLAN

- For Watershed Protection, Flood Prevention,
and Recreational Development

TOWN BRANCH WATERSHED

MADISON COUNTY, TEXAS



September 1963

SUPPLEMENTAL WATERSHED WORK PLAN AGREEMENT

between the

Bedias Creek Soil Conservation District
(Local Organization)

City of Madisonville
(Local Organization)

Commissioners Court of Madison County
(Local Organization)

(Hereinafter referred to as the Sponsoring Local Organizations)

in the State of Texas

and the

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

Whereas, the Watershed Work Plan Agreement for the Town Branch Watershed, State of Texas, executed by the sponsoring local organizations named therein and the Service, became effective on the 19th day of April, 1962; and

Whereas, it has been found necessary to modify the watershed work plan to delete fish and wildlife development as a project purpose; and

Whereas, the Sponsoring Local Organizations have recognized an urgent need for a water-based recreation development and associated minimum basic facilities for public use which may be obtained through development of a multiple-purpose reservoir for this purpose; and

Whereas, a Supplemental Watershed Work Plan which modifies the watershed work plan dated October, 1961, for said watershed has been developed through cooperative efforts of the Sponsoring Local Organizations and the Service, which plan is annexed to and made a part of this agreement;

Now, therefore, the Sponsoring Local Organizations and the Service he agree upon the following modifications of the terms, conditions and stipul of said Watershed Work Plan Agreement:

1. Paragraph numbered 1 is modified to read as follows:

The Sponsoring Local Organizations will acquire all land, easemen rights-of-way needed for installation of structural works of improvement (cost \$80,750).

Cost sharing for land acquisition will be as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimate Valu</u> (dolla
Multiple-Purpose Reservoir and Basic Recreational Facilities			
Payments to Landowners for 243 acres	50	50	72,9
Legal Fees, survey costs, other	100	0	5.
Floodwater Retarding Structure	100	0	7,30

2. Paragraph numbered 2 is changed to read as follows:

The Sponsoring Local Organization will acquire water rights pursua State law as may be needed in the installation and operation of the works improvement. (Estimated cost \$600).

3. Paragraph numbered 3 is changed to read as follows:

The percentages of construction costs for structural measurea to l by the Sponsoring Local Organizations and by the Service are:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u> (percent)	<u>Service</u> (percent)	<u>Estimate Construction</u> (dollars)
Multiple-Purpose Structure	18.2	81.8	82,720
Basic Recrsational Facilities	50	50	74,906
Floodwater Retarding Structure	0	100	33,000

The Sponsoring Local Organizations will pay all of the costs allocated to purposes other than flood prevention and recreation. (None anticipated).

4. Paragraph numbered 4 is modified to read:

The Service will bear the cost of all installation services applicable to the multiple-purpose reservoir and the floodwater retarding structure. (Estimated cost \$31,592).

The Service will provide such services as are available from its regularly employed staff for installation of the basic recreational facilities. The Serv will not bear more than 50 percent of the installation servicea cost for basic recreation facilities. This includes private consulting engineering and architectural servicas payments as well as services provided by Service personn (Estimated cost \$14,980).

The Sponsoring Local Organizations will bear the cost of all installation services applicable to works of improvement for purposes other than flood prever and recreation. (None anticipated).

5. Tables 1, 2, 3, 6, 7, 8 and 9 referred to in the watershed work plan a modified to conform with Tables 1, 2, 2A, 3, 4, 5, 6, A (Revised) attached.

6. The coats shown in this agreement represent preliminary estimates. In determining the final costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

7. This agreement does not constitute a financial document to serve as basis for the obligation of Federal funds, and financial or other assistance be furnished by the Service in carrying out the Watershed Work Plan, as revised is contingent on the appropriation of funds for this purpose.

Where there is a Federal contribution to the construction cost of works improvement, a separate agreement in connection with each construction contract between the Service and the Sponsoring Local Organizations will be entered into prior to the issuance of the invitation to bid. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

8. The Sponsoring Local Organizations agree that all land on which Federal assistance is provided will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency which will continue to maintain and operate the recreational development in accordance with the operation and maintenance agreement.

All terms, conditions and stipulations of the Watershed Work Plan Agreement and annexed Supplemental Watershed Work Plan remain unchanged except as modified by this supplemental work plan agreement and annexed supplemental work plan which is hereby made a part of this agreement.

Bedias Creek Soil Conservation District
Local Organization

By T. C. Smith

T. C. Smith

Title Chairman of Board

Date 1-10-64

The signing of this agreement was authorized by a resolution of the governing body of the Bedias Creek Soil Conservation District
Local Organization

adopted at a meeting held on January 10, 1964

R. E. Samuel Jr.
(Secretary, Local Organization)
R. E. Samuel Jr.

Date 1-10-64

City of Madisonville
Local Organization

By C. N. Heath

Title Mayor

Date 1/13/64

The signing of this agreement was authorized by a resolution of the governing body of the City of Madisonville
Local Organization

adopted at a meeting held on 1/13/64

Ross Madole
(Secretary, Local Organization)
Ross Madole

Date 1/13/64

Commissioners Court of Madison County
Local Organization

By J. C. Wells
J. C. Wells
Title County Judge
Date 1-13-64

The signing of this agreement was authorized by a resolution of the governing body of the Commissioners Court of Madison County
Local Organization
adopted at a meeting held on 1-13-64

Marie Evans Co. Clerk
(Secretary, Local Organization)
Marie Evans

Date 1-13-64

Local Organization

By _____

Title _____

Date _____

The signing of this agreement was authorized by a resolution of the governing body of the _____
Local Organization
adopted at a meeting held on _____

(Secretary, Local Organization)

Date _____

Soil Conservation Service
United States Department of Agriculture

By _____
State Conservationist

Date _____

SUPPLEMENTAL
WATERSHED WORK PLAN
FOR
WATERSHED PROTECTION, FLOOD PREVENTION
AND RECREATIONAL DEVELOPMENT

TOWN BRANCH WATERSHED
Madison County, Texas

Prepared Under the Authority of the Watershed
Protection and Flood Prevention Act, (Public Law
566, 83rd Congress, 68 Stat. 666), as amended

Prepared By:

Bedias Creek Soil Conservation District
(Cosponsor)

City of Madisonville
(Cosponsor)

Commissioners Court of Madison County
(Cosponsor)

With Assistance By:

U. S. Department of Agriculture
Soil Conservation Service
September 1963

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SUPPLEMENTAL
WATERSHED WORK PLAN

TOWN BRANCH WATERSHED
Madison County, Texas
September 1963

Purpose

Under the new amendments to Public Law 566, the provisions for fish and wildlife included in the approved work plan are redefined as recreational development. This does not represent a change in the intended use of the facilities. Intensification of use of water-based facilities will be brought about by this supplemental agreement, since plans are made to include all applicable recreational uses except hunting. Public access to all areas which may be used for recreational purposes is to be provided throughout the planned life of the project in order that evaluated benefits may be realized.

Change in Scope

The scope of the project is changed to include recreational development. The locations and designs of structures, the degree of control, and the remaining damages with the project installed remain as shown in the original work plan.

As a result of the amendment to Section 4 of Public Law 566, which permits Federal financial assistance, upon economic justification, in fully developing water-based recreational facilities, the local sponsors have requested that the 400 acre-feet of water previously allocated to fish and wildlife development be reallocated to recreational development. Included in the recreational development are the minimum basic facilities which are essential for public health, safety, access, and use.

Change in Major Features

In accordance with the revised procedures for cost allocation and cost-sharing brought about by amendments to the Act, a number of changes are made in the arrangements as set forth in the work plan agreement.

1. The construction cost of those features of the multiple-purpose reservoir that are used jointly by both purposes including sediment storage are allocated to purpose on the basis of the capacity or proportion of the reservoir to be occupied by each.

The percentage of reservoir joint construction costs allocated to flood prevention and recreation has been

to the maximum flow line of the reservoir. This area of approximately 182 acres includes the dam, spillway, storage pool, and access area for public use above the maximum flow line. In addition, Public Law 566 funds will share to the extent of 50 percent of the payments made for land rights required for minimum basic facilities for public access and use. Lands for this purpose involve 61 acres.

Land values used in the original work plan for the multiple purpose and floodwater retarding structures have been increased from \$200 to \$300 per acre to accurately reflect current land values.

WATERSHED PROBLEMS

Problems Relating to Water Management

The first two paragraphs remain unchanged. The third paragraph is no longer applicable and is deleted.

Sufficient facilities for supplying the demand for water-based recreation within normal driving distance of the Town Branch watershed are not presently available. The nearest reservoirs of any size are Lake Houston on the San Jacinto River and Lake Belton on the Leon River, each of which is approximately 100 miles from the proposed reservoir. It is estimated from the 1960 census that within a 50 mile radius of the proposed reservoir there are 76 cities, towns and a total urban and rural population of 150,000 people.

WORKS OF IMPROVEMENT TO BE INSTALLED

Structural Measures

The last sentence of the first paragraph is changed to read "Additional storage of 400 acre-feet is included in the multiple-purpose reservoir for recreational development".

Recreational storage in the multiple-purpose structure will replace the storage provided by the original plan for fish and wildlife and will not increase the storage capacity or the surface area of the permanent pool.

Of the estimated 243 acres of land used for recreational development, 61 acres are for public access and location of minimum basic facilities.

Minimum basic facilities will consist of the following items:

<u>Item</u>	<u>Unit</u>	<u>Amount</u>
1. Barbecue pits	No.	15

<u>Item</u>	<u>Unit</u>	<u>Amount</u>
2. Picnic tables and benches	No.	30
3. Garbage disposal pits	No.	6
4. Sanitary facilities	No.	3
5. Graveled parking areas	No.	3
6. Beach area	Acre	2
7. Boat dock	No.	1
8. Launching ramp	No.	1
9. Access roads	Mile	1.32
10. Water lines for drinking and sanitary facilities	Mile	1.25
11. Power lines (and poles) for lighting	Mile	1.25
12. Fencing	Mile	2.20

The location of the minimum basic facilities is shown on figure 7.

Land treatment measures to be applied and the unit cost of each measure are the same as shown in the original workplan.

EXPLANATION OF INSTALLATION COSTS

The revised local project costs for works of improvement consisting of construction (\$52,467), land easements (\$44,300) including legal fees, administration of contracts (\$1,000), water rights (\$600), and installation services (\$7,490), are estimated at \$105,857 (table 2).

The installation cost of the multiple-purpose structure, \$159,372, is all \$66,358 to flood prevention and \$93,014 to recreational development. Allocation was based on the capacity in acre-feet dedicated to each purpose.

Of the \$66,358 allocated to flood prevention, local interests will cost share in the amount of \$573. This includes administration of contracts, \$318 and legal fees, \$255. Public Law 566 costs are estimated to be \$65,785 which includes construction, \$52,693 and installation services, \$13,092.

Of the \$93,014 of cost allocated to recreational development, local interests will cost share in the amount of \$43,241. This includes construction, \$15,013, administration of contracts, \$182, land, easements and rights-of-way, \$27,460, legal fees, \$145, and water rights, \$600. Public Law 566 costs are estimated to be \$49,773 and includes construction, \$15,013, installation services, \$7,460, and land, easements and rights-of-way, \$27,300.

The cost of basic facilities for public access and use is estimated to be \$108,336.

Of the \$108,336 cost for basic recreational facilities, sharing is estimated at \$54,093 Public Law 566 funds and \$54,243 other funds. The local share comprised of: construction, \$37,453, installation services, \$7,490, land, easements and rights-of-way, \$9,150, and legal fees, \$150.

Cost sharing was determined based on policy outlined in Watersheds Memorandum SCS-64.

No part of the cost will be borne by the Federal Government for water resource improvements, minimum basic facilities, or land, easements, or rights-of-way which have been constructed or acquired by the local organizations prior to the execution of appropriate project agreements providing for cost sharing on expenditures to be made after the date of such agreements.

PROJECT BENEFITS

The last paragraph of this section is replaced with the following:

The total flood prevention benefits resulting from the structural measures are estimated to average \$8,255 annually. It is estimated that the project will produce local secondary benefits averaging \$2,530 annually. Secondary benefits from a national viewpoint were not considered pertinent to the economic evaluation.

In addition, other substantial benefits will accrue from the project. These include an increased sense of security, better living conditions, and improved wildlife habitat. None of these benefits was evaluated in monetary terms or used for project justification.

Recreational developments at the multiple-purpose reservoir will provide facilities for fishing, swimming, boating, water skiing, and picnicking. Relatively short, mild winter seasons will permit some type of recreation at this location throughout most of the year. Peak recreational use is expected during the period May through August. It is estimated that approximately 13,900 people will benefit from the development annually. Special week-ends during the period of high use and holidays, will be the days of more intensive use of recreational facilities. It is anticipated that more than 200 people will visit the area on peak days. Minimum basic facilities to accommodate these visitors are provided by this plan.

Analysis of available information for existing recreational facilities in this general area of the State and comparison of basic facilities provided with those included in the plan indicated that the values per user day for the multiple-purpose reservoir would be \$1.25. Based on basic facilities provided for recreation and the anticipated use of these facilities, the

estimated average annual benefits from recreation are calculated as follows:

Number of visitor-days annually	13,800
Value per visitor-day (net)	\$1.25
Total average annual recreation benefits	\$17,250

COMPARISON OF BENEFITS AND COSTS

The ratio of average annual benefits from planned structural measures for flood prevention (\$8,255) to the average annual equivalent cost (\$4,791) is 1.3:1 (table 6). The ratio of average annual benefits from recreational development (\$17,250) to the average annual equivalent cost for recreation (\$13,459) is 1.3:1. The estimated total average annual primary project benefits (\$25,505) compared with the estimated total average annual equivalent cost (\$18,250) is 1.4:1.

The ratio of the total average annual project benefits (\$28,035) to the average annual cost of structural measures (\$18,250) is 1.5 to 1 (table

FINANCING PROJECT INSTALLATION

The last 3 sentences of the first paragraph, page 15 extending to page 1 are changed to read "Funds for the local share of the project costs including land, easements, rights-of-way, administration of contracts, and the local share of the construction cost allocated to recreational development, are available in the general funds of the county and city and are supported by tax revenue. It is anticipated that practically all of the local cost of structural measures, \$105,857, will be out-of-pocket. The sponsors plan to borrow money from private sources to finance their share of the installation cost".

PROVISIONS FOR OPERATION AND MAINTENANCE

Structural Measures for Flood Prevention and Recreation

Recreation replaces Fish and Wildlife Development in the above heading. "In addition to the \$310 estimated annual operation and maintenance for structures, an amount of \$5,520 annually is estimated for maintenance, replacement, and other costs in connection with recreational aspects of the project". This cost will be financed from general funds of the county and city and regularly employed personnel will be used as needed.

The sixth paragraph is not applicable and is deleted.

7

COST SHARING

The second paragraph is changed to read:

The installation cost of the floodwater retarding structure, \$51,84 will be shared \$44,040 (construction, \$33,000, and installation services \$11,040) by Public Law 566 funds and \$7,800 (easements, \$7,300, and administration of contracts, \$500) by other than Public Law 566 funds.

The cost of the multiple-purpose structure, \$159,372, is allocated \$66,358 to flood prevention and \$93,014 to recreational development. Cost allocation is based on the storage capacity dedicated to each purpose. Details of cost allocation and cost sharing are shown in table 2A.

The estimated cost of basic recreational facilities, \$108,336, will be shared \$54,093 by Public Law 566 funds and \$54,243 by other than Public Law 566 funds.

The total cost of works of improvement, \$319,548, will be shared 66.9 percent, \$213,691, by Public Law 566 funds and 33.1 percent, \$105,857, by other than Public Law 566 funds.

The total project cost, including land treatment, \$334,488, will be shared 63.9 percent, \$213,691, by Public Law 566 funds and 36.1 percent, \$120,797 by other than Public Law 566 funds. In addition, the total annual cost of operation and maintenance will be borne by local interests.

TABLE I - ESTIMATED PROJECT INSTALLATION COST

Town Branch Watershed, Texas
Price Base: 1963

Installation Cost Item	Unit	Number to be Applied <u>1/</u>	Estimated Cost		
			Dollars <u>2/</u>	Public Law 566 Funds	Other Funds
<u>LAND TREATMENT FOR</u>					
Watershed Protection					
Soil Conservation Service					
Pasture Planting	Acre	93	-	2,790	2,
Grassland Renovation	Acre	211	-	6,330	6,
Proper Pasture Use	Acre	400	-	1,180	1,
Farm Ponds	No.	4	-	1,600	1,
Grassed Waterways	Acre	2	-	300	
Brush Control	Acre	47	-	1,880	1,
Technical Assistance			-	860	
SCS Subtotal				14,940	14,
<u>TOTAL LAND TREATMENT</u>			-	14,940	14,
<u>STRUCTURAL MEASURES</u>					
Soil Conservation Service					
Multiple-Purpose Structure	No.	1	67,706	15,014	82,
Basic Recreational Facilities	No.	1	37,453	37,453	74,
Floodwater Retarding Structure	No.	1	33,000	-	33,
SCS Subtotal			138,159	52,467	190,
Subtotal - Construction			138,159	52,467	190,
<u>Installation Services</u>					
Soil Conservation Service					
Engineering Service			25,979	4,824	30,
Other			13,103	2,666	15,
SCS Subtotal			39,082	7,490	46,
Subtotal - Installation Services			39,082	7,490	46,
<u>Other Costs</u>					
Land, Easements, and Rights-of-Way			36,450	44,300	80,
Administration of Contracts			-	1,000	1,
Water Rights			-	600	
Subtotal - Other			36,450	45,900	82,
<u>TOTAL STRUCTURAL MEASURES</u>			213,691	105,857	319,
<u>TOTAL PROJECT</u>			213,691	120,797	334,
<u>SUMMARY</u>					
Subtotal SCS			213,691	120,797	334,
<u>TOTAL PROJECT</u>			213,691	120,797	334,

1/ No Federal lands involved

2/ Price base: 1963

3/ Price base: 1961 for land treatment.

Supplement (Replaces Table I in
original work plan
September 1963)

TABLE 2 - ESTIMATED STRUCTURE COST DISTRIBUTION

Dunn Branch Watershed, Texas

(Dollars) 1/

Structure Number or Name	Installation Cost - Public Law 566 Funds				Installation Cost - Other Funds				Estimated Total Cost				
	Construction	Installation Engineer-Ing	Installation Services: Engineer-Ing	Installation Services: Total	Construction	Installation Engineer-Ing	Installation Services: Engineer-Ing	Installation Services: Total					
Multiple-Purpose Structure 1	67,706	13,235	7,317	27,300	115,558	15,014	-	500	27,700	600	43,814	159,372	
Basic Recreational Facilities	37,451	4,824	2,666	9,150	54,093	37,453	4,824	7,666	-	9,300	-	54,243	108,336
Floodwater Retarding Structure 2	33,000	7,920	3,120	-	44,040	-	-	500	7,300	-	7,800	51,840	
TOTAL	138,159	25,979	13,103	36,450	213,691	52,467	4,824	2,666	1,000	44,300	600	105,857	319,548

1/ Price Base: 1963.

Supplement
September 1963
(Replaces Table 2 in
original work plan)

TABLE 2A - COST ALLOCATION AND COST SHARING SUMMARY

Town Branch Watershed, Texas

(Dollars) 1/

Item	Purpose		Total
	Flood Prevention	Recreation	
<u>COST ALLOCATION</u>			
Multiple-Purpose Structure No. 1	66,358	93,014	159,372
Basic Recreational Facilities	-	108,336	108,336
Single-Purpose Structure No. 2	51,840	-	51,840
Total	118,198	201,350	319,548
<u>COST SHARING</u>			
Public Law 566	109,825	103,866	213,691
Other	8,373	97,484	105,857
Total	118,198	201,350	319,548

1/ Derived from installation cost based on 1963 price levels.

Supplement
September 1963
(Replaces Table 9 in
original work plan)

TABLE 3 - STRUCTURE DATA - FLOODWATER RETARDING STRUCTURE
AND MULTIPLE-PURPOSE STRUCTURE

Turn Branch Watershed, Texas

Item	Unit	Structure Number		Total
		1	2	
Drainage Area	Sq. Mi.	1.07	0.25	1.32
Storage Capacity				
Sediment Pool	Ac. Ft.	7	11	18
Sediment in Recreation Pool	Ac. Ft.	18	xx	18
Sediment in Detention Pool	Ac. Ft.	3	1	4
Recreation	Ac. Ft.	400	xx	400
Floodwater	Ac. Ft.	673	157	830
Total	Ac. Ft.	1,101	169	1,270
Surface Area				
Sediment Pool <u>1/</u>	Acres	4	4	8
Recreation	Acres	75	xx	75
Floodwater Pool	Acres	130	23	153
Volume of Fill	Cu. Yd.	143,000	57,000	200,000
Elevation Top of Dam	Foot	296.3	294.5	xxx
Maximum Height of Dam <u>2/</u>	Foot	35	31	xxx
Emergency Spillway				
Crest Elevation	Foot	291.5	290.0	xxx
Bottom Width	Foot	80	70	xxx
Type	Veg.	Veg.	Veg.	xxx
Percent Chance of Rise <u>3/</u>		1	1	xxx
Average Curve No. - Condition II		82	82	xxx
Emergency Spillway Hydrograph				
Storm Rainfall (6-hour) <u>4/</u>	Inch	14.50	14.96	xxx
Storm Runoff	Inch	12.01	12.47	xxx
Velocity of Flow (V_c) <u>5/</u>	Ft./Sec.	1.33	1.35	xxx
Discharge Rate <u>6/</u>	C.F.S.	85	140	xxx
Maximum Water Surface Elevation <u>6/</u>	Foot	294.4	291.2	xxx
Freeboard Hydrograph				
Storm Rainfall (6-hour) <u>7/</u>	Inch	36.30	37.40	xxx
Storm Runoff	Inch	33.63	34.73	xxx
Velocity of Flow (V_r) <u>8/</u>	Ft./Sec.	9.4	9.0	xxx
Discharge Rate <u>6/</u>	C.F.S.	2,065	1,635	xxx
Maximum Water Surface Elevation <u>6/</u>	Foot	296.3	294.5	xxx
Principal Spillway Capacity (Maximum)	C.F.S.	15	5	xxx
Capacity Equivalents				
Sediment Volume	Inch	8.13	0.80	xxx
Sediment Recreation Pool	Inch	0.32	xx	xxx
Sediment in Detention Pool	Inch	0.05	0.10	xxx
Detention Volume	Inch	11.80	11.75	xxx
Recreation Volume	Inch	7.00	xx	xxx
Spillway Storage <u>9/</u>	Inch	13.10	9.75	xxx
Class of Structure		C	C	xxx

1/ Surface area to the top of the riser.

2/ Difference in elevation between the top of the settled dam and the bottom of the stream channel.

3/ Is the average number of times the emergency spillway will be expected to function in 100 years based on a regional analysis of gaged runoff.

4/ For Class C structures, 1.0 x P of the 6-hour rainfall shown by Figure 3.21-1, NEH-4, Supplement

5/ Where velocity is shown it was obtained from the formula $V = \frac{Q}{A}$ and was determined from the route hp and Q. Critical velocity was not attained by any of the routings of the emergency spillway hydrograph due to little or no flow.

6/ Values obtained from routing.

7/ For Class C structures 2.50 x P for 6-hour rainfall shown on Figure 3.21-1, NEH, Section 4, Supplement A.

8/ Obtained from curves drawn from Figure 4-R-11472 revised 3-59 and ES 98 dated 4-27-55, based on flows obtained from graphical routing of the freeboard hydrograph.

9/ Watershed inches stored between the emergency spillway crest and the top of the settled dam.

Supplement
September 1963
(Replaces Table 1 in
original work plan)

TABLE 4 - ANNUAL COST

Town Branch Watershed, Texas

(Dollars)

Measures	: Amortization : of : Installation : Costs <u>1/</u>	: Operation : and : Maintenance : Cost <u>2/</u>	: Total
Multiple-Purpose Structure No. 1, Basic Recreational Facilities and Floodwater Retarding Structure No. 2	12,420	5,830	18,250
TOTAL	12,420	5,830	18,250

1/ 1963 Prices amortized for 50 years at 3 percent.

2/ Long-term prices as projected by ARS, September 1957. Includes \$5,520 for replacement, operation and maintenance of basic recreational facilities.

Supplement
September 1963
(Replaces Table 6 in
original work plan)

TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Town Branch Watershed, Texas

(Dollars) 1/

Item	Estimated Average Annual Damage		Average Annual Reduction Benefit
	Without Project	With Project	
Floodwater			
Crop and Pasture	41	18	23
Other Agricultural	42	0	42
Nonagricultural			
Urban Residential and Business	7,800	202	7,598
Street and Utility	289	2	287
Highway and Bridge	48	1	47
Subtotal	8,220	223	7,997
Sediment			
Overbank Deposition	101	20	81
Indirect	1,082	32	1,050
Total	9,403	275	9,128

1/ Long-term prices as projected by ARS, September 1957.

Supplement
September 1961
(Replaces Table 5
original work p. 10)

TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Town Branch Watershed, Texas
(Dollars)

Measures	AVERAGE ANNUAL BENEFITS 1/			Average Annual Cost 2/	Benefit Cost Ratio
	Flood Prevention	Damage Reduction	Secondary Recreation		
Multiple-Purpose Structure No. 1, Basic Recreational Facilities					
and					
Floodwater Retarding Structure No. 2	8,255	2,530	17,250	28,035	1.5:1
GRAND TOTAL	3/ 8,255	2,530	17,250	28,035	1.5:1

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

2/ From Table 4.

3/ In addition, it is estimated that land treatment measures will provide flood drainage reduction benefits of \$873 annually.

Table A - Estimated Construction Cost of Recreational Facilities

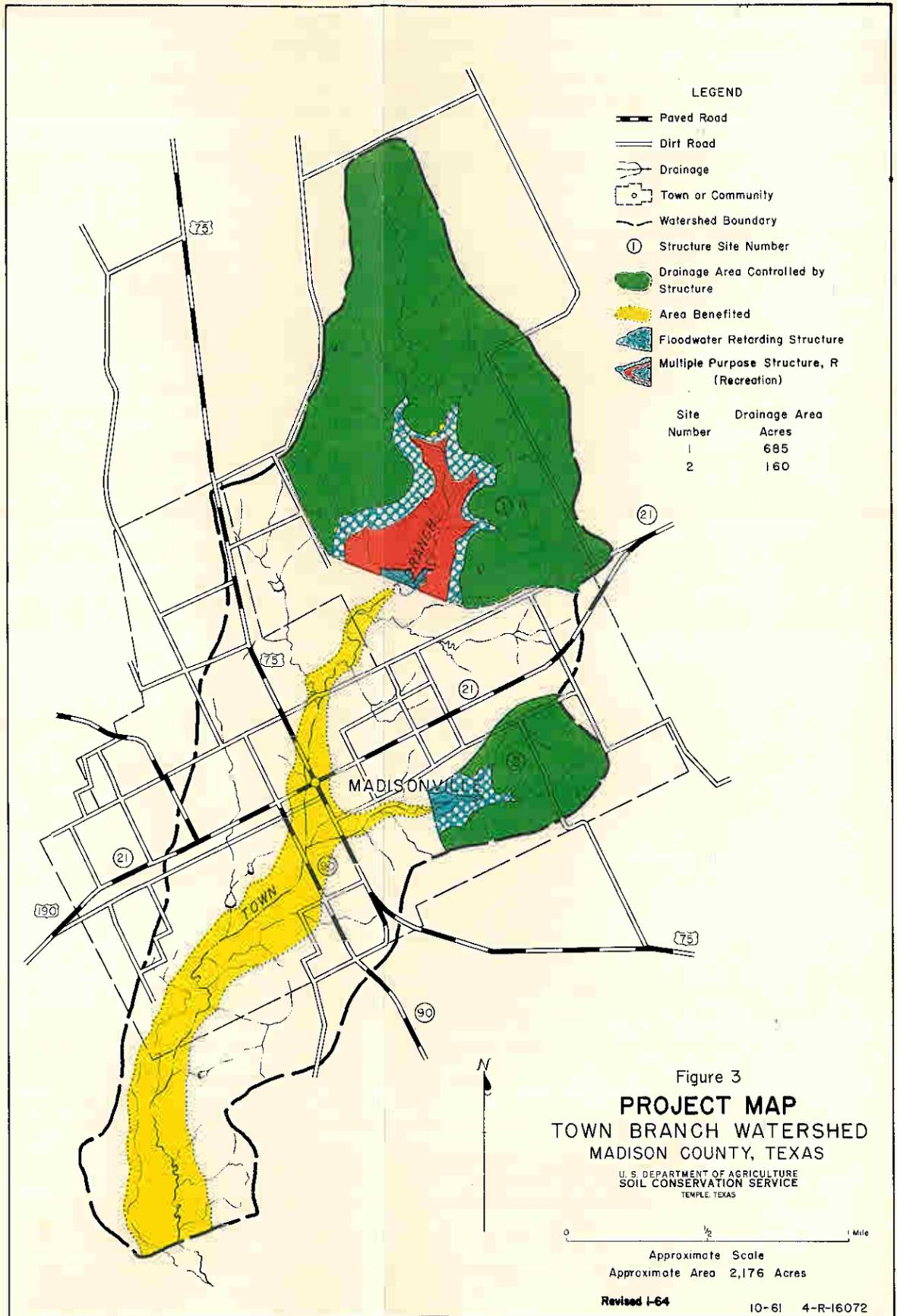
Town Branch Watershed, Texas

Site No. 1

Item	: Unit	: Number	: Unit Cost (dollars)	: Amount (dollars)
1. Barbecue pits	Number	15	75	1,24
2. Picnic tables and benches (concrete)	Number	30	250	8,25
3. Garbage disposal pits	Number	6	125	82
4. Sanitary facilities (including 1-1/4 miles of sewer line)	Number	3	4,800 <u>2/</u>	15,84
5. Graveled parking areas	Number (2 acres)	3	1,800	5,94
6. Beach area	Acres	2	-	3,63
7. Boat docks and launching ramp (including channel deepening to ramp and dock)	Number	2	6,250	13,70
8. Access roads (including bridges and culverts) 0.85 mile paved at \$13,000 per mile and 0.47 mile graveled road at \$4,500 per mile	Miles			14,46
9. Water for drinking and sanitary facilities (including 1-1/4 miles of 2-inch pipe) <u>2/</u>	Miles			6,87
10. Power lines and poles for lighting <u>2/</u>	Miles	1-1/4		2,20
11. Fencing	Miles	2.2	800	1,93
Facilities Total				74,90
Installation Services				14,98
Total				89,88

1/ Cost includes 10 percent for contingencies.

2/ Water, sewer and electrical facilities are available in the immediate area.
 Supplement
 September 1963



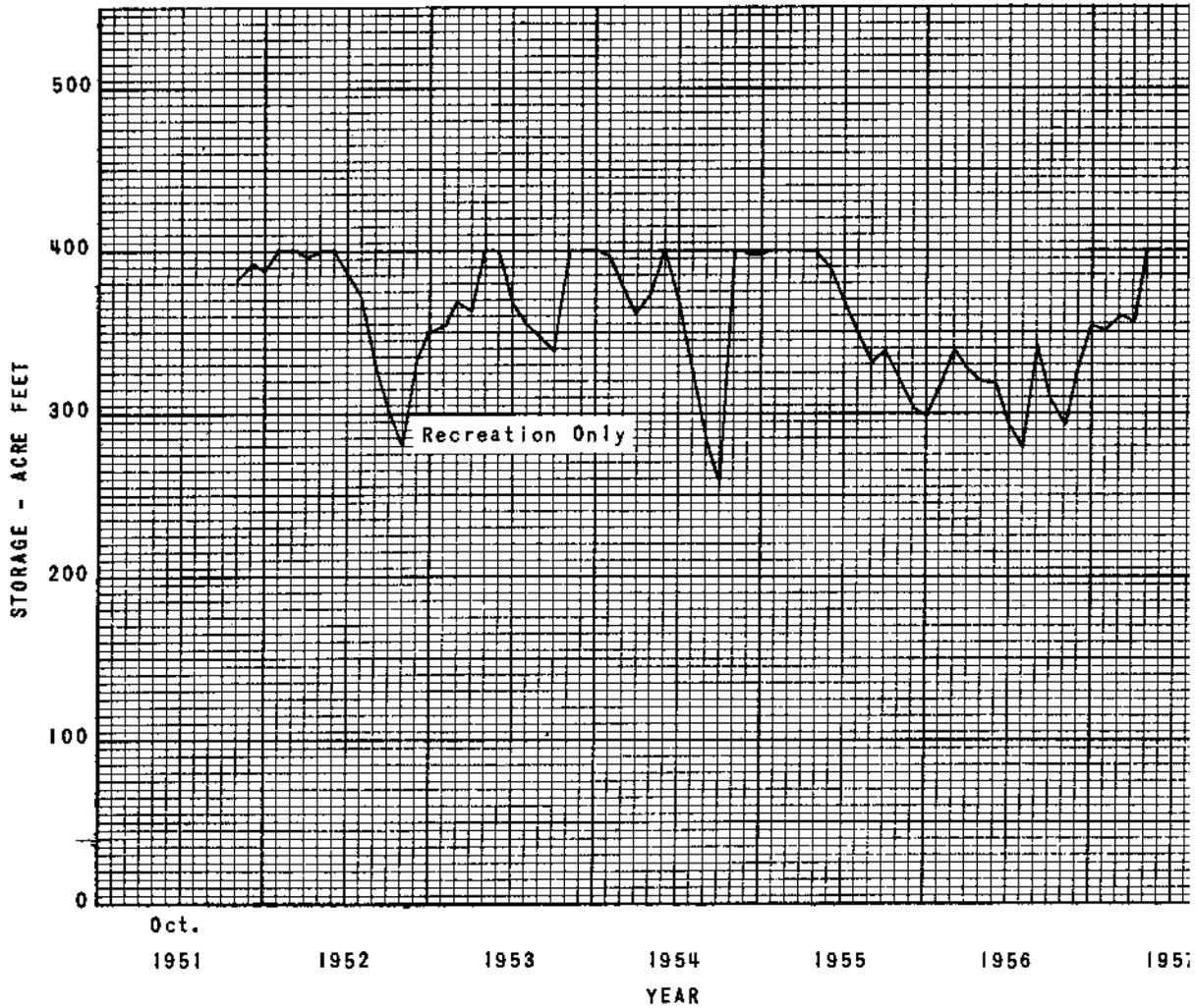
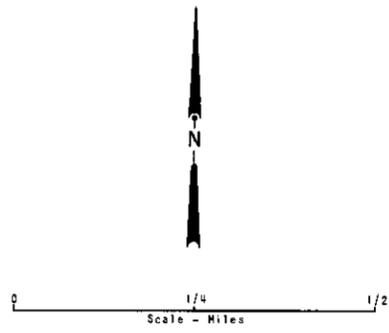
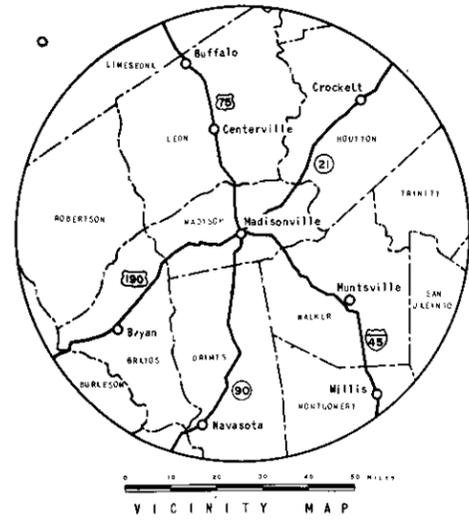


Figure 6
RESERVOIR OPERATION STUDY
 Multiple Purpose Site No. 1
 TOWN BRANCH WATERSHED
 TEXAS



- LEGEND**
- Town Limits
 - Existing Roads and Highways
 - Recreation Area
 - Recreation Facility Area
(Areas 1 and 5 - Boat Dock and Launching Ramp; 2, 3, and 6 - Picnic, Sanitary, and Parking; 4 - Beach Development)
 - 284.8 Recreation Pool MSL Elevation
 - 291.5 Emergency Spillway MSL Elevation
 - 293.5 Emergency Spillway Plus 2.0 Ft. Depth of Flow MSL Elevation
 - NS Access Road to be Hard Surfaced
 - G Access Road to be Gravelled



Figure 7
RECREATIONAL DEVELOPMENT
 TOWN BRANCH WATERSHED
 SITE NO. 1
 MADISON COUNTY, TEXAS
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 Temple, Texas