

**SUPPLEMENTAL**

**WATERSHED WORK PLAN NO IV.**

**FOR**

**WATERSHED PROTECTION, FLOOD PREVENTION, RECREATION**

**AND**

**AGRICULTURAL AND NON-AGRICULTURAL WATER MANAGEMENT**

**CHOCTAW CREEK WATERSHED**

**GRAYSON COUNTY, TEXAS**

**NOVEMBER 1993**

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**SUPPLEMENT WATERSHED PLAN NO. IV  
FOR  
WATERSHED PROTECTION, FLOOD PREVENTION, AND RECREATION**

**CHOCTAW CREEK WATERSHED  
Grayson 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:

Choctaw Watershed Improvement District  
Upper Elm-Red Soil and Water Conservation District  
Grayson County Commissioners Court  
City of Sherman  
City of Denison  
City of Bells

With Assistance by:

U.S. Department of Agriculture  
Soil Conservation Service

November 1993

**SUPPLEMENTAL WATERSHED WORK PLAN AGREEMENT NO. IV**

Between the

Choctaw Watershed Improvement District  
Local Organization

Upper Elm-Red Soil and Water Conservation District  
Local Organization

Grayson County Commissioners Court  
Local Organization

City of Sherman  
Local Organization

City of Denison  
Local Organization

City of Bells  
Local Organization

State of Texas  
(hereinafter referred to as the Sponsoring Organizations)

and the

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

**Supplement No. IV - Choctaw Creek Watershed - Grayson County, Texas**

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Whereas, the Watershed Plan for the Choctaw Creek Watershed, State of Texas, executed by the Sponsoring Local Organizations named therein and the Service, became effective on the 12th day of October, 1966; and

Whereas, the Supplemental Watershed Work Plan Agreement No. I for the Choctaw Creek Watershed, State of Texas, executed by the Sponsoring Local Organizations and the Service, became effective on the 17th day of August, 1971; and

Whereas, the Supplemental Watershed Work Plan Agreement No. II for the Choctaw Creek Watershed, State of Texas, executed by the Sponsoring Local Organizations and the Service, became effective on the 24th day of November, 1971; and

Whereas, the Supplemental Watershed Work Plan Agreement No. III for the Choctaw Creek Watershed, State of Texas, executed by the Sponsoring Local Organizations and the Service, became effective on the 14th day of November, 1972; and

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

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Soil Conservation Service (SCS); and

Whereas, a Supplemental Watershed Plan which modifies the watershed plan dated the 12th day of October, 1966 for said watershed has been developed through the cooperative efforts of the Sponsors and the SCS;

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

1. Change the plan by deleting multiple-purpose structures No. 1, 4, 30, and 35 and floodwater retarding structures No. 2 and No. 6.; and
2. Add floodwater retarding structures Nos. 1A, 1B, 1C, 2A, 4 Rev., 30 Rev., and 35 Rev.; and

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3. The City of Bells ceases to be a co-sponsor effective as the date this supplemental Watershed Work Plan is executed; and
4. Delete all of the stream channel improvement; and
5. Delete all of the drainage mains and laterals; and
6. Paragraph numbered 1 is modified to read as follows:

Except as hereinafter provided, the Sponsoring Local Organizations will acquire without cost to the federal government such land rights as will be needed in connection with the works of improvement. (Estimated cost \$1,405,180).

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

<u>Works of Improvement</u>	<u>Sponsoring Local Organizations</u> (percent)	<u>Service</u> (percent)	<u>Estimated Land Rights Cost</u> (dollars)
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Multiple-Purpose  
Structure No. 10A  
(Sherman)

Payments to land-owners for about 85 acres (34.4 hectares), cost of modification of improvements, and land rights appraisal costs	100.00	-	26,300
Legal fees, survey costs, flowage easements, and other costs	100.00	-	500

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<u>Works of Improvement</u>	<u>Sponsoring Local Organizations (percent)</u>	<u>Service (percent)</u>	<u>Estimated Land Rights Cost (dollars)</u>
<u>Multiple-Purpose Structure No. 38 and Basic Recreational Facilities (Denison)</u>			
Payments to land- owners for about 40 acres (16.2 hectares), cost of modification of improvements, and land rights appraisal costs	50.00	50.00	75,600
Legal fees, survey costs, flowage easements, and other costs	100.00	-	2,300
<u>All other Structural Measures</u>			
	100.00	-	1,300,480

7. Paragraph numbered 2 is modified to read as follows:

The Sponsoring Local Organizations will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement. (Estimated cost \$1,300.)

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8. Paragraph numbered 3 is modified to read as follows:

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

<u>Works of Improvement</u>	<u>Sponsoring Local Organizations</u> (percent)	<u>Service</u> (percent)	<u>Estimated Construction Cost</u> (dollars)
Multiple-Purpose Structure No. 10A (Sherman)	11.33	88.67	460,000
Multiple-Purpose Structure No. 38 (Denison)	14.84	85.16	1,988,400
Basic Recreational Facilities	50.00	50.00	191,600
40 Single-Purpose Flood-water Retarding Structures	-	100.00	12,906,500
7 Grade Stabilization Structures	-	100.00	82,900

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9. Paragraph numbered 4 is modified to read as follows:

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

<u>Works of Improvement</u>	<u>Sponsoring Local Organizations</u> (percent)	<u>Service</u> (percent)	<u>Estimated Installation Services Cost</u> (dollars)
Multiple-Purpose Structure No. 10A (Sherman)	11.33	88.67	29,900
Multiple-Purpose Structure No. 38 (Denison)	-	100.00	117,500
Basic Recreational Facilities	50.00	50.00	18,200
40 Single-Purpose Flood-water Retarding Structures	-	100.00	949,000
7 Grade Stabilization Structures	-	100.00	23,700

10. Paragraph numbered 5 is modified to read as follows:

The Sponsoring Local Organization and the Service will each bear the costs of project administration which it incurs, estimated to be \$108,200 and \$2,017,000, respectively.

11. Paragraph number 17 is added to the Plan Agreement in accordance with the certification regarding drug-free workplace requirements (7 CFR 3017, Subpart F).

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 SCS, 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:

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(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 SCS 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.

12. Paragraph Number 18 is added to the Plan Agreement in accordance with the certification regarding lobbying (7 CFR 3018 - applicable if this agreement exceeds \$100,000).

(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.

13. Paragraph Number 19 is added to the Plan Agreement in accordance with the certification regarding debarment, suspension, and other responsibility matters - primary covered transactions (7 CFR 3017).

(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, such prospective participant shall attach an explanation to this agreement.

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

Choctaw Watershed Water Improvement District  
Local Organization

By Jan Washburn

Title President

Address Rt Box 731 DENISON 75020  
Zip Code

Date 12-6-93

The signing of this agreement was authorized by a resolution of the governing body of the Choctaw Watershed Water Improvement District Local Organization

adopted at a meeting held on 12-6-1993

Paul Lattin  
(Secretary, Local Organization)  
Address RT-Box 280 75090 *Sharon Lee*  
Zip Code  
Date 12-6-1993

Upper Elm-Red Soil and Water Conservation District  
Local Organization

By William Hermes

Title Chairman

Address 406-B W. Lamar, Sherman TX 75090  
Zip Code

Date 12/27/93

The signing of this agreement was authorized by a resolution of the governing body of the Upper Elm-Red Soil & Water Conservation District Local Organization

adopted at a meeting held on December 27, 1993

Charles Anderson  
(Secretary, Local Organization)  
*District Club*  
Address 406-B W. Lamar, Sherman TX 75090  
Zip Code  
Date 12/28/93

Grayson County Commissioners Court  
Local Organization

By Horace Groff  
Title County Clerk Judge  
Address 100 W. Houston, Sherman 75091  
Zip Code  
Date December 6, 1993

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 December 6, 1993

Dora Johnson County Clerk  
(Secretary, Local Organization)

Address 100 W. Houston, Sherman, 75091  
Zip Code  
Date December 6, 1993

City of Sherman  
Local Organization

By Harry Reynolds  
Title Mayor of Sherman  
Address 400 N. Ruak Sherman Tx 75091  
Zip Code  
Date December 6, 1993

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

adopted at a meeting held on December 6, 1993

Y. Helen J. Friesel, City Clerk  
(Secretary, Local Organization)

Address 400 N. Ruak Sherman Tx 75091  
Zip Code  
Date December 7, 1993

City of Denison  
Local Organization

By

*B. M. News*

Title

*Mayor*

Address

*P.O. Box 347, Denison, TX 75020*

Zip Code

Date

*December 14, 1993*

The signing of this agreement was authorized by a resolution of the governing body of the

City of Denison  
Local Organization

adopted at a meeting held on

*December 13, 1993*

*Barbara D. Forrest, City Clerk*  
(Secretary, Local Organization)

Address *P.O. Box 347, Denison, TX 75020*  
Zip Code

Date *December 14, 1993*

City of Bells  
Local Organization

By

*Jeff Trucken*

Title

*Mayor of City of Bells*

Address

*P.O. Box 95 Bells, TX 75414*

Zip Code

Date

*November 7, 1993*

The signing of this agreement was authorized by a resolution of the governing body of the

City of Bells  
Local Organization

adopted at a meeting held on

*12-07-93*

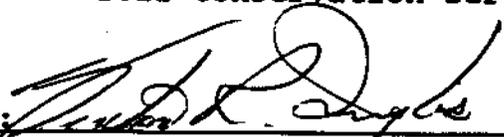
*[Signature]*  
(Secretary, Local Organization)

Address *P.O. Box 95 Bells, TX 75414*  
Zip Code

Date

*12-07-93*

United States Department of Agriculture  
Soil Conservation Service

Approved By:  **ACTING**  
(State Conservationist)

Date JAN 4 1994

**SUPPLEMENTAL WATERSHED PLAN NO. IV**

**CHOCTAW CREEK WATERSHED  
Grayson County, Texas**

November 1993

**NEED FOR SUPPLEMENT**

Since the original watershed agreement became effective on the 10<sup>th</sup>. day of October, 1966, it has become necessary to modify the watershed plan, as supplemented, for Choctaw Creek watershed to make the following changes:

1. Delete multiple-purpose structures Nos. 1, 4, 30, and 35 and floodwater retarding structures No. 2 and No. 6.
2. Add floodwater retarding structures Nos. 1A, 1B, 1C, 2A, 4 Rev., 30 Rev., and 35 Rev.
3. Delete the City of Bells as a sponsor. They will have no responsibility for any part of the watershed project.
4. Delete all of the stream channel improvement.
5. Delete all of the drainage mains and laterals.
6. Add Drug free, Lobby, and Debarment certifications.

The following are changes and modifications made in appropriate parts of the watershed plan.

Basis for Project Formulation

Since the original watershed plan was prepared, the City of Bells has determined that it will be unable to fulfill its financial responsibilities for the inclusion of municipal water supply capacity in multiple-purpose structure No. 30. The city believes that its present source of water will be sufficient for the near future. They tentatively plan on buying water from other sources when they need additional water.

The City of Sherman has determined that alternate water sources, not available during original plan preparation, will now meet the city's municipal water and recreation needs more effectively than multiple-purpose structures Nos. 1, 4 and 35.

Changes in design criteria, increased construction costs, and environmental concerns have made the installation of planned channel improvement unfeasible.

Floodwater retarding structure No. 2A has 0.11 square miles (0.28 square kilometers) less drainage area controlled than structure No. 2 and provides essentially the same level of protection. The land rights are more readily obtainable at a lesser cost.

Environmental concerns and changes in the plan of operations of many farm operators in the lower portion of the evaluation reach 1 have reduced the need and desirability of installing planned drainage mains and laterals. These items are no longer viable measures.

The landrights for floodwater retarding structure No. 6 cannot be obtained and there is no alternate site.

Works of Improvement To Be Installed

The works of improvement to be installed will change to 40 floodwater retarding structures, 2 multiple-purpose structures, 7 grade stabilization structures.

Explanation of Installation Costs

The total installation costs of the structural measures (including recreation facilities) is estimated to be \$20,336,980, of which Public Law 566 costs will be \$18,383,500 and the local share will be \$1,953,480. The Public Law 566 costs consist of \$15,186,400 for construction, \$1,125,800 for engineering services, \$37,800 for land rights, \$16,500 for relocation payments, and \$2,017,000 for project administration. The local costs consist of \$443,000 for construction, \$12,500 for engineering services, \$1,367,380 for land rights, \$1,300 for water rights, \$21,100 for relocation payments, and \$108,200 for project administration.

The cost of acquiring the land rights was revised to reflect current land values.

Effects of Works of Improvement

The deletion of multiple-purpose structures Nos. 1, 4, 30, and 35 will eliminate the opportunity for any beneficial use of the planned storage capacity for municipal and industrial water.

The deletion of the drainage mains and laterals will cause the monetary benefits expected to accrue to be lost to the project and leave the 260 acres (105.2 hectares) of wetland unchanged by the project action.

The deletion of the channel improvement and the loss of 2.81 square miles (1.14 square kilometers) of drainage area control caused by the deletion of floodwater retarding structure No. 6 and substituting No.'s 1A, 1B, 1C and 2A for 1 & 2 will result in a minor change in the effect of the project on reducing damage by floodwater. Percent reduction in flood damage will be changed from 82 percent to 81 percent.

Project Benefits

The estimated average annual monetary damage reduction for crop and pasture damages; other agricultural damages (such as loss of fences, farming equipment, livestock, and other property); road and bridge damage; urban damage in the city of Sherman; overbank deposition of damaging sediment upon flood plain soils; channel deposition damage; flood plain scour damages; and valley trenching damage is listed in revised table 5.

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The multiple-purpose structures with associated recreational facilities will produce approximately \$601,800 in annual benefits to residents of the area.

The average annual floodwater, sediment, and erosion damage reduction in the benefited area for each evaluation reach is shown in the following tabulation:

Evaluation Reach	Without Project (dollars)*	With Project (dollars)*	Reduction (percent)
1	456,300	106,300	77
2	85,600	23,800	72
3	57,000	11,000	81
4	23,300	12,800	45
5	285,200	16,500	94
6	33,700	7,300	78
7	9,500	5,500	42
Total	950,600	183,200	81

\* Current normalized prices April 27, 1993 for agricultural commodities and 1992 for nonagricultural damages.

Comparison of Benefits and Costs

The total average annual cost of structural measures and basic recreational facilities (amortized total installation cost and project administration, plus operation, maintenance, and replacement) is \$691,500. These measures are expected to produce average annual primary benefits of \$1,372,300. The benefit-cost ratio is 2.0 to 1.

Project Installation

The Choctaw Watershed Water Improvement District and the Grayson County Commissioners Court will assume the same responsibilities for floodwater retarding structures Nos. 1A, 1B, 1C, 4 Rev., 30 Rev., and 35 Rev. as they have for the other single-purpose floodwater retarding structures except No. 11. The City of Bells will no longer have any responsibilities for the installation of any part of the project.

**Financing Project Installation**

The Choctaw Watershed Water Improvement District and the Grayson County Commissioners Court will assume the same responsibilities for floodwater retarding structures Nos. 1A, 1B, 1C, 4 Rev., 30 Rev., and 35 Rev. as they have for the other single-purpose floodwater retarding structures except No. 11. The City of Bells will no longer be responsible for financing any part of the project.

**Provisions for Operation and Maintenance**

The Choctaw Watershed Water Improvement District and Grayson County will assume the responsibilities for operation and maintenance of floodwater retarding structures Nos. 1A, 1B, 1C, 4 Rev., 30 Rev., and 35 Rev. The City of Bells will no longer have any operation and maintenance responsibilities for any works of improvement included in the watershed plan.

The average annual cost of operation and maintenance of all structural measures is estimated to be \$20,900. This includes replacement costs of \$2,400 for basic recreational facilities and for any structural or appurtenance requiring replacement before the end of the 100-year evaluation period.

***TABLES***

**REVISED TABLE 1 - ESTIMATED PROJECT INSTALLATION COST**  
Choctaw Creek Watershed, Texas

Installation Cost Item	Unit	Number To Be Applied	Estimated Cost Dollars (1)		
			Public Law 566 Funds SCS (2)	Other Funds	Total
<b>LAND TREATMENT</b>					
Cropland	Acre (Ha.)	40,138 (16,243)	-	1,805,300	1,805,300
Grassland	Acre (Ha.)	92,902 (37,597)	-	8,465,200	8,465,200
Technical Assistance			72,800	492,100	564,900
SCS Subtotal			72,800	10,762,600	10,835,400
<b>TOTAL LAND TREATMENT</b>			<b>72,800</b>	<b>10,762,600</b>	<b>10,835,400</b>
<b>STRUCTURAL MEASURES</b>					
Construction Floodwater Retarding Structures	No.	40	12,906,500	-	12,906,500
Grade Stabilization Structures	No.	7	82,900	-	82,900
Multiple-Purpose Structures	No.	2	2,101,200	347,200	2,448,400
Basic Recreational Facilities	No.	1	95,800	95,800	191,600
Subtotal - Construction			15,186,400	443,000	15,629,400
Engineering Services (3)			1,125,800	12,500	1,138,300

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**REVISED TABLE 1 - ESTIMATED PROJECT INSTALLATION COST - Continued**  
 Choctaw Creek Watershed, Texas

Installation Cost Item	Unit	Number To Be Applied	Estimated Cost Dollars (1)		
			Public Law 566 Funds SCS (2)	Other Funds	Total
<u>Relocation Payments</u>			16,500	21,100	37,600
<u>Project Administration</u>					
Relocation Advisory Assistance Services			-	3,700	3,700
Other			2,017,000	104,500	2,125,200
Subtotal - Project Administration			2,017,000	108,200	2,125,200
<u>Other Costs</u>					
Land Rights			37,800	1,367,380	1,405,180
Water Rights			-	1,300	1,300
Subtotal - Other Costs			37,800	1,368,680	1,406,480
<b>TOTAL STRUCTURAL MEASURES</b>			18,383,500	1,953,480	20,336,980
<b>TOTAL PROJECT</b>			18,456,300	12,716,080	31,172,380

- (1) Price Base: 1991.
- (2) Federal agency responsible for assisting in installation of works of improvement.
- (3) Includes construction inspection.

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REVISED TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION  
Choctaw Creek Watershed, Texas  
(Continued)

(Dollars) \*1

Item	Installation Cost - Public Law 566 Funds				Installation Cost - Other Funds				Total Installation Cost
	Construction	Engineering	Land Rights	Relocation Payments 2	Construction	Engineering	Land Rights	Relocation Payments 2	
Subtotal - Floodwater Retarding Structures Multiple Purpose	12,908,500	949,000	-	11,300	13,868,800	-	1,299,388	14,500	15,180,688
Subtotal - Site 10A	407,900	28,500	-	-	434,400	3,400	28,800	-	517,300
36 Basic Recreational Facilities	1,683,300	117,500	37,800	5,200	1,953,800	-	40,100	6,600	2,198,300
Subtotal - Site 38	95,600	9,100	-	-	104,900	9,100	-	-	209,800
Subtotal - Multiple Purpose Structures Grade Stabilization	1,789,100	126,600	37,800	5,200	1,958,700	9,100	40,100	6,600	2,406,100
Subtotal - Structures (Constructed)	2,197,000	153,100	37,800	5,200	2,393,100	12,500	66,900	8,600	2,923,400
101 Subtotal - Grade Stabilization Structures (Constructed)	19,000	6,100	-	-	25,100	-	330	-	25,430
102 Subtotal - Grade Stabilization Structures (Constructed)	28,400	6,500	-	-	35,900	-	270	-	36,170
Subtotal - Grade Stabilization Structures (Planned)	48,400	12,600	-	-	61,000	-	600	-	61,600
103 Subtotal - Grade Stabilization Structures (Planned)	7,100	2,300	-	-	9,400	-	100	-	9,500
104 Subtotal - Grade Stabilization Structures (Planned)	6,000	1,900	-	-	7,900	-	100	-	8,000
105 Subtotal - Grade Stabilization Structures (Planned)	7,700	2,500	-	-	10,200	-	100	-	10,300
106 Subtotal - Grade Stabilization Structures (Planned)	7,700	2,500	-	-	10,200	-	100	-	10,300
107 Subtotal - Grade Stabilization Structures (Planned)	6,000	1,900	-	-	7,900	-	100	-	8,000
Subtotal - Administration Project	34,500	11,100	-	-	45,600	-	500	-	46,100
Subtotal - Grade Stabilization Structures	82,900	23,700	-	-	106,600	-	1,100	-	107,700
Total - All Structural Measures	15,186,400	1,125,800	37,800	16,500	16,366,500	443,000	1,367,388	21,100	18,211,788
Administration Project	15,186,400	1,125,800	37,800	16,500	16,366,500	443,000	1,367,388	21,100	18,211,788
GRAND TOTAL	15,186,400	1,125,800	37,800	16,500	16,366,500	443,000	1,367,388	21,100	18,211,788

\*1 Price Base: 1991 for all structures.

\*2 Relocation payments for displacements prior to July 1, 1972, will be shared as provided in Public Law 91-646 and in paragraph numbered 1 of Supplemental Watershed Work Plan Agreement No. 3.

\*3 Structures reviewed by Supplemental IV

REVISED TABLE 2A - COST ALLOCATION AND COST SHARING SUMMARY

Choctaw Creek Watershed, Texas  
(Dollars) (1)

Item	COST ALLOCATION				COST SHARING								
	Purpose				Public Law 566		Other		Total				
	Flood Prevention	Recreation	Drainage	Total	Flood Prevention	Recreation	Drainage	Public Law 566	Flood Prevention	Recreation	Drainage	Other	Total
<b>Single Purpose Structures</b>													
40 Floodwater Retarding Structures and 3 Ombi Stabilization Structures													
Construction	12,989,400	-	-	12,989,400	12,989,400	-	-	-	-	-	-	-	-
Engineering	972,700	-	-	972,700	972,700	-	-	-	-	-	-	-	-
Relocations	23,900	-	-	23,900	23,900	-	-	-	-	-	-	-	-
Land Rights	1,300,680	-	-	1,300,680	1,300,680	-	-	-	14,500	-	-	-	14,500
Project Administration	1,820,400	-	-	1,820,400	1,735,500	-	-	-	1,300,680	-	-	-	1,300,680
Subtotal	17,106,780	-	-	17,106,780	15,726,900	-	-	-	1,381,880	-	-	-	1,381,880
<b>Multiple Purpose Structure No. 10A</b>													
Construction	407,900	52,100	-	460,000	407,900	-	-	-	-	-	-	52,100	52,100
Engineering	24,300	3,400	-	27,700	26,500	-	-	-	-	-	-	3,400	3,400
Land Rights	24,100	2,700	-	26,800	24,100	-	-	-	24,100	-	-	2,700	26,800
Water Rights	-	600	-	600	-	-	-	-	-	-	-	600	600
Project Administration	50,200	3,600	-	53,800	44,500	5,000	-	-	5,700	-	-	600	6,300
Subtotal - Structure 10A	508,700	64,400	-	573,100	478,900	3,000	-	-	29,800	-	-	59,400	89,200
<b>Multiple Purpose Structure No. 38</b>													
Construction	1,398,000	590,400	-	1,988,400	1,398,000	295,300	-	-	-	-	-	295,300	295,300
Engineering	82,600	34,900	-	117,500	82,600	34,900	-	-	-	-	-	-	117,500
Relocations	9,300	3,500	-	12,800	3,700	1,500	-	-	4,600	-	-	-	6,200
Land Rights	-	73,900	-	73,900	-	37,800	-	-	-	-	-	-	40,100
Water Rights	-	700	-	700	-	-	-	-	-	-	-	700	700
Project Administration	165,100	69,800	-	234,900	141,100	60,400	-	-	23,400	-	-	10,000	76,900
Subtotal - Structure 38	1,654,000	777,200	-	2,431,200	1,625,400	429,900	-	-	28,000	-	-	347,900	1,998,300
<b>Basic Recreational Facilities - Site 38</b>													
Construction	-	191,600	-	191,600	-	93,800	-	-	-	-	-	93,800	93,800
Engineering	-	18,200	-	18,200	-	9,100	-	-	-	-	-	9,100	9,100
Project Administration	-	14,100	-	14,100	-	15,500	-	-	-	-	-	1,600	1,600
Subtotal - Recreational Facilities	-	223,900	-	223,900	-	117,400	-	-	-	-	-	106,500	106,500
<b>TOTAL</b>	19,221,480	1,063,500	-	20,284,980	17,831,200	532,300	-	-	1,439,680	-	-	317,800	1,934,480

(1) Price Base: 1991

**TABLE 2B - RECREATIONAL FACILITIES  
ESTIMATED CONSTRUCTION COSTS**

Choctaw Creek Watershed, Texas

Item	Number	Unit Cost (dollars) <sup>1</sup>	Construction Cost (dollars) <sup>1</sup>
Pavilion	1	-	46,400
Bait Shop / Concessions	1	-	47,200
Restrooms / Storage	240 sq. ft.	-	25,700
Playgrounds	-	-	17,500
Boat Ramps (1-Lane)	1	-	15,400
Boat Dock	1	-	14,300
Fishing Pier	1	-	5,200
Barbecue Grills	-	-	1,900
Obstacle Course	1	-	9,200
Miscellaneous and Contingencies	-	-	8,800
<b>TOTAL</b>			<b>191,600</b>

<sup>1</sup> Price Base: 1991

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REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 1A
Class of Structure		a
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	4.32
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	4.32
Runoff Curve Number (1-Day) Avg. AMC II		81
Time of Concentration ( $T_c$ )	Hours	1.66
Elevation Top of Dam	Feet	756.1
Elevation Crest Emergency Spillway	Feet	751.8
Elevation Crest Principal Spillway	Feet	731.5
Elevation Lowest Ungated Outlet	Feet	731.5
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	180
Emergency Spillway Exit Channel Slope	%	11.3
Maximum Height of Dam	Feet	46
Volume of Fill	Cu. Yd.	147,300
Total Capacity (1)	Ac. Ft.	1306
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	145
Sediment Submerged	Ac. Ft.	145
Sediment Aerated	Ac. Ft.	17
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	1144
Surface Area		
Lowest Ungated Outlet	Acres	23
Sediment Pool	Acres	23
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	103
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	7.95
Rainfall Volume (10-Day)	Inches	13.30
Runoff Volume (10-Day)	Inches	8.64
Capacity (Maximum)	C.F.S.	114
Dimensions of Conduit	Inches	30
Frequency Operation Emergency Spillway	%	3.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	8.18
Runoff Volume	Inches	5.91
Storm Duration	Hours	6
Velocity of Flow ( $V_e$ )	Ft/Sec.	5.80
Maximum Water Surface Elevation	Feet	752.9
Freeboard Hydrograph		
Rainfall Volume	Inches	12.78
Runoff Volume	Inches	10.34
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	756.1
Discharge per Foot of Width ( $O_e/b$ )	Ac. Ft.	6.1
Bulk Length	Feet	440
Capacity Equivalents		
Sediment Volume	Inches	0.70
Floodwater Retarding Volume	Inches	4.96
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway

(2) Volume included in sediment submerged (100 yr).

REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 1B
Class of Structure		a
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	2.89
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	2.89
Runoff Curve Number (1-Day) Avg. AMC II		81
Time of Concentration ( $T_c$ )	Hours	1.44
Elevation Top of Dam	Feet	776.3
Elevation Crest Emergency Spillway	Feet	770.8
Elevation Crest Principal Spillway	Feet	751.5
Elevation Lowest Ungated Outlet	Feet	751.5
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	120
Emergency Spillway Exit Channel Slope	%	12.0
Maximum Height of Dam	Feet	47
Volume of Fill	Cu. Yd.	145,300
Total Capacity (1)	Ac. Ft.	901
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	119 (2)
Sediment Submerged	Ac. Ft.	119
Sediment Aerated	Ac. Ft.	9
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	773
Surface Area		
Lowest Ungated Outlet	Acres	17
Sediment Pool	Acres	17
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	74
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	7.90
Rainfall Volume (10-Day)	Inches	13.30
Runoff Volume (10-Day)	Inches	8.64
Capacity (Maximum)	C.F.S.	70
Dimensions of Conduit	Inches	24
Frequency Operation Emergency Spillway	%	3.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	8.18
Runoff Volume	Inches	5.91
Storm Duration	Hours	6
Velocity of Flow ( $V_e$ )	Ft/Sec.	5.54
Maximum Water Surface Elevation	Feet	771.9
Freeboard Hydrograph		
Rainfall Volume	Inches	12.78
Runoff Volume	Inches	10.34
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	776.3
Discharge per Foot of Width ( $O_e/b$ )	Ac. Ft.	6.0
Bulk Length	Feet	300
Capacity Equivalents		
Sediment Volume	Inches	0.84
Floodwater Retarding Volume	Inches	5.10
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged (100 yr).

**REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY**  
**Choctaw Creek Watershed, Texas**

Item	Unit	Structure Number 1C
Class of Structure		a
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	1.93
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	1.93
Runoff Curve Number (1-Day) Avg. AMC II		81
Time of Concentration (T <sub>c</sub> )	Hours	0.90
Elevation Top of Dam	Feet	757.2
Elevation Crest Emergency Spillway	Feet	754.2
Elevation Crest Principal Spillway	Feet	739.5
Elevation Lowest Ungated Outlet	Feet	739.5
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	100
Emergency Spillway Exit Channel Slope	%	9.7
Maximum Height of Dam	Feet	35
Volume of Fill	Cu. Yd.	59,700
Total Capacity (1)	Ac. Ft.	517
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	79
Sediment Submerged	Ac. Ft.	79
Sediment Aerated	Ac. Ft.	9
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	429
Surface Area		
Lowest Ungated Outlet	Acres	12
Sediment Pool	Acres	12
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	51
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	7.40
Rainfall Volume (10-Day)	Inches	12.50
Runoff Volume (10-Day)	Inches	7.91
Capacity (Maximum)	C.F.S.	63
Dimensions of Conduit	Inches	24
Frequency Operation Emergency Spillway	%	3.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	6.80
Runoff Volume	Inches	4.62
Storm Duration	Hours	6
Velocity of Flow (V <sub>e</sub> )	Ft/Sec.	3.10
Maximum Water Surface Elevation	Feet	754.5
Freeboard Hydrograph		
Rainfall Volume	Inches	9.65
Runoff Volume	Inches	7.23
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	756.7
Discharge per Foot of Width (O <sub>e</sub> /b)	Ac. Ft.	2.5
Bulk Length	Feet	255
Capacity Equivalents		
Sediment Volume	Inches	0.77
Floodwater Retarding Volume	Inches	4.17
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged (100 yr).

REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 2A
Class of Structure		b
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	1.24
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	1.24
Runoff Curve Number (1-Day) Avg. AMC II		78
Time of Concentration ( $T_c$ )	Hours	0.79
Elevation Top of Dam	Feet	803.4
Elevation Crest Emergency Spillway	Feet	799.4
Elevation Crest Principal Spillway	Feet	790.6
Elevation Lowest Ungated Outlet	Feet	790.6
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	100
Emergency Spillway Exit Channel Slope	%	7.1
Maximum Height of Dam	Feet	37
Volume of Fill	Cu. Yd.	87,400
Total Capacity (1)	Ac. Ft.	475
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	171 (2)
Sediment Submerged	Ac. Ft.	171
Sediment Aerated	Ac. Ft.	24
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	280
Surface Area		
Lowest Ungated Outlet	Acres	21
Sediment Pool	Acres	21
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	48
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	8.40
Rainfall Volume (10-Day)	Inches	14.09
Runoff Volume (10-Day)	Inches	8.71
Capacity (Maximum)	C.F.S.	65
Dimensions of Conduit	Inches	24
Frequency Operation Emergency Spillway	%	2.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	9.56
Runoff Volume	Inches	6.85
Storm Duration	Hours	6
Velocity of Flow ( $V_e$ )	Ft/Sec.	6.70
Maximum Water Surface Elevation	Feet	801.0
Freeboard Hydrograph		
Rainfall Volume	Inches	16.00
Runoff Volume	Inches	13.05
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	803.3
Discharge per Foot of Width ( $O_e/b$ )	Ac. Ft.	5.1
Bulk Length	Feet	250
Capacity Equivalents		
Sediment Volume	Inches	2.94
Floodwater Retarding Volume	Inches	4.23
Recreation Volume	Inches	-

- (1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged.

REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 4 Rev.
Class of Structure		a
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	7.27
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	7.27
Runoff Curve Number (1-Day) Avg. AMC II		78
Time of Concentration (T <sub>c</sub> )	Hours	2.32
Elevation Top of Dam	Feet	711.4
Elevation Crest Emergency Spillway	Feet	706.5
Elevation Crest Principal Spillway	Feet	693.4
Elevation Lowest Ungated Outlet	Feet	684.5
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	150
Emergency Spillway Exit Channel Slope	%	6.8
Maximum Height of Dam	Feet	49
Volume of Fill	Cu. Yd.	230,900
Total Capacity (1)	Ac. Ft.	2,764
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	114
Sediment Submerged	Ac. Ft.	729
Sediment Aerated	Ac. Ft.	100
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	1,935
Surface Area		
Lowest Ungated Outlet	Acres	33
Sediment Pool	Acres	102
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	213
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	7.90
Rainfall Volume (10-Day)	Inches	13.30
Runoff Volume (10-Day)	Inches	8.01
Capacity (Maximum)	C.F.S.	126
Dimensions of Conduit	Inches	30
Frequency Operation Emergency Spillway	%	3.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	8.18
Runoff Volume	Inches	5.56
Storm Duration	Hours	6
Velocity of Flow (V <sub>e</sub> )	Ft/Sec.	3.77
Maximum Water Surface Elevation	Feet	707.1
Freeboard Hydrograph		
Rainfall Volume	Inches	12.78
Runoff Volume	Inches	9.92
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	711.2
Discharge per Foot of Width (O <sub>e</sub> /b)	Ac. Ft.	11.0
Bulk Length	Feet	300
Capacity Equivalents		
Sediment Volume	Inches	2.14
Floodwater Retarding Volume	Inches	4.99
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged.

REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 30 Rev.
Class of Structure		a
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	2.11
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	2.11
Runoff Curve Number (1-Day) Avg. AMC II		78
Time of Concentration (T <sub>c</sub> )	Hours	0.97
Elevation Top of Dam	Feet	677.5
Elevation Crest Emergency Spillway	Feet	674.5
Elevation Crest Principal Spillway	Feet	664.9
Elevation Lowest Ungated Outlet	Feet	660.7
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	100
Emergency Spillway Exit Channel Slope	%	5.0
Maximum Height of Dam	Feet	37
Volume of Fill	Cu. Yd.	103,100
Total Capacity (1)	Ac. Ft.	775
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	149
Sediment Submerged	Ac. Ft.	292
Sediment Aerated	Ac. Ft.	45
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	438
Surface Area		
Lowest Ungated Outlet	Acres	24
Sediment Pool	Acres	38
Recreation Pool	Acres	-
Floodwater Retarding Pool (1)	Acres	63
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	7.50
Rainfall Volume (10-Day)	Inches	12.50
Runoff Volume (10-Day)	Inches	7.30
Capacity (Maximum)	C.F.S.	65
Dimensions of Conduit	Inches	24
Frequency Operation Emergency Spillway	%	4.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	6.85
Runoff Volume	Inches	4.34
Storm Duration	Hours	6
Velocity of Flow (V <sub>e</sub> )	Ft/Sec.	2.35
Maximum Water Surface Elevation	Feet	674.8
Freeboard Hydrograph		
Rainfall Volume	Inches	9.60
Runoff Volume	Inches	6.89
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	676.9
Discharge per Foot of Width (O <sub>e</sub> /b)	Ac. Ft.	2.6
Bulk Length	Feet	270
Capacity Equivalents		
Sediment Volume	Inches	3.00
Floodwater Retarding Volume	Inches	3.89
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged.

REVISED TABLE 3 - STRUCTURAL DATA - STRUCTURES WITH PLANNED STORAGE CAPACITY  
Choctaw Creek Watershed, Texas

Item	Unit	Structure Number 35 Rev.
Class of Structure		b
Seismic Zone		0
Uncontrolled Drainage Area	Sq. Mi.	8.50
Controlled Drainage Area	Sq. Mi.	0
Total Drainage Area	Sq. Mi.	8.50
Runoff Curve Number (1-Day) Avg. AMC II		77
Time of Concentration ( $T_c$ )	Hours	1.70
Elevation Top of Dam	Feet	688.3
Elevation Crest Emergency Spillway	Feet	682.1
Elevation Crest Principal Spillway	Feet	665.7
Elevation Lowest Ungated Outlet	Feet	663.0
Emergency Spillway Type		Veg.
Emergency Spillway Bottom Width	Feet	220
Emergency Spillway Exit Channel Slope	%	3.0
Maximum Height of Dam	Feet	43
Volume of Fill	Cu. Yd.	266,940
Total Capacity (1)	Ac. Ft.	2,622
Sediment Submerged (Low Ungated Outlet)	Ac. Ft.	121 (2)
Sediment Submerged	Ac. Ft.	245
Sediment Aerated	Ac. Ft.	27
Recreation Use	Ac. Ft.	-
Floodwater Retarding	Ac. Ft.	2,350
Surface Area		
Lowest Ungated Outlet	Acres	34
Sediment Pool	Acres	55
Recreation Pool	Acres	-
Floodwater Retarding Pool	Acres	250
Principal Spillway Design		
Rainfall Volume (1-Day)	Inches	8.40
Rainfall Volume (10-Day)	Inches	14.10
Runoff Volume (10-Day)	Inches	8.56
Capacity (Maximum)	C.F.S.	184
Dimensions of Conduit	Inches	36
Frequency Operation Emergency Spillway	%	2.0
Emergency Spillway Hydrograph		
Rainfall Volume	Inches	9.56
Runoff Volume	Inches	6.72
Storm Duration	Hours	6
Velocity of Flow ( $V_e$ )	Ft/Sec.	5.43
Maximum Water Surface Elevation	Feet	684.0
Freeboard Hydrograph		
Rainfall Volume	Inches	16.00
Runoff Volume	Inches	12.90
Storm Duration	Hours	6
Maximum Water Surface Elevation	Feet	688.1
Discharge per Foot of Width ( $O_e/b$ )	Ac. Ft.	14.2
Bulk Length	Feet	550
Capacity Equivalents		
Sediment Volume	Inches	0.60
Floodwater Retarding Volume	Inches	5.18
Recreation Volume	Inches	-

(1) Crest of Emergency Spillway  
(2) Volume included in sediment submerged.

**REVISED TABLE 4 - ANNUAL COST**  
 Choctaw Creek Watershed, Texas

(Dollars)<sup>1</sup>

Evaluation Unit	Amortization of Installation Cost	Operation and Maintenance Cost	Total
40 Floodwater Retarding Structures; Multiple-Purpose Structures 10A and 38, including Basic Recreation Facilities; and 7 Grade Stabilization Structures	2 670,600	3 20,900	691,500

1 Price Base: 1991 for all structural measures.

2 Amortized for 100 years at 3.125 percent, except for floodwater retarding structures Nos. 1A, 1B, 1C, 4 Rev., 13B, 30 Rev., 34A, and 35 Rev., which are amortized at 3.250 percent.

3 Includes replacement costs of \$2,400 for basic recreation facilities and for any structure or appurtenance requiring replacement before end of 100-year evaluation period.

November 1993

Supplement No. IV - Choctaw Creek Watershed - Grayson County, Texas

**REVISED TABLE 5 -  
ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS  
Choctaw Creek Watershed, Texas  
(Dollars)<sup>1</sup>**

Item	Est. Ave. Annual Damage		Reduction Benefit
	Without Project	With Project	
Floodwater Crop and Pasture	297,200	86,700	210,500
Other Agricultural	121,300	34,500	86,800
Nonagricultural Road and Bridge	110,400	9,100	101,300
Urban	267,200	15,000	252,200
Subtotal	796,100	145,300	650,800
Sediment Overbank Deposition	5,700	2,400	3,300
Channel Deposition	5,000	2,800	2,200
Subtotal	10,700	5,200	5,500
Erosion Flood Plain Scour	54,100	13,400	40,700
Valley Trenching	3,300	2,700	600
Subtotal	57,400	16,100	41,300
Indirect	86,400	16,600	69,800
<b>TOTAL</b>	<b>950,600</b>	<b>183,200</b>	<b>767,400</b>

<sup>1</sup> Price Base: Current normalized prices (April 27, 1993) for agricultural commodities and 1992 for nonagricultural damage.

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**REVISED TABLE 6 -  
COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES**  
Choctaw Creek Watershed, Texas

(Dollars)

Evaluation Unit	AVERAGE ANNUAL BENEFITS <sup>1</sup>				Benefit Cost Ratio	
	Flood Prevention		Nonagricultural Water Management			Average Annual Cost <sup>2</sup>
	Damage Reduction	Intensification	Recreation	Total		
40 Floodwater Retarding Structures; Multiple-Purpose Structures 10A and 38, including Basic Recreation Facilities; and 7 Grade Stabilization Structures <sup>3</sup>	767,400	3,100	601,800	1,372,300	2.0:1.0	

<sup>1</sup> Price Base: Current normalized prices (April 27, 1993) for agricultural commodities and 1992 for nonagricultural benefits.

<sup>2</sup> From revised table 4.

<sup>3</sup> Interrelated measures.