

**SUPPLEMENTAL WATERSHED
AND
AGREEMENT PLAN NO. III**

for
UPPER PECAN BAYOU WATERSHED
Middle Colorado River Watershed
Brown, Callahan, Coleman, Eastland,
and Taylor Counties, Texas

by

U.S. Department of Agriculture
Soil Conservation Service
Temple, Texas

February 1994

SUPPLEMENTAL WATERSHED AND AGREEMENT PLAN NO. III

FOR

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Temple, Texas

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INTRODUCTION

The plan for watershed protection and flood prevention for the Upper Pecan Bayou Watershed became effective on February 5, 1966. The plan was prepared by the local sponsoring organizations with technical assistance from the Soil Conservation Service. The U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department assisted in preparation of the fish and wildlife aspects of the watershed plan. Financial assistance for development of the plan was provided by the Texas State Soil and Water Conservation Board and the Soil Conservation Service.

Upper Pecan Bayou Watershed is that portion of Pecan Bayou and its tributaries located above Lake Brownwood, excluding those areas drained by Jim Ned and Turkey Creeks. The watershed comprises an area of 445,760 acres (180,393 hectares). It is located in the Colorado River Basin in Brown, Callahan, Coleman, Eastland, and Taylor Counties of Texas. In 1964, the main resource problems in the watershed were frequent floodwater, sediment, and scour damages on about 29,621 acres (11,987 hectares) of intensively managed agricultural land. The local sponsoring organization determined that the city of Clyde, Texas was interested in including additional water storage and other related works of improvements for municipal and industrial water supply, and to develop a recreational area with needed basic facilities.

The plan to address these problems was to install 32 floodwater retarding structures and one multiple-purpose structure with flood prevention, municipal and industrial water supply, and recreation as its purposes, and one set of basic recreational facilities.

The plan has been supplemented two times since 1966. The supplements addressed the following items:

Supplement I - Comply with provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1979.

Supplement II - provided for the use of flood prevention funds on a cost-share basis to install land treatment measures to control and stabilize critical sediment source areas.

Various other letters and memos have made additions and corrections to the watershed plan.

Actions to date include the installation of 24 floodwater retarding structures and one multiple-purpose structure with a municipal water outlet and basic recreational facilities and the planned land treatment. Also three floodwater retarding structures have been deleted and two additional floodwater retarding structures have been added by letter change and minor revisions since the approval of the original plan. Other minor changes have occurred such as moving sites slightly from their original location. Installation of these measures have reduced the resource problems in most of the watershed. The purpose of this supplement is to further modify the plan at the request of the sponsoring local organizations. This supplement will change the following items in the watershed plan:

1. Delete five floodwater retarding structures Nos. 8, 13, 14, 17, and 18;
2. Modification and renumbering of floodwater retarding structures Nos. 15 and 16 to now be called 15 Rev. and 16 Rev.; and
3. Officially add the Callahan Divide SWCD as a local sponsor as they have assumed all obligations previously held by the Central Colorado SWCD and Lower Clear Fork of the Brazos SWCD on lands located in Callahan County due to the sponsors' reorganization.
4. Add required certifications on drug-free workplace, lobbying, and other matters.

The sponsors requested the deletion of the floodwater retarding structures because landrights cannot be obtained and there are no alternative sites available. Floodwater retarding structures 15 and 16 (now called 15 Rev. and 16 Rev.) have been modified to make the structures meet present design criteria. Site 16 Rev. will be moved downstream approximately 200 feet (60.96 meters). The movement of site 16 Rev. downstream will increase the drainage area from 20.78 square miles (53.82 km²) to 21.02 square miles (54.44 km²). Site 15 Rev. will remain in its present location. The two remaining structures will provide essentially the same level of protection as originally planned.

SUPPLEMENTAL WATERSHED AGREEMENT NO. III

UPPER PECAN BAYOU WATERSHED, TEXAS

Between the

PECAN BAYOU
~~Brown-Mills~~ Soil and Water Conservation District
Local Organization

Callahan Divide Soil and Water Conservation District
Local Organization

Central Colorado Soil and Water Conservation District
Local Organization

Lower Clear Fork of the Brazos Soil and Water Conservation
District
Local Organization

Middle Clear Fork Soil and Water Conservation District
Local Organization

Upper Leon Soil and Water Conservation District
Local Organization

The City of Clyde, Texas
Local Organization

Brown County Commissioners Court
Local Organization

Callahan County Commissioners Court
Local Organization

Coleman County Commissioners Court
Local Organization

Taylor County Commissioners Court
Local Organization

(hereinafter referred to as the Sponsors)

State of Texas

and the

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

Whereas, the watershed plan for Upper Pecan Bayou Watershed, State of Texas, executed by the Sponsors named therein and the SCS, became effective on the 5th day of February 1966; and

Whereas, a Supplemental Watershed Plan Agreement No. I executed by the Sponsors named therein and the SCS, became effective on the 18th day of October 1971; and

Whereas, a Supplemental Watershed Plan Agreement No. II executed by the Sponsors named therein and the SCS, became effective on the 12th day of January 1979; and

Whereas, in order to carry out the watershed plan for said watershed, it has become necessary to modify said watershed agreement as supplemented; and

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

Whereas, a Supplemental Watershed Plan No. III which modifies the watershed plan dated February 5, 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 agreement, as supplemented;

(1) Floodwater retarding structures Nos. 8, 13, 14, 17, and 18 are hereby deleted from the planned works of improvements.

(2) Floodwater retarding structures Nos. 15 and 16 will be modified to meet present criteria and renamed 15 Rev. and 16 Rev.

(3) Callahan Divide SWCD will be officially added as a local sponsor as they have assumed all obligations previously held by the Central Colorado SWCD and Lower Clear Fork of the Brazos SWCD on lands located in Callahan County due to the sponsors' reorganization.

(4) Paragraph numbered 1 is modified to read as follows:

Except as herein provided, the Sponsoring Local Organization will acquire without cost to the federal government such landrights as will be needed in connection with the works of improvement. (Estimated cost \$595,950). The percentage 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) |
|------------------------------------|---|-----------------------------|--|
| 26 Floodwater Retarding Structures | 100.0 | 0 | 439,400 |
| 1 Multiple-Purpose Structure | 57.3 | 42.7 | 154,050 |
| Basic Recreation Facilities | 50.0 | 50.0 | 34,000 |
| Legal Fees and Flowage Easements | 100.0 | 0 | 2,500 |

(5) Paragraph numbered 3 is modified to read as follows:

The percentages of construction cost of the structural works of improvement to be paid by the Sponsors and by the SCS are as follows:

| <u>Works of Improvement</u> | <u>Sponsors</u> (percent) | <u>SCS</u> (percent) | <u>Estimated Construction Cost</u> (dollars) |
|------------------------------------|------------------------------|-------------------------|---|
| 26 Floodwater Retarding Structures | 0.0 | 100.0 | 10,592,600 |
| 1 Multiple-purpose Structure | 34.4 | 65.6 | 973,525 |
| Municipal Water Outlet | 100.0 | 0.0 | 69,150 |
| Basic Recreation Facilities | 50.0 | 50.0 | 166,050 |

(6) Paragraph numbered 4 is modified to read:

The percentages of the cost for engineering and project administration to be borne by the Sponsors and by the SCS are as follows:

| <u>Works of Improvement</u> | <u>Sponsors</u> (percent) | <u>SCS</u> (percent) | <u>Estimated Engineering and Project Adm. Cost.</u> (dollars) |
|------------------------------------|------------------------------|-------------------------|--|
| 26 Floodwater Retarding Structures | 100.0 | 0.0 | 2,318,425 |
| 1 Multiple-purpose Structure | 22.9 | 77.1 | 155,250 1/ |
| Municipal Water Outlet | 100.0 | 0.0 | 5,000 |
| Basic Recreation Facilities | 50.0 | 50.0 | 25,000 |

1/ Does not include project administration for both the Service and Sponsors for a total of \$69,125.

(7). Paragraph Number 12 is added to the plan agreement in accordance with the certification regarding drug-free workplace requirements (7CFR 3017, Subpart F) as follows:

By signing this watershed agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the 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:

(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.

(8). Paragraph Number 13 is added to the plan agreement in accordance with the certification regarding lobbying (7 CFR 3018) as follows:

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

(a) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection

with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(c) The sponsors shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

(9). Paragraph Number 14 is added to the plan agreement in accordance with the certification regarding debarment, suspension, and other responsibility matters - primary covered transactions (7 CFR 3017) as follows:

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

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

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

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

PECAN BAYOU
~~Brown Mills~~ Soil and Water Conservation District
Local Organization

By *O. B. Boyd*
Title CHAIRMAN
3-17-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the PECAN BAYOU ~~Brown Mills~~ Soil and Water Conservation District adopted at a meeting held on MARCH 17, 1994.

Billy Clark
(Secretary, Local Organization)

Callahan Divide Soil and Water Conservation District
Local Organization

By *H. Franklin*
Title Chairman
2-15-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Callahan Divide Soil and Water Conservation District adopted at a meeting held on 2-15-94.

Kenneth M. George
(Secretary, Local Organization)

Central Colorado Soil and Water Conservation District
Local Organization

BY Harold Phillips

Title 5-10-94 Chm.

5-10-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Central Colorado Soil and Water Conservation District adopted at a meeting held on 5-10-94.

Johany Jamison
(Secretary, Local Organization)

Lower Clear Fork Of The Brazos Soil and Water Conservation District
Local Organization

BY Tommy J. Hailey

Title Chm.

7/25/94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Lower Clear Fork of the Brazos Soil and Water Conservation District adopted at a meeting held on 7-25-94.

A. J. Moore
(Secretary, Local Organization)

Middle Clear Fork Soil and Water Conservation District
Local Organization

BY Paul Holloway
Title Chairman
6/2/94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Middle Clear Fork Soil and Water Conservation District adopted at a meeting held on 6/2/94.

Paul Holloway
(Secretary, Local Organization)

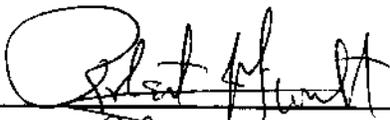
Upper Leon Soil and Water Conservation District
Local Organization

BY James W. Sweeney
Title Chairman
4/21/1994
Date

The signing of this agreement was authorized by a resolution of the governing body of the Upper Leon Soil and Water Conservation District adopted at a meeting held on 4/21/94.

James W. Sweeney
(Secretary, Local Organization)

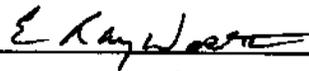
City of Clyde, Texas
Local Organization

By 
Title Mayor
3-8-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the City of Clyde, Texas adopted at a meeting held on 3-8-94.


(Secretary, Local Organization)

Brown County Commissioners Court
Local Organization

By 
Title BROWN COUNTY JUDGE
APRIL 11, 1994
Date

The signing of this agreement was authorized by a resolution of the governing body of the Brown County Commissioners Court adopted at a meeting held on APRIL 11, 1994.


Secretary, Local Organization)

Callahan County Commissioners Court
Local Organization

By *Bill Brown*
Title *County Judge*
3/14/94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Callahan County Commissioners Court adopted at a meeting held on 3-14-94.

Darlene Walker
(Secretary, Local Organization)

Coleman County Commissioners Court
Local Organization

By *W.W. Shelton*
Title *County Judge*
5-9-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Coleman County Commissioners Court adopted at a meeting held on 5-9-94.

Ellen She
(Secretary, Local Organization)
County Clerk

Taylor County Commissioners Court
Local Organization

By *[Signature]*
Title COUNTY JUDGE
7-5-94
Date

The signing of this agreement was authorized by a resolution of the governing body of the Taylor County Commissioners Court adopted at a meeting held on 7-5-94.

Janice Lyons
(Secretary, Local Organization)

Soil Conservation Service
United States Department of Agriculture

Approved By *[Signature]* ACTING
Harry W. Oneth
State Conservationist

Date AUG 9 1994

SUPPLEMENTAL WATERSHED PLAN NO. III

UPPER PECAN BAYOU WATERSHED, TEXAS

Need For Supplement

Since the original Watershed Agreement became effective on the 5th day of February 1966, it has become necessary to modify that agreement in order to facilitate the completion of the project. The sponsors requested the following changes in the original plan:

- (1) Floodwater retarding structure Nos. 8, 13, 14, 17, and 18 will be deleted from the planned works of improvements.
- (2) Floodwater Retarding Structure Nos. 15 and 16 will be modified to present design criteria and will be renumbered 15 Rev. and 16 Rev.
- (3) The Callahan Divide SWCD will be officially added as a local sponsor as they have assumed all obligations previously held by the Central Colorado SWCD and Lower Clear Fork of the Brazos SWCD on lands located in Callahan County due to the sponsors' reorganization.
- (4) Add required certifications on drug-free workplace, lobbying, and other matters.

Effects Of The Proposed Changes

The flood protection provided by the planned works of improvement to be deleted at the request of the sponsors will be foregone. Twenty four of the originally planned 34 floodwater retarding structures and the multiple-purpose structure have been installed and are providing flood protection to floodplain lands below the structures. Floodwater Retarding Structures Nos. 8, 13, 14, 17, and 18 which are deleted by this Plan Supplement, will result in a decrease of floodwater damage reduction from 66 percent to 43 percent.

A biological evaluation was made on the proposed changes to the watershed and it indicated that no federally listed threatened or endangered plants or animals would be affected and that no critical habitat was present. It was found that no long-term adverse impacts will be caused by this plan modification. It was also determined that the areas where construction will occur will affect the same amount of Riverine-Intermittent wetlands as was at the original sites.

SCS activities for protection and preserving cultural resources will include a cultural resource specialist conducting a complete detailed survey prior to construction to determine if any cultural resources exist within the proposed work areas. If any significant cultural resources are found during the survey, SCS will take appropriate actions to protect them. The proposed work areas will also be monitored during construction and if any cultural resources are discovered, SCS will notify the State Historic Preservation Officer and will take appropriate actions to protect any significant cultural resources and avoid any adverse effect on them.

Revised Table 1, Estimated Installation Cost
 Upper Pecan Bayou Watershed, Texas
 (Middle Colorado River)
 (Dollars) 1/

| Installation cost item | Unit | Number | | Estimated Cost (Dollars) 2/ | | | | | | Total | | |
|------------------------------------|------|--------------|------------------|-----------------------------|------------------|--------------|------------------|-------|--|-------|-----------|------------|
| | | Federal land | Non-federal land | Public Law 78-534 funds | | Other funds | | Total | | | | |
| | | | | Federal land | Non-Federal land | Federal land | Non-Federal land | | | | | |
| Land treatment | | | | | | | | | | | | |
| Cropland | Acre | | 39,279 | | | | | | | | 915,192 | 915,192 |
| Grassland | Acre | | 81,119 | | | 90,000 | | | | | 837,108 | 837,108 |
| Technical Assistance Accelerated | | | | | | 90,000 | | | | | 90,000 | 90,000 |
| Subtotal | | | 120,398 | | | 90,000 | | | | | 1,752,300 | 1,842,300 |
| Structural measures | | | | | | | | | | | | |
| Floodwater Retarding Structures | No. | | 26 | | | | | | | | | |
| Multiple-Purpose Structure | No. | | 1 | | | 10,592,600 | | | | | | 10,592,600 |
| Municipal Outlet Structure | No. | | 1 | | | 638,650 | | | | | | 973,525 |
| Basic Recreational Facilities | No. | | 1 | | | 83,025 | | | | | | 69,150 |
| Subtotal | | | | | | 11,314,275 | | | | | | 166,050 |
| Installation services | | | | | | | | | | | | |
| SCS engineering services | | | | | | | | | | | | |
| Other | | | | | | 1,603,225 | | | | | | 48,050 |
| Subtotal | | | | | | 2,514,750 | | | | | | 20,000 |
| Other costs | | | | | | | | | | | | |
| Land, easements, and rights of way | | | | | | | | | | | | |
| Subtotal | | | | | | | | | | | | 68,050 |
| Total Structural measures | | | | | | 13,897,275 | | | | | 1,080,300 | 1,080,300 |
| Work Plan preparation | | | | | | | | | | | | |
| Subtotal | | | | | | 97,095 | | | | | | 97,095 |
| Total Project | | | | | | 14,084,370 | | | | | | 2,832,600 |

1/ Price Base: 1993

February 1994

Revised Table 2, Estimated Cost Distribution - Structural and nonstructural measures
Upper Pecan Bayou Watershed, Texas
(Middle Colorado River)
(Dollars) 1/

| Structure Site No. or Name | Installation cost - P.L. 534 | | | | Installation cost - Other funds | | | | Total Installation Cost | | |
|---|------------------------------|-------------|----------------|-------------------|---------------------------------|--------------|-------------|----------------|-------------------------------|--------|-------------------|
| | Construction | Engineering | Land Rights | Project Admin. | Total P.L. 534 | Construction | Engineering | Land Rights | | Other | Project Admin. |
| Constructed Sites | | | | | | | | | | | |
| 1 | 399,150 | 59,875 | | 31,925 | 490,950 | | | 14,700 | | | 14,700 |
| 2 | 715,475 | 78,700 | | 57,250 | 851,425 | | | 30,800 | | | 30,800 |
| 3 | 226,025 | 40,700 | | 18,100 | 284,825 | | | 6,000 | | | 6,000 |
| 4A | 261,875 | 47,100 | | 20,925 | 329,700 | | | 4,700 | | | 4,700 |
| 5 | 221,950 | 39,950 | | 17,750 | 279,650 | | | 5,100 | | | 5,100 |
| 6 | 1,009,900 | 111,100 | | 80,800 | 1,201,800 | | | 19,200 | | | 19,200 |
| 9 | 500,775 | 75,125 | | 40,050 | 615,950 | | | 9,800 | | | 9,800 |
| 10 | 273,475 | 41,025 | | 21,875 | 336,375 | | | 11,800 | | | 11,800 |
| 11A | 828,700 | 107,475 | | 66,125 | 1,002,300 | | | 17,500 | | | 17,500 |
| 12 | 711,750 | 78,300 | | 56,950 | 847,000 | | | 21,100 | | | 21,100 |
| 18A | 381,000 | 57,150 | | 30,475 | 468,625 | | | 50,600 | | | 50,600 |
| 18 | 147,900 | 26,625 | | 11,825 | 186,350 | | | 12,400 | | | 12,400 |
| 20 | 177,450 | 31,950 | | 14,200 | 223,600 | | | 4,400 | | | 4,400 |
| 21 | 267,225 | 48,100 | | 21,375 | 336,700 | | | 6,600 | | | 6,600 |
| 22 | 265,250 | 38,825 | | 21,250 | 325,325 | | | 17,600 | | | 17,600 |
| 23 | 182,900 | 32,925 | | 14,625 | 230,450 | | | 5,500 | | | 5,500 |
| 24 | 503,850 | 42,900 | | 40,300 | 609,650 | | | 33,000 | | | 33,000 |
| 25 | 285,950 | 26,625 | | 22,875 | 335,450 | | | 9,800 | | | 9,800 |
| 26 | 233,875 | 35,075 | | 19,700 | 287,650 | | | 4,400 | | | 4,400 |
| 30 | 383,350 | 57,500 | | 30,875 | 471,725 | | | 15,400 | | | 15,400 |
| 31 | 184,425 | 29,600 | | 13,150 | 227,175 | | | 5,200 | | | 5,200 |
| 32 | 223,800 | 33,575 | | 17,900 | 275,275 | | | 8,300 | | | 8,300 |
| 33 | 173,225 | 31,175 | | 13,650 | 218,050 | | | 8,400 | | | 8,400 |
| 34 | 234,125 | 42,150 | | 18,725 | 295,000 | | | 4,400 | | | 4,400 |
| Subtotal Constructed FRS | 9,771,200 | 1,253,400 | 0 | 701,675 | 10,726,275 | 0 | 0 | 323,700 | 0 | 0 | 323,700 |
| Multi-Purpose Structure Site 7 | | | | | | | | | | | |
| Outlet Municipal Water Recreational facilities | 637,657 | 119,543 | 13,805 | 57,475 | 828,480 | 335,868 | 35,707 | 108,245 | | 9,000 | 486,820 |
| | | | | | | 68,150 | | | 5,000 | | 74,150 |
| | | | | | | 83,025 | | 17,000 | | | 117,585 |
| Subtotal Constructed Multi Purpose Structure | 720,682 | 132,043 | 30,805 | 64,125 | 947,655 | 488,043 | 48,207 | 123,245 | 10,000 | 9,000 | 678,495 |
| Total Constructed FRS & MP | 9,491,882 | 1,385,443 | 30,805 | 765,800 | 11,673,930 | 488,043 | 48,207 | 446,945 | 10,000 | 9,000 | 1,002,195 |
| Remaining Sites to be Constructed | | | | | | | | | | | |
| 15 Revised | 431,500 | 84,725 | | 34,525 | 530,750 | | | 26,800 | | 500 | 27,300 |
| 16 Revised | 1,388,900 | 182,900 | | 111,200 | 1,683,000 | | | 88,900 | | 500 | 89,400 |
| Total Remaining Sites | 1,821,400 | 217,625 | 0 | 145,725 | 2,184,750 | 0 | 0 | 115,700 | 0 | 1,000 | 116,700 |
| Grand Total | 11,313,282 | 1,603,068 | 30,805 | 911,525 | 13,859,680 | 488,043 | 48,207 | 562,645 | 10,000 | 10,000 | 1,119,695 |

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1/ Price Base: 1993
2/ Actual landrights cost.

Table 2a - Cost Allocation and Cost-sharing Summary - Structural and nonstructural measures
 Upper Pecan Bayou Watershed, Texas
 Middle Colorado River
 Dollars

| | Cost Allocation | | | | | Cost Sharing | | | | | Total | | | |
|---|-------------------|----------------|--------------------|-------------------|-------------------|-------------------|---------------|--------------------|-------------------|------------------|----------------|----------------|--------------------|------------------|
| | Purpose | | | | | PL-534 | | | | | | | | |
| | Flood Prevention | Recreation | M & I water supply | Total | | Flood Prevention | Recreation | M & I water supply | Total | Flood Prevention | | Recreation | M & I water supply | |
| FLOODWATER RETARDING STRUCTURES | | | | | | | | | | | | | | |
| Construction | 10,592,600 | | | 10,592,600 | | 10,592,600 | | | 10,592,600 | | | | | 0 |
| Engineering | 1,471,025 | | | 1,471,025 | | 1,471,025 | | | 1,471,025 | | | | | 0 |
| Landrights | 440,400 | | | 440,400 | | 847,400 | | | 847,400 | 440,400 | | | | 440,400 |
| Project Administration | 847,400 | | | 847,400 | | | | | | | | | | 0 |
| Subtotal | 13,351,425 | 0 | 0 | 13,351,425 | 12,911,025 | 12,911,025 | 0 | 0 | 12,911,025 | 440,400 | 0 | 0 | 0 | 440,400 |
| MULTIPLE PURPOSE STRUCTURE NO. 7 | | | | | | | | | | | | | | |
| Construction | 525,701 | 223,912 | 293,062 | 1,042,675 | 525,701 | 111,956 | | | 637,657 | | | | 293,062 | 405,018 |
| Engineering | 83,836 | 35,707 | 35,707 | 155,250 | 83,836 | 35,707 | | | 119,543 | | | | 35,707 | 35,707 |
| Landrights | 64,830 | 27,610 | 27,610 | 120,050 | 31,035 | 13,805 | | | 13,805 | 64,830 | | | 27,610 | 106,245 |
| Project Administration | 35,885 | 15,290 | 15,290 | 66,475 | | 13,220 | | | 57,475 | 4,860 | | | 2,070 | 9,000 |
| Other | | | 5,000 | 5,000 | | | | | | | | | 5,000 | 5,000 |
| Subtotal | 710,262 | 302,519 | 376,669 | 1,389,450 | 640,572 | 174,688 | 13,220 | 13,220 | 828,480 | 69,690 | 127,831 | 363,449 | 5,000 | 560,970 |
| RECREATION FACILITIES | | | | | | | | | | | | | | |
| Construction | | 166,050 | | 166,050 | | 83,025 | | | 83,025 | | | | | 83,025 |
| Engineering | | 25,000 | | 25,000 | | 12,500 | | | 12,500 | | | | | 12,500 |
| Landrights | | 34,000 | | 34,000 | | 17,000 | | | 17,000 | | | | | 17,000 |
| Project Administration | | 6,650 | | 6,650 | | 6,650 | | | 6,650 | | | | | 6,650 |
| Other | | 5,000 | | 5,000 | | | | | | | | | | 5,000 |
| Subtotal | 0 | 236,700 | 0 | 236,700 | 0 | 119,175 | 0 | 0 | 119,175 | 0 | 117,525 | 0 | 0 | 117,525 |
| TOTAL | 14,061,687 | 539,219 | 376,669 | 14,977,575 | 13,551,597 | 293,863 | 13,220 | 13,220 | 13,858,680 | 510,090 | 245,356 | 363,449 | 0 | 1,118,895 |

1/ Price Base 1993.

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TABLE 3: STRUCTURAL DATA - DAMS WITH PLANNED STORAGE CAPACITY
 UPPER PECAN BAYOU WATERSHED, TEXAS
 MIDDLE COLORADO RIVER

| ITEM | UNIT | STRUCTURE NUMBERS | |
|---|----------|-------------------|------------|
| | | 15 REVISED | 16 REVISED |
| Class of Structures | | A | A |
| Seismic Zone | | 0 | 0 |
| Uncontrolled Drainage Area | SQ. MI. | 3.78 | 21.02 |
| Runoff Curve No. (1 Day) (Average AMC II) | | 64 | 67 |
| Time of Concentration (Tc) | HR. | 1.94 | 4.05 |
| Elevation Top of Dam | FT. | 1745.8 | 1712.2 |
| Elevation Crest Emergency Spillway | FT. | 1740.0 | 1704.0 |
| Elevation Crest High Stage Inlet | FT. | 1713.0 | 1670.0 |
| Elevation Crest Lowest Ungated Outlet | FT. | 1713.0 | 1666.2 |
| Emergency Spillway Type | | ROCK | ROCK |
| Emergency Spillway Bottom Width | FT. | 100 | 200 |
| Emergency Spillway Exit Slope | % | 9.4 | 13.0 |
| Maximum Height of Dam | FT. | 54 | 65 |
| Volume of Fill | CU. YD. | 118,000 | 407,000 |
| Total Capacity 1/ | AC. FT. | 659 | 4149 |
| Sediment Submerged Lowest Ungated Outlet 2/ | AC. FT. | 76 | 160 |
| Sediment Submerged 100 Years | AC. FT. | 76 | 270 |
| Sediment Aerated | AC. FT. | 16 | 34 |
| Floodwater Retarding | AC. FT. | 567 | 3845 |
| Surface Area | | | |
| Lowest Ungated Outlet | AC. | 9.4 | 23.0 |
| Sediment Pool | AC. | 9.4 | 37.0 |
| Floodwater Retarding Pool | AC. | 35.9 | 198.0 |
| Principal Spillway Design | | | |
| Rainfall Volume (1 Day) | IN. | 7.40 | 7.50 |
| Rainfall Volume (10 Day) | IN. | 11.80 | 12.20 |
| Runoff Volume (10 Day) | IN. | 4.06 | 4.99 |
| Capacity of High Stage (Maximum) | CFS | 67 | 271 |
| Dimensions of Conduit | IN. | 24 | 42 |
| Frequency Operation (Emergency Spillway) | % CHANCE | 2.6 | 1.9 |
| Emergency Spillway Hydrograph | | | |
| Rainfall Volume | IN. | 7.63 | 7.21 |
| Runoff Volume | IN. | 3.49 | 3.48 |
| Storm Duration | HR. | 6 | 6 |
| Velocity of Flow (V _e) | FT./SEC. | 6.54 | 0 |
| Maximum Reservoir Water Surface Elevation | FT. | 1741.3 | 1703.1 |
| Freeboard Hydrograph | | | |
| Rainfall Volume | IN. | 12.07 | 11.40 |
| Runoff Volume | IN. | 7.23 | 7.07 |
| Storm Duration | HR. | 6 | 6 |
| Maximum Reservoir Water Surface Elevation | FT. | 1745.1 | 1711.2 |
| Discharge Per Foot of Width (O _e /b) | AC. FT. | 7.9 | 18.0 |
| Bulk Length | FT. | 280 | 270 |
| Capacity Equivalents | | | |
| Sediment Volume | IN. | 0.46 | 0.27 |
| Floodwater Retarding Volume | IN. | 2.82 | 3.43 |

24.8
15.8

1/ At Emergency Spillway Crest
 2/ Included in Sediment Submerged 100 Years

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REVISED TABLE 4 - ANNUALIZED ADVERSE NED EFFECTS
 UPPER PECAN BAYOU WATERSHED, TEXAS
 (MIDDLE COLORADO RIVER WATERSHED)
 (DOLLARS) 1/

| EVALUATION UNITS | PROJECT OUTLAY | | OTHER DIRECT COST | TOTAL |
|--|--------------------------------------|--|----------------------|---------|
| | AMORTIZATION OF INSTALLATION COST | OPERATION MAINTAINCE AND REPLACEMENT COST | | |
| Floodwater Retarding Structures 1, 2, 3, 4A, 5, 6, 9, 10, 11A, 12, 15 Rev. 16 Rev., 18A, 19, 20, 21, 22, 23, 24, 25 26, 30, 31, 32, 33, 34, and MP Site 7 | 507,400 | 47,500 | 0 | 554,900 |
| GRAND TOTAL | 507,400 | 47,500 | 0 | 554,900 |

1/ Price Base 1993, discounted at 3.25 % for 100 years.

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Revised Table 5. Estimated Average Annual Flood Damage Reduction Benefits
 Upper Pecan Bayou Watershed, Texas
 (Middle Colorado River)
 (DOLLARS) 1/

| Item | Estimated average annual damage | | | | Damage reduction benefit 3/ 4/ | |
|-------------------------|--------------------------------------|--------------------------------------|-----------------------------------|-----------------------------------|--------------------------------|-------------------|
| | Without project Agric.-related /2 | Without project Nonagric.-related | With project Agric.-related /2 | With project Nonagric.-related | Agric.-related /2 | Nonagric.-related |
| Floodwater | | | | | | |
| Crop and Pasture | 484,300 | | 277,300 | | 207,000 | |
| Other Agricultural | 526,500 | | 285,100 | | 241,400 | |
| Non-agricultural | | | | | | |
| Road and Bridge | | 121,700 | | 82,100 | | 39,600 |
| Urban | | | | | | |
| Residential | | | | | | |
| Commercial | | | | | | |
| Subtotal | 1,010,800 | 121,700 | 562,400 | 82,100 | 448,400 | 39,600 |
| Sediment | | | | | | |
| Overbank | 104,000 | | 55,800 | | 48,200 | |
| Channel | | | | | | |
| Swamping | | | | | | |
| Subtotal | 104,000 | 0 | 55,800 | 0 | 48,200 | 0 |
| Erosion | | | | | | |
| Scour | 55,500 | | 31,800 | | | 23,700 |
| Valley Trenching | | | | | | |
| Streambank | | | | | | |
| Subtotal | 55,500 | 0 | 31,800 | 0 | 0 | 23,700 |
| GRAND TOTAL | 1,170,300 | 121,700 | 650,000 | 82,100 | 496,600 | 63,300 |

1/ Price base 1993.

2/ Agriculture-related damages includes damage to rural communities.

3/ Includes effects of required land treatment measures.

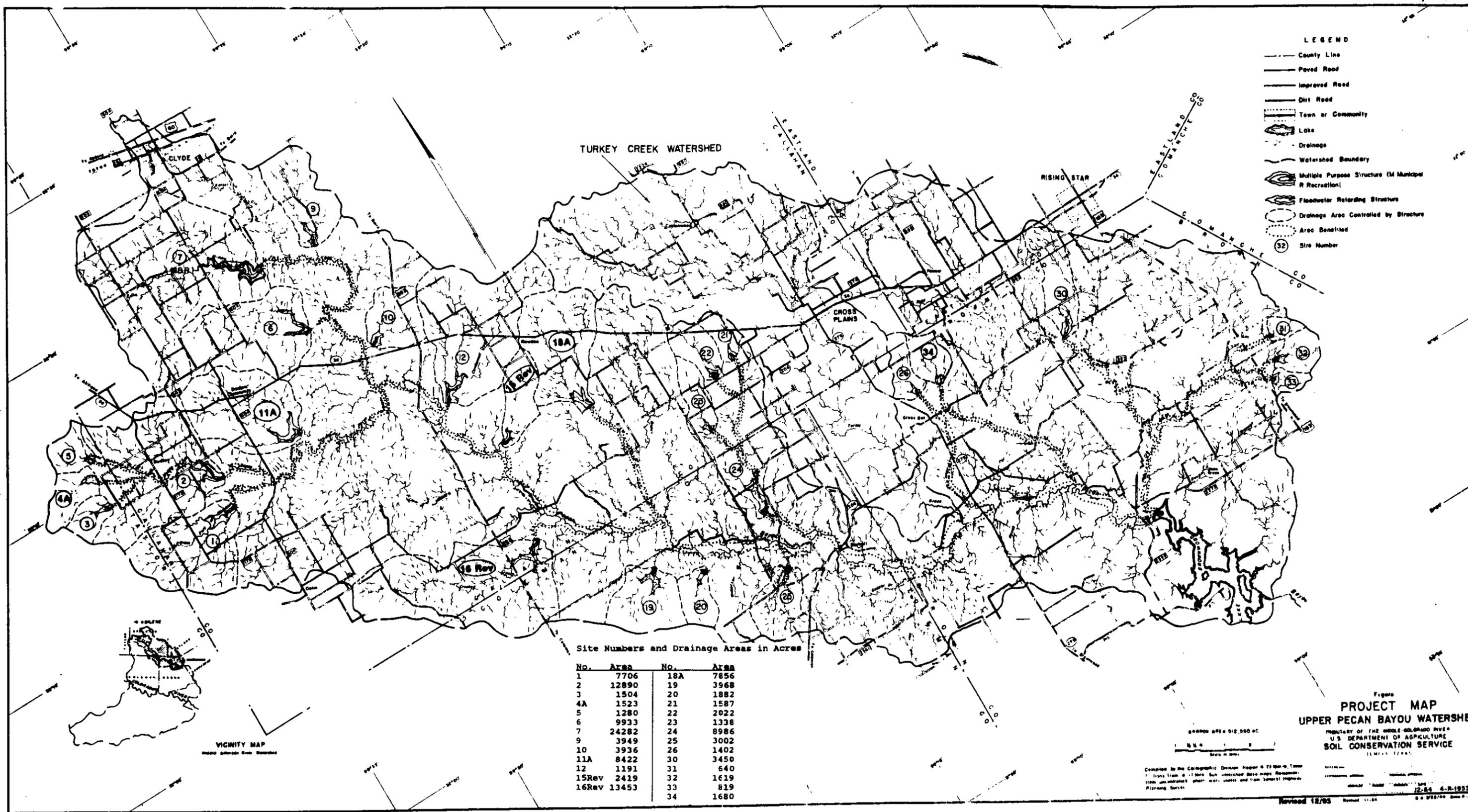
4/ Costs and benefits for associated onfarm land treatment have been netted out.

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TABLE 6 - COMPARISON OF NED BENEFITS AND COSTS ANNUALIZED ADVERSE NED EFFECTS
(DOLLARS) 1/
UPPER PECAN BAYOU WATERSHED

| Evaluation Units | Agriculture-related | | | | Nonagricultural | | | M & I Water Supply | Other Economic Effects | Average annual Benefits | Average annual costs 2/ | Benefit/ Cost Ratio | | |
|--|---------------------|------|-----------------|--------|-----------------|-------|-----|--------------------|------------------------|-------------------------|-------------------------|---------------------|---------|-----------|
| | Damage Reduction | | Intensification | | Res. | Other | | | | | | | | |
| | F.P. | Irr. | Dr. | F.P. | | Irr. | Dr. | | | | | | Comm. | Other |
| Floodwater Retarding Structures 1, 2, 3, 4A, 5, 6, 9, 10, 11A, 12, 15 Rev, 16 Rev., 18A, 19, 20, 21, 22, 23, 24, 25, 26, 30, 31, 32, 33, 34, and MP Site 7 | 615,890 | | | 26,500 | | | | | 41,400 | 176,300 | 57,400 | 917,490 | 554,900 | 1.7 |
| Total | 615,890 | | | 26,500 | | | | | 41,400 | 176,300 | 57,400 | 917,490 | 554,900 | 1.7 : 1.0 |

1/ Price base 1993, discounted at 3.25 % for 100 years.
2/ From Table 4.



- LEGEND**
- County Line
 - Paved Road
 - Improved Road
 - Dirt Road
 - - - Town or Community
 - Lake
 - - - Drainage
 - Watershed Boundary
 - Multiple Purpose Structure (M Municipal R Recreation)
 - Floodwater Retarding Structure
 - Drainage Area Controlled by Structure
 - Area Benefitted
 - Site Number

TURKEY CREEK WATERSHED

Site Numbers and Drainage Areas in Acres

| No. | Area | No. | Area |
|-------|-------|-----|------|
| 1 | 7706 | 18A | 7856 |
| 2 | 12890 | 19 | 3968 |
| 3 | 1504 | 20 | 1882 |
| 4A | 1523 | 21 | 1587 |
| 5 | 1280 | 22 | 2022 |
| 6 | 9933 | 23 | 1338 |
| 7 | 24282 | 24 | 8986 |
| 9 | 3949 | 25 | 3002 |
| 10 | 3936 | 26 | 1402 |
| 11A | 8422 | 30 | 3450 |
| 12 | 1191 | 31 | 640 |
| 15Rev | 2419 | 32 | 1619 |
| 16Rev | 13453 | 33 | 819 |
| | | 34 | 1680 |

VICINITY MAP
 Shows relative river location

gross area 512,560 ac
 Scale = 1 inch = 1 mile

Figure
PROJECT MAP
UPPER PECAN BAYOU WATERSHED
 REGIONAL OFFICE OF THE ARIZONA-SONORA RIVER
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 (REVISED 12/64)

Compiled by the Cartographic Division, Region 4, Tucson, Arizona
 from 1:50,000 scale maps. Resection from uncorrected photomaps, and from several topographic planning surveys.