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PLAN

and

ENVIRONMENTAL

ASSESSMENT

WHITE TANK MOUNTAINS

WATERSHED

Maricopa County, Arizona

Prepared by:

Flood Control District of Maricopa County
Agua Fria - New River Natural Resource Conservation District
Buckeye - Roosevelt Natural Resource Conservation District

Assisted by:

UNITED STATES DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

FEBRUARY 1996

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**Watershed Plan -- Environmental Assessment
For
White Tank Mountains Watershed
Maricopa County, Arizona**

This document describes a plan for flood prevention in the White Tank Mountains Watershed in central Arizona. Taking no project action was one of the alternatives considered during planning. Benefits exceed costs of the recommended plan. Estimated project costs are \$1,361,000. Project effects include a reduction in the threat of loss of life and damage to property. This document fulfills requirements of the National Environmental Policy Act and the Water Resources Council's "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies." It serves as a basis for authorization of funding under Public Law 83-566.

*Prepared under the authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 U.S.C. 1001-1008)
and in accordance with the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 U.S.C. 4321 et seq.)*

Prepared by:

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 W. Durango St.
Phoenix, AZ 85009**

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P.O. Box 9
Palo Verde, AZ 85343**

Assisted by:

**UNITED STATES DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service**

Comments must be received by April 30, 1996
to be considered during preparation of the final plan/environmental assessment.
For additional information or to comment, contact:

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Watershed Agreement

among the

**Flood Control District of Maricopa County
Agua Fria - New River Natural Resource Conservation District
Buckeye - Roosevelt Natural Resource Conservation District
(Referred to herein as sponsors)**

State of Arizona

and the

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

Whereas, application has heretofore been made to the Secretary of Agriculture by the sponsors for assistance in preparing a plan for works of improvement for the White Tank Mountains Watershed, State of Arizona, under the authority of the Watershed Protection and Flood Prevention Act (16 U.S.C. 1001-1008); 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 NRCS; and

Whereas, there has been developed through the cooperative efforts of the sponsors and NRCS a watershed plan/environmental assessment for works of improvement for the White Tank Mountains Watershed, State of Arizona, hereinafter referred to as the plan/EA, which plan/EA is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the sponsors hereby agree on this plan/EA and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this plan/EA and including the following:

1. The sponsors will acquire with other than Public Law 83-566 funds, such real property as will be needed in connection with the works of improvement. It is estimated that no real property acquisition will be needed.

2. The sponsors hereby agree that they will comply with all of the policies and procedures of the Uniform Relocation and Real Property Acquisition Policies Act (42 U.S.C. 4601 et. seq. as implemented by 7 C.F.R. Part 21) when acquiring real property interests for this federally assisted project. If the sponsors are legally unable to comply with the real property acquisition requirements of the Act, they agree that, before any Federal financial assistance is furnished, they will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance. In any event, the sponsors agree that they will reimburse owners for necessary expenses as specified in 7 C.F.R. 21.1006(c) and 21.1007.

The cost of relocation payments in connection with the displacements under the Uniform Act will be shared by the sponsors and NRCS as follows:

	Sponsors (%)	NRCS (%)	Estimated Relocation 1/ Payment Costs (\$)
Relocation Payments	100	0	0

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1/ Investigation of the watershed project area indicates that no displacements will be involved under present conditions. However, in the event that displacement becomes necessary at a later date, the cost of relocation assistance and payments will be cost shared in accordance with the percentages shown.

3. The sponsors 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.

4. The sponsors will obtain all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement.

5. The percentages of construction costs to be paid by the sponsors and by NRCS are as follows:

Works of Improvement	Sponsors (%)	NRCS (%)	Estimated Construction Costs (\$)
Flood Retarding Structure (Rehab.)	0	100	1,089,000

6. The percentages of the engineering services costs to be borne by the sponsors and NRCS are as follows:

Works of Improvement	Sponsors (%)	NRCS (%)	Estimated Engineering Service Costs (\$)
Flood Retarding Structure (Rehab.)	0	100	109,000

7. There are no nonstructural costs associated with this project. The percentages of implementation costs (including as appropriate, construction, engineering, administration and overhead) of nonstructural costs to be paid by the sponsors and NRCS are as follows:

Nonstructural Works of Improvement	Sponsors (%)	NRCS (%)	Estimated Costs (\$)
None	0	100	0

8. The sponsors and NRCS will each bear the costs of project administration that each incurs, estimated to be \$10,000 and \$153,000, respectively.

9. The sponsors will obtain agreements from owners of not less than 50 percent of the land above each multiple-purpose and floodwater-retarding structure. These agreements state that the owners will carry out conservation farm or ranch plans on their land. The sponsors will ensure that 50 percent of the land upstream of any retention reservoir site is adequately protected before construction of the dam.

10. The sponsors will provide assistance to landowners and operators to ensure the installation of the land treatment measures shown in the plan/EA.

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11. The sponsors will encourage land owners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.
12. The sponsors agree to participate in and comply with applicable Federal flood plain management and flood insurance programs before construction starts.
13. The sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with agreements to be entered into before issuing invitations to bid for construction work.
14. The costs shown in this plan/EA are preliminary estimates. Final costs to be borne by the parties hereto, will be the actual costs incurred in the installation of works of improvement.
15. This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the plan/EA is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.
16. A separate agreement will be entered into between NRCS and the sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
17. This plan/EA may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the sponsors have failed to comply with the conditions of this agreement. In this case, NRCS shall promptly notify the sponsors, in writing, of the determination and the reasons for deauthorization of project funding, together with the effective date. Payments made to the sponsors or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and sponsor(s) having specific responsibilities for the measure involved.
18. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this plan/EA, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
19. The program conducted will be in compliance with the nondiscrimination provisions as contained in Titles VI and VII of the Civil Rights Act of 1964, as amended, the Civil Rights Restoration Act of 1987 (Public Law 100-259), and other nondiscrimination statutes, namely, Section 504 of the Rehabilitation Act of 1973, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, and in accordance with regulations of the Secretary of Agriculture (7 CFR 15, Subparts A & B), which provide that no person in the United States shall, on the grounds of race, color, national origin, age, sex, religion, marital status, or handicap be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving Federal financial assistance from the Department of Agriculture or any agency thereof.

20. 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 NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

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

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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: (1) all direct charge employees; (2) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (3) 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 begin to provide or will continue to provide a drug-free workplace by:

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

(2) Establishing an ongoing drug-free awareness program to inform employees about:

(a) The danger of drug abuse in the workplace;

(b) The grantee's policy of maintaining a drug-free workplace;

(c) Any available drug counseling, rehabilitation, and employee assistance programs; and

(d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:

(a) Abide by the terms of the statement; and

(b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4)(b), with respect to any employee who is so convicted:

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

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(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.

21. Certification Regarding Lobbying (7 CFR 3018):

(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.

22. 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 of 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

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(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.

Signatures:

Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, Arizona 85009

By _____

Title _____

Date _____

The signing of the White Tank Mountains Watershed plan/EA was authorized by a resolution of the governing body of the Flood Control District of Maricopa County and adopted at a meeting held _____ (date)

2801 W. Durango St., Phoenix, Arizona 85009

Secretary

Date _____

Agua Fria - New River Natural Resource
Conservation District
3150 N. 35th Ave.
Phoenix, Arizona 85017

By _____

Title _____

Date _____

The signing of the White Tank Mountains Watershed plan/EA was authorized by a resolution of the governing body of the Agua Fria - New River NRCD and adopted at a meeting held _____ (date)

3150 N. 35th Ave., Phoenix, Arizona 85017

Secretary

Date _____

Buckeye - Roosevelt Natural Resource
Conservation District
220 N. Fourth St.
Buckeye, Arizona 85326

By _____

Title _____

Date _____

The signing of the White Tank Mountains Watershed plan/EA was authorized by a resolution of the governing body of the Buckeye - Roosevelt NRCD and adopted at a meeting held _____ (date)

220 N. Fourth St., Buckeye, Arizona 85326

Secretary

Date _____

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United States Department of Agriculture
Natural Resources Conservation Service
3003 N. Central Ave., Suite 800
Phoenix, Arizona 85012

Approved By:

Michael Somerville
State Conservationist

Date: _____

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**WATERSHED PLAN-ENVIRONMENTAL ASSESSMENT
For
WHITE TANK MOUNTAINS WATERSHED, ARIZONA**

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1
2 **WATERSHED PLAN -- ENVIRONMENTAL ASSESSMENT**
3 **For**
4 **WHITE TANK MOUNTAINS WATERSHED, ARIZONA**

5
6 **SUMMARY OF WATERSHED PLAN**

7
8 Project name: WHITE TANK MOUNTAINS County: MARICOPA State: ARIZONA
9

10 Sponsors:

- 11 1. Flood Control District of Maricopa County;
12 2. Agua Fria - New River Natural Resource Conservation District;
13 3. Buckeye - Roosevelt Natural Resource Conservation District.
14

15 Description of recommended plan:

16 Rehabilitation of an existing floodwater retarding structure to meet State of Arizona dam
17 safety requirements.
18

19 Resource information:

- 20 1. Watershed size - approx. 59,000 acres total area;
21 2. Land cover - approx. 32,000 acres agricultural (irrigated cropland and dairies);
22 - approx. 5,000 acres built-up (residential and Perryville Prison);
23 - approx. 22,000 acres rangeland and miscellaneous.
24

25 Land ownership:

- 26 1. Private land - approx. 70 %;
27 2. County and state land - approx. 25 %;
28 3. Federal land - approx. 5%.
29

30 Number of farms:

- 31 1. Approx. 100 farming operations with average size of about 300 acres;
32 2. 28,000 acres prime farmland and 2,000 acres additional land of statewide importance;
33 3. Estimated 10 minority farmers;
34 4. Estimated 10 limited resource farmers.
35

36 Project beneficiary profile:

37 The population of the watershed is estimated at 3,000 inhabitants. Included in this total are
38 approximately 2,400 prisoners incarcerated in Perryville Prison downstream of White Tanks
39 Structure #3. An additional 300 staff personnel are on duty at any one time at the prison. Of
40 the watershed inhabitants (including prisoners), approximately 7 percent are black, 5 percent
41 are American Indian, and 28 percent are of Hispanic origin.
42

43 Per capita income for persons in the watershed (not including prisoners) is estimated at
44 \$11,000, which is 82 percent of the state average. Owner-occupied housing in the watershed
45 has an average value of \$77,900.
46

47 Wetlands:

48 None present.
49

50 Flood plains:

51 Present along Gila River.
52

53 Highly erodible cropland:

54 Estimated 1,000 acres.
55

56 Endangered species:

57 None known to inhabit the project area.
58

1 Cultural resources:

2 No significant cultural resources in project area.

3 Civil rights implications:

4 There are no proposed policy actions connected with this project which will negatively and
5 disproportionately affect minority or limited resource residents.

6 Problem identification:

7 Existing floodwater retarding structure does not meet State of Arizona dam safety
8 requirements. Down-slope lives and property are threatened.

9 Alternative plans considered:

- 10 1. No action;
11 2. Rehabilitation of existing floodwater retarding structure.

12 Project purpose:

- 13 1. Flood prevention.

14 Principal project measures:

- 15 1. Flood retarding structure (rehabilitation).

16 Project costs (estimated):

Item	PL 83-566 Funds (\$1,000)	%	Other Funds (\$1,000)	%	Total (\$1,000)
Flood retarding structure	1,089	100	0	0	1,089
Landrights acquisition	0	0	0	0	0
Engineering/project admin.	262	96	10	4	272
TOTAL	1,361	100	0	0	1,361

17 Price base 1994

18 November 1995

19 Project benefits:

20 Reduced potential flooding impacts on lives and property.

21 Other impacts:

- 22 1. Land use changes - Temporarily convert approx. 20 acres rangeland for use as borrow
23 area.

24 Environmental values changed or lost:

- 25 1. Wildlife habitat - Slight decrease of low-value habitat temporarily lost to borrow area.
26 2. Visual aspect - Slight change due to structural improvements.

27 Compensatory mitigation:

28 None unless unavoidable cultural resources are encountered.

29 Major conclusions:

30 Project benefits outweigh costs. Recommend proceed with project action.

31 Areas of controversy:

32 No significant areas of controversy known.

33 Issues to be resolved:

34 None known.

INTRODUCTION

The watershed plan and environmental assessment have been combined into a single document referred to as the plan/EA. This plan/EA describes project formulation, identifies the expected economic, environmental, and social impacts, and provides the basis for authorizing federal assistance for implementing the planned measures.

This plan/EA discusses hazardous conditions associated with an existing flood retarding structure located in the southern portion of the White Tank Mountains Watershed in Maricopa County, Arizona. The structure is known as White Tanks Structure #3, hereinafter referred to as Structure #3. This plan/EA presents evidence that the hazardous conditions associated with Structure #3 can be resolved in an economically, environmentally and socially acceptable manner.

Structure #3 was built by the U.S. Soil Conservation Service (SCS) in 1954 under a pilot watershed project known as the White Tank Watershed Protection Project. Legislative authorities for the project were Public Law 74-46 and Public Law 83-156. Originally, the project was to consist of four primary detention structures to reduce damages to down-slope farmland caused by flash flooding from the southern White Tank Mountains and Trilby Wash watersheds. Due to the existence of military and national defense installations in the Trilby Wash watershed, however, the U.S. Army Corps of Engineers undertook the Trilby Wash project to protect these federal properties from flooding. The Corps' McMicken Dam on Trilby Wash provided coincidental protection to farmland in that watershed and eliminated the need for structures #1 and #2. SCS completed design and construction of structures #3 and #4, to provide protection to farmland in the southern portion. The current planning effort is being carried out under Public Law 83-566.

Structure #3 is currently classified by the Arizona Department of Water Resources as posing a "significant" safety hazard and, therefore, is a high priority for rehabilitation. The State does not

1 consider Structure #4 as posing a safety hazard, and so no improvements are proposed for it
2 under this project. The planning area, however, includes the entire watershed above and below
3 both structures.

4
5 The plan's purpose is to rehabilitate Structure #3 to meet State of Arizona dam safety
6 requirements. This will result in a reduced threat to life and property that has developed since
7 Structure #3 was originally constructed. There were no other significant watershed problems or
8 opportunities identified during planning.

9
10 Annualized benefits due to implementation of plan measures are estimated to be \$676,500.

11
12 The estimated annual cost of implementation is \$250,500. The average annual net benefits
13 exceed project costs by \$426,000. The overall benefit-cost ratio is 2.7 to 1.0.

14
15 This plan/EA was prepared under the authority of the Watershed Protection and Flood
16 Prevention Act, Public Law 83-566, as amended (16 U.S.C. 1001-1008). The environmental
17 assessment is in accordance with the National Environmental Policy Act of 1969, Public Law 91-
18 190, as amended (42 U.S.C. 4321 et seq.), also referred to as NEPA. Responsibility for
19 compliance with NEPA rests with the U.S. Department of Agriculture (USDA), Natural
20 Resources Conservation Service (NRCS).

21
22 Local sponsoring organizations are the Flood Control District of Maricopa County, the Agua
23 Fria - New River Natural Resource Conservation District, and the Buckeye - Roosevelt Natural
24 Resource Conservation District.

25
26 Federal, state and local agencies, groups, and private citizens were given the opportunity to
27 participate in the planning process, including the review of planning documents.

PROJECT SETTING

GEOGRAPHY AND LAND USE

The White Tank Mountains Watershed is situated in Maricopa County, west of the City of Phoenix. The community of Perryville and a portion of the City of Goodyear are within the boundaries of the watershed (see Appendix D). Topography of the watershed ranges from rugged mountain slopes and foothills upstream of the structures, and a broad, gently sloping alluvial fan and terrace down-slope. Channels are very poorly defined or nonexistent throughout the down-slope area.

The watershed above Structures #3 and #4 covers approximately 22,000 acres of the White Tank Mountains. Down-slope of the structures is an area of about 37,000 acres comprised of irrigated cropland and built-up land.

Livestock grazing was the principal land use in the upper reaches of the watershed when the structures were built. Today, land use is primarily recreational. A portion of White Tank Mountain Regional Park forms the uppermost part of the watershed. This park is used for picnicking, rock climbing, hiking, and other non-water-based outdoor activities. Proving grounds established by the Caterpillar Tractor Co. and Case Co. exist, but are no longer in operation. The remainder of the upper area is not being used at this time.

Land below the structures is primarily used for growing a variety of food and fiber products. This includes cotton, alfalfa, small grains, vegetables, and roses. The built-up area includes a sizable population located in individual dwellings, part of the City of Goodyear, and Perryville Prison. Major facilities include Interstate 10, Southern Pacific Railroad, three major irrigation delivery canals, and other major roads. Most of the urbanization in the down-slope watershed area, including construction of Perryville Prison, has occurred since original construction of the flood retarding structures.

1 Land ownership is primarily private, particularly in the lower watershed. Maricopa County
2 owns and operates the regional park in the upper watershed. The remainder of the land is
3 owned by the State of Arizona and the federal government. Approximately 400 acres of
4 irrigated and miscellaneous land are within the floodplain of the Gila River.

5
6 **CLIMATE**

7 Summers are hot, with afternoon temperatures commonly exceeding 100 ° Fahrenheit, with
8 nighttime lows around 70 °. The area experiences mild winters, with an average daily maximum
9 temperature of 69 ° and an average daily minimum temperature of 36 °. The frost-free growing
10 season usually occurs from mid-March to mid-November.

11
12 Mean annual precipitation in the watershed is slightly over seven inches. Summer precipitation
13 mostly occurs as brief, intense thunderstorms during July and August. Winter precipitation
14 occurs as occasional Pacific storms.

15
16 **REGIONAL SOCIOECONOMIC CONSIDERATIONS**

17 Most of the project area is comprised of small to large farms, with interspersed housing
18 developments. There exists some light manufacturing, and goods and services industries,
19 primarily along the Interstate 10 corridor. The largest incorporated communities in the
20 immediate vicinity of the watershed area are Goodyear (estimated 1993 population of 7,100);
21 and Buckeye (estimated 1993 population of 5,000). An estimated 300 people reside in
22 approximately 70 homes below Structure #3. An additional 2,700 inmates and staff occupy
23 Perryville Prison.

24
25 According to the 1990 Census of Population, per capita income is \$11,000 in the City of
26 Goodyear. Per capita income for all persons in Maricopa County is \$15,000, while per capita
27 income in the State is \$13,500. Owner-occupied housing in Maricopa County has a median
28 value of \$73,800 versus the State average of \$80,100.

1 Of the approximately 100 watershed farm operations, it is estimated that ten are owned/operated
2 by minority and/or limited resource farmers, constituting about ten percent of the total farming
3 operations. NRCS does not proposed any project actions which would negatively and
4 disproportionately affect minority or limited resource farmers.

5
6 **IMPORTANT FARMLANDS**

7 Most of the irrigated cropland of the watershed area is very productive. Approximately 28,000
8 acres of cropland contain deep, well-drained soils. When irrigated, these cropland acres meet
9 the USDA criteria for prime farmland. The remaining 2,000 acres of cropland consist of deep,
10 well-drained, but somewhat droughty soils. When irrigated, these cropland acres meet the
11 criteria for additional farmland of statewide importance.

12
13 **THREATENED AND ENDANGERED SPECIES AND OTHER BIOLOGICAL**
14 **RESOURCES**

15 Federal and State-agency publications and other sources do not indicate the presence of
16 threatened or endangered (T&E) plant or animal species in the watershed. Some riparian areas
17 are present along the Gila River; however, there are no naturally-occurring wetlands in the
18 watershed area.

19
20 **CULTURAL RESOURCES**

21 A cultural resources investigation of a portion of the upper watershed was conducted by a
22 qualified archeological firm. No significant cultural resources were found. Archeological
23 clearance was recommended for the project. Cultural resources consultations were undertaken
24 with the State Historic Preservation Office.

WATERSHED PROBLEMS AND OPPORTUNITIES

1
2
3 The major problem in the watershed area is the current condition of Structure #3, which does
4 not meet State of Arizona dam safety requirements. This has resulted in a greater potential for
5 flooding of down-slope areas and consequent loss of lives and damage to property. There were
6 no other significant watershed problems or opportunities identified during planning.

7
8 Structure #3 is located on the eastern slope of the White Tank Mountains. The surficial geology
9 of the area consists of alluvial fan sediments overlying bedrock. Thickness of the sediments
10 increases with distance from the mountains. A 1990 survey of Structure #3 revealed that the
11 dam crest and adjacent land at the northern end of the structure had subsided nearly 4.5 feet
12 since 1954. The survey showed that subsidence at and near the southern end of the dam was
13 negligible. The subsidence in this area has been attributed to the consolidation of sediment in
14 the subsurface as a result of a declining groundwater table. Bedrock is present at a shallow
15 depth beneath the southern end of Structure #3, thus limiting the potential for subsidence there.

16
17 As a result of the subsidence, overtopping of the dam is expected to occur at much less than the
18 design storm event and result in a breach of the dam. Continued subsidence during the next ten
19 to twenty years will place the structure in increased danger of failure due to overtopping.

20 Presently, due to the subsidence and an inadequate emergency spillway, the structure is only
21 capable of safely passing 60% of the required probable maximum flood (PMF) without
22 overtopping. The State requires that medium size, high hazard structures, such as Structure #3,
23 safely pass the full PMF without overtopping. The work required to meet State requirements is
24 in excess of the normal operation and maintenance of the structure.

25
26 Failure of Structure #3 would cause severe damage to down-slope property and probable loss of
27 life. The Flood Control District of Maricopa County completed a "Dam Break Analysis" in
28 1991, which outlined the estimated area that would be impacted following a breach of the
29 structure. Approximately 3,000 people live in the affected area, including residents of the City

1 of Goodyear and inmates and staff located at Perryville Prison. Almost half of the inmates are
2 quartered in cellblocks four feet below ground elevation. Following a breach of Structure #3,
3 flood waters in the locked cells would reach eight to nine feet in depth in less than two hours.
4 Other residents of the area would also be in extreme danger due to the projected depth and
5 velocity of water. Flood depths would range from 2.0 to 11.6 feet and velocities range from 5.0
6 to 8.4 feet per second. A major transportation artery, Interstate 10, would be cut off, along with
7 the Southern Pacific Railroad. Three major irrigation delivery canals would be severed,
8 affecting thousands of acres of productive farmland. Many other facilities would be impacted by
9 such an event.

10
11 **SCOPE OF THE PLAN/EA**

12
13 The scoping process was used to focus planning efforts on watershed problems and
14 opportunities of most importance to all interested parties. Comments and questions were
15 solicited from local citizens, groups, and local, state, and federal agencies. To begin the scoping
16 process, sponsors held a public meeting on March 22, 1994 at the Maricopa Water District
17 office. Due to poor attendance at the meeting, sponsors and NRCS decided a more effective
18 method of public involvement might be a direct mailing to every watershed property owner. In
19 early May, 1994, such a mailing was made, which included a public notice and scoping response
20 sheet. A total of 58 response sheets was received back from the public. Sponsors and NRCS
21 reviewed the responses. It was determined that some responses related directly to localized
22 flooding problems, which the FCDMC agreed to handle. The remaining responses dealt
23 primarily with watershed issues. These comments were considered during planning. A primary
24 concern expressed by many respondents related to the need for adequate flood protection in the
25 area.

26
27 Some concerns that were determined to neither directly affect nor be directly affected by the
28 project included long-term effects on air quality, on fish or other aquatics, or on wetland habitat.

1 All highly erodible lands in the watershed are operated under erosion control plans so that no
 2 Food Security Act restrictions apply.

3
 4 Opportunity for public input has been available throughout the planning process through public
 5 meetings regularly held by the sponsors. Written comments will be solicited during review
 6 periods.

7
 8 Scoping of concerns caused planning efforts to be directed toward addressing the hazardous
 9 conditions associated with Structure #3. Table A displays a synopsis of the results of the
 10 scoping process.

11
 12
 13
 14 TABLE A -- Evaluation of Identified Economic, Social,
 15 Cultural, and Environmental Concerns
 16 White Tank Mountains Watershed, Arizona

19 Environmental, Social, 20 Economic, and 21 Cultural Concerns	Degree of Local Concern	Degree of Significance to Decisionmaking ^{1/}	Remarks
24 Protection of lives & property	High	High	Maintain/improve flood protection to lives/property
26 Water supply/table	High	High	Maintain adequate supplies & groundwater table
28 Natural desert habitat	High	High	Minimize changes or impacts
29 Important farmland	High	High	Protect from flood damage
30 T&E species	Medium	High	Assess continually
31 Economics	Medium	Low	No additional taxes
32 Cultural resources	Low	High	Assess continually
33 Soil erosion	Low	Low	Minimize

34
 35 ^{1/}
 36 High - Must be considered in the analysis of alternatives
 37 Medium - May be affected by alternative solutions
 38 Low - To be considered, but of low significance

FORMULATION AND COMPARISON OF ALTERNATIVES

FORMULATION GOAL AND PROCESS

Based on the identified problem, the following formulation goal was identified: Rehabilitate Structure #3 to meet State of Arizona dam safety requirements. Realization of this goal would restore the dam's function of providing flood protection to down-slope lives and property.

Alternative plans were formulated to address the identified goal, including a no-action alternative. This section describes the formulation process leading to the selection of an appropriate alternative. No civil rights implications were identified to address.

Consideration was given to taking no project action whatsoever. This "no-action" alternative is labeled "Alternative 1, FUTURE WITHOUT PROJECT," and is described following this section.

To formulate project action alternative(s), analyses were made of the existing Structure #3 and hydrologic/hydraulic conditions in the upstream watershed. Investigations were made to document the historic subsidence of the dam crest and land surface, and to detect trends in the rates of subsidence. Foundation soils were previously sampled, identified, and tested by SCS in 1992. Additional investigations were made on proposed features of the upgraded structure. Analyses were also made of conditions related to the identified environmental, social, economic and cultural concerns.

The only alternative identified as having potential to realize the formulation goal was to design and implement works of improvement to Structure #3. A number of engineering options were considered under this alternative to determine the most effective and cost-efficient method of rehabilitation.

The identified "action" alternative is labeled "Alternative 2, REHABILITATION OF FLOOD RETARDING STRUCTURE," and is described in the next section.

1
2 The alternatives were evaluated for public acceptability, effectiveness in reducing the dam safety
3 problem, efficiency or cost effectiveness, and completeness in accounting for all actions. The
4 alternatives will be discussed at a public meeting and will be made available for comment to
5 groups and local, county, state, and federal agencies, during review of the draft plan/EA.
6

7 **DESCRIPTION OF ALTERNATIVE PLANS**

8 Alternative 1, FUTURE WITHOUT PROJECT

9 This is the no project action alternative. Subsidence is expected to continue and the condition of
10 the dam to further deteriorate. Without rehabilitation, the dam will eventually become in danger
11 of overtopping by a 100-year frequency storm event, thus posing an increasingly serious threat
12 to down-slope lives and property. Also, without rehabilitation, it is expected that the State of
13 Arizona would eventually require a breach of the structure.
14

15 Alternative 2, REHABILITATION OF FLOOD RETARDING STRUCTURE

16 This is the project action alternative. Due to the magnitude of potential losses in lives and
17 property, this alternative includes works of improvement which will enable Structure #3 to meet
18 State of Arizona dam safety requirements. Improvements will include measures needed to meet
19 state requirements and current NRCS standards, including: raising the dam crest to the elevation
20 required to safely pass the full PMF and accommodate future subsidence; and proportioning the
21 dam's spillways to safely pass the PMF.
22

23 Total cost of this alternative is estimated at \$1,361,000; which includes \$1,089,000 for
24 construction and \$272,000 for engineering/project administration. No landrights costs are
25 expected. All construction and engineering costs, and most project administration costs, will be
26 borne by the federal government. Sponsors will incur some project administration expenses.
27 The Flood Control District of Maricopa County will provide funds for landrights acquisition (if
28 needed) and operation and maintenance of the completed structure.
29

1 **EFFECTS OF ALTERNATIVE PLANS**

2 National Economic Development

3 Under Alternative 1, there would be no project costs or benefits.

4
5 Under Alternative 2, the average annual cost for installation, including operation and
6 maintenance, totals approximately \$250,500. Average annual benefits for this alternative total
7 an estimated \$676,500. Net benefits are estimated at \$426,000 with a benefit-cost ratio of
8 2.7:1.0.

9
10 It is estimated that a breach event would cause \$54 million in damages. Therefore, even though
11 there is a low probability that a breach would occur in any specified year, average annual
12 damages remain high.

13
14 Regional Economic Development

15 Under Alternative 1, there would be no project costs or benefits.

16
17 Under Alternative 2, annual regional adverse impacts are estimated at \$10,000, annual regional
18 beneficial impacts are estimated at \$917,700, with a net beneficial impact of \$907,700 per year.

19
20 Environmental Quality (Natural Desert Habitat)

21 Under Alternative 1, environmental conditions in the project will remain relatively unchanged.

22
23 Under Alternative 2, construction of improvements to Structure #3 will temporarily destroy
24 about 20 acres of vegetation and animal habitat in the area. The previously disturbed borrow
25 sites will be used to the extent possible, however additional borrow area will be required.

26 Mitigation for these disturbed sites is not anticipated since no highly sensitive habitat will be
27 affected and other large areas of readily available habitat exist nearby. Air quality will be
28 lowered temporarily during construction.

1 Environmental Quality (Threatened and Endangered Species)

2 Presently, no threatened or endangered plant or animal species are known to inhabit the project
3 area.

4
5 Under both alternatives, protected species conditions are expected to remain unchanged.

6
7 Environmental Quality (Water Supply/Table)

8 Under both alternatives, there will be no significant effect on water supply or the water table.

9
10 Environmental Quality (Important Farmland)

11 Under Alternative 1, a significant flooding hazard will remain to important farmlands down-
12 slope of Structure #3.

13
14 Under Alternative 2, the flooding hazard for important farmlands will be significantly reduced.

15
16 Environmental Quality (Cultural Resources)

17 Presently, no known cultural resources exist in the Area of Potential Effect.

18
19 Under both alternatives, cultural resources conditions are expected to remain unchanged.

20
21 Other Social Effects (Protection of Lives and Property)

22 Under Alternative 1, the hazardous conditions associated with Structure #3 would continue to
23 pose a significant threat to down-slope people and property.

24
25 Under Alternative 2, rehabilitation of Structure #3 would significantly reduce the threat to life
26 for approximately three thousand residents down-slope of the dam. Flood protection would be
27 restored for the Perryville Prison facility, several individual dwellings, and other public and
28 private facilities, including Interstate 10. Development is expected to continue in the down-

1 slope area. Rehabilitation of Structure #3, therefore, will result in an increased level of
 2 protection for additional people and property in the future.

3
 4 Other Social Effects (Civil Rights Implications)

5 Under neither alternative does the Natural Resources Conservation Service propose any actions
 6 which would negatively and disproportionately affect the minority and limited resource
 7 owners/operators in the watershed.

8
 9 Table B shows the two alternatives and the expected effects on selected concerns.

10
 11 TABLE B -- Concerns, Alternatives and Expected Effects
 12 White Tank Mountains Watershed, Arizona
 13

14 CONCERN	15 ALTERNATIVE	16 RESULTS
17 Protection of lives & property	18 No action	High potential for flood damage
	19 Rehabilitate structure	Low potential for flood damage
20 Natural desert habitat	21 No action	No change in quantity/quality of habitat
	22 Rehabilitate structure	Slight decrease in quantity of habitat
23 Water Supply/Table	24 No action	No change in water supply & table
	25 Rehabilitate structure	No change in water supply & table
26 Important Farmland	27 No action	High potential for flood damage
	28 Rehabilitate structure	Low potential for flood damage
29 T&E Species	30 No action	No impacts on species (none present)
	31 Rehabilitate structure	No impacts on species (none present)
32 Cultural Resources	33 No action	No impacts on any cultural resources
	34 Rehabilitate structure	No impacts unless mitigation necessary

35
 36
 37
 38 **RISK AND UNCERTAINTY**

39 The degree of risk and uncertainty was considered throughout the planning process. The
 40 primary uncertainty involves the possible existence of additional unknown flooding or other
 41 natural resource problems in the watershed. The risk associated with this uncertainty is
 42 minimized, however, since the Flood Control District of Maricopa County addresses area

1 flooding problems in its "White Tanks Area Drainage Master Plan." Other uncertainty involves
 2 the possibility of hidden archeological resources, the location of which might only be discovered
 3 during construction. There is a risk that mitigation costs may be incurred.

4
 5 **COMPARISON OF ALTERNATIVE PLANS**

6 The plans displayed in Table C are the most realistic alternatives that could be selected as the
 7 recommended plan. Table C is presented so the effects of Alternative 2 (future with project
 8 condition) may be compared against Alternative 1 (future without project condition).

9
 10 **TABLE C -- Summary and Comparison of Alternative Plans**
 11 **White Tank Mountains Watershed, Arizona**
 12

Effect	Alternative 1 (Future w/o Project)	Alternative 2 (Future w/ Project)
Measure	None	Rehabilitation of Structure
Total Project Cost	\$0	\$1,361,000
PL 83-566 share	\$0	\$1,351,000
Other share	\$0	\$10,000
National Economic Development Account		
Beneficial annual	--	\$676,500
Adverse annual	--	\$250,500
Net beneficial	--	\$426,000
Regional Economic Development Account		
Beneficial annual	--	\$917,000
Adverse annual	--	\$10,000
Net beneficial	--	\$907,000
Environmental Quality Account		
Natural desert habitat	no change	no change
Threatened & endangered species	none	none
Water supply/table	no change	no change
Important farmland	no change	increased protection
Cultural resources	none	none
Other Social Effects Account		
Protection of Lives and Property	no change	increased protection
Civil Rights Implications	no change	no change

42
 43 **RATIONALE FOR PLAN SELECTION**

44 Sponsors chose Alternative 2 as the selected plan. This alternative was chosen because the
 45 combination of economic and social benefits far outweigh the overall costs of project action.

1
2 **CONSULTATION AND PUBLIC PARTICIPATION**

3
4 **AGENCY CONSULTATION**

5 Agency consultation and public participation were integral to all phases of planning and
6 environmental evaluation.

7
8 In March, 1994, a scoping meeting was held at the Maricopa Water District office. Notices
9 were mailed to local, state, and federal agencies.

10
11 In June, 1994, the Sponsors provided Arizona's single point of contact, the Arizona Department
12 of Commerce, with notification of application for federal Public Law 83-566 assistance from
13 USDA, Natural Resources Conservation Service to undertake a flood prevention project in the
14 White Tank Mountains Watershed. No comments were received as a result of this process.
15 Also in June, 1994, the Natural Resources Conservation Service completed and circulated a
16 preauthorization planning report and plan of work for this proposed project.

17
18 Preliminary review copies of the plan/EA were distributed for review to NRCS technical
19 specialists and other agencies and groups having technical interest in this project. Discussions
20 and informal comments were incorporated into the draft plan/EA.

21
22 The following agencies and groups were invited to participate during any or all of the planning
23 process including the scoping meeting, public meetings, and during review of documents:

24
25 The Environmental Protection Agency was invited to participate. Agencies of the Department
26 of Agriculture included the Agricultural Research Service, Agricultural Stabilization and
27 Conservation Service, Cooperative Extension, Farmers Home Administration, and Forest
28 Service. The Department of Defense agency contacted was the U.S. Army Corps of Engineers.
29

1 Agencies of the Department of Interior included the Bureau of Land Management, Bureau of
2 Reclamation, Fish and Wildlife Service, Geological Survey, and the National Park Service's
3 Western Archeological Center.

4
5 Agencies of the State of Arizona invited to participate in planning and/or review of the plan
6 included the Department of Agriculture, Department of Commerce, Department of Corrections,
7 Department of Environmental Quality, Department of Transportation, Department of Water
8 Resources, Game and Fish Department, and State Historic Preservation Office.

9
10 Local units of government invited to participate in planning and/or review of the plan included
11 the City of Goodyear, City of Buckeye, and Flood Control District of Maricopa County.

12
13 **PUBLIC PARTICIPATION**

14 A public scoping meeting was held March 22, 1994. Meeting notices were posted in public
15 locations throughout the watershed prior to the meeting. A public notice and response sheet
16 was mailed in May, 1994, to every resident in the watershed area. Responses received were
17 used in the planning process.

18
19 A number of groups and other interested parties were invited to participate in planning and/or
20 review of the plan.

21
22 **SUMMARY OF COMMENTS AND ACTIONS TAKEN**

23 Comments received during NRCS and interested agency and group review of the preliminary
24 plan/EA were used to prepare the draft plan/EA. Comments received during interagency/public
25 review of the draft plan/EA will be summarized for inclusion in Appendix A and will be used to
26 prepare the final plan/EA.

RECOMMENDED PLAN

PURPOSE AND SUMMARY

Alternative 2 is the recommended plan. Its purpose is to rehabilitate White Tanks Structure #3 to meet State of Arizona dam safety requirements.

MEASURES TO BE INSTALLED

Structural Measures

Works of improvement to Structure #3, including: raising the top of dam to the elevation required to safely pass the full Probable Maximum Flood and accommodate future subsidence; and proportioning the dam's spillways to safely pass the PMF. The existing earthen spillway will be replaced by a baffle-chute type spillway. No other measures are proposed to be installed.

PERMITS AND COMPLIANCE

Installation of the proposed measures will be performed in full compliance with all federal, state, and local laws and policies. All required permits will be obtained prior to construction.

COSTS

Tables one through six show the estimated costs and benefits of structural measures, their annualized values, and the benefit-to-cost ratio of the recommended plan.

INSTALLATION AND FINANCING

Responsibilities

The sponsors (Flood Control District of Maricopa County, Agua Fria - New River and Buckeye - Roosevelt Natural Resource Conservation Districts) have all authorities to implement the plan. Natural Resources Conservation Service will provide engineering, project administration, and financial assistance for the design and construction of proposed structural measures.

1 Contracting

2 NRCS will complete contracting for installation of structural measures. Works of improvement
3 will be installed in accordance with applicable local, state, and federal regulations and NRCS
4 standards and specifications.

5
6 Real Property and Relocations

7 The Flood Control District of Maricopa County will be responsible for acquisition of necessary
8 landrights (if any), permits, licenses, and other rights necessary to perform the proposed work.
9 No relocations will result from this project.

10
11 Other Agencies

12 No other Federal agencies are involved with the implementation of this plan.

13
14 Cultural Resources

15 A cultural resources investigation of the project area indicated that there are no identified
16 cultural resources in the Area of Potential Effect. In the event hidden resources are discovered
17 during construction, work will be halted and the NRCS will follow procedures in the NRCS
18 General Manual Title 420, Part 401 (June 1994), as amended, and as agreed to with the State
19 Historic Preservation Officer.

20
21 Financing

22 NRCS will fund 100 percent of the costs of installing proposed structural measures under
23 authority of the Watershed Protection and Flood Prevention Act, PL 83-566, as amended (16
24 U.S.C. 1001-1008).

25
26 Conditions for Providing Assistance

27 The plan is not a document for obligating PL 83-566 or other funds. Assistance furnished by
28 NRCS in carrying out the plan is contingent upon appropriation of funds for this purpose. The
29 sponsors will ensure full conformance with local, state, and federal laws and regulations.

OPERATION, MAINTENANCE & REPLACEMENT (OM&R)

The Flood Control District of Maricopa County will be responsible for all costs of operation and maintenance of the completed works. Guidelines for OM&R requirements will be as shown in the National Operation and Maintenance Manual 180-V of June 18, 1988, and amendments.

LIST OF PREPARERS

The draft plan/EA was prepared following review and concurrence by NRCS specialists with responsibility for biology, cultural resources, geology, hydrology, engineering, and economics.

Name	Job Title and Tenure	Education	Experience	Other
NRCS Arizona Staff				
M.E. Sullivan	ASTC(WR)-2 Staff Ldr.-3	BS, Civil Engr. MBA, Bus. Adm.	Plng. Engr.-5 Ag. Engr.-2	PE registration
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D.H. DeSimone	Resource Con. -2	BS, Evt. Res. in Agriculture	Soil Con.-11 Range Con.-2	
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S. Smarik	Dist. Cons. -9	BS, Nat. Res. Mgt.	Soil Con.	

TABLES

TABLE 1, Estimated Installation Cost
 White Tank Mountains Watershed, Arizona
 (dollars) 1/

Installation Cost Item	Unit	Non-Federal Land	PL 83-566 Funds	Other Funds	Total
Structural Measures					
Floodwater Retarding Structure	each	1	1,361,000	0	1,361,000
Total Project			1,361,000	0	1,361,000

1/ Price base 1994

November 1995

TABLE 2, Estimated Cost Distribution
 White Tank Mountains Watershed, Arizona
 (dollars) 1/

Installation Cost (PL 83-566)					
Item	Const.	Eng.	Real Property Rights	Project Admin.	Total PL 83-566
Structural Measures					
Floodwater Retarding Struct.	1,089,000	109,000	0	153,000	1,351,000
Grand Total	1,089,000	109,000	0	153,000	1,351,000

1/ Price base 1994

November 1995

Installation Cost (Other Funds)						
Item	Const.	Eng.	Real Property Rights	Project Admin.	Total Other	TOTAL INSTALL. COST
Structural Measures						
Floodwater Retarding Structure	0	0	0	10,000	10,000	1,361,000
Grand Total	0	0	0	10,000	10,000	1,361,000

1/ Price base 1994

November 1995

**TABLE 3, Structural Data--Dams With Planned Storage Capacity
White Tank Mountains Watershed, Arizona**

Item	Unit	Quantity	Item (Continued)	Unit	Quantity
Standards and criteria		402	Principal spillway design		
Structure class		C	Rainfall volume (1-day)	in.	3.85
Seismic zone		2	Rainfall volume (10-day)	in.	6.4
Uncontrolled drainage area	mi ²	20.49	Runoff volume (10-day)	in.	1.48
Controlled drainage area	mi ²	223	Capacity of low stage (max.)	ft ³ /sec	N/A
Total drainage area	mi ²	244	Capacity of high stage (max.)	ft ³ /sec	N/A
Runoff curve No. (1-day ARCII)		81	Dimensions of conduit	in.	N/A
Time of concentration (T _c)	hr.	1.85	Frequency operation- emergency spillway	% chance	<1.0
Elevation top dam	ft	1218.6 ¹	Emergency spillway hydrograph		
Elevation crest emergency spillway	ft	1207.36 ²	Rainfall volume	in.	5.29
Elevation crest high stage inlet	ft	N/A	Runoff volume	in.	3.27
Elevation crest low stage inlet	ft	N/A	Storm duration	hr.	6.0
Emergency spillway type		R/C ³ Baffle Chute	Velocity of flow (V _e)	ft/sec	9.0 ⁴
Emergency spillway bottom width	ft	100.0	Max. reservoir water surface elevation	ft	1214.6 ⁵
Emergency spillway exit slope	%	0.5	Freeboard hydrograph		
Maximum height of dam	ft	44.1	Rainfall volume	in.	12.7
Volume of fill	yd ³	222,482	Runoff volume	in.	10.22
Total capacity ⁶			Storm duration	hr.	6.0
Sediment submerged	acre-ft	400	Disch. per ft of width (O _e /b)	acre-ft	86.1
Sediment aerated	acre-ft	500	Bulk length	ft	
Beneficial use	acre-ft	N/A	Capacity equivalents		
Floodwater retarding Between high and low stage	acre-ft	2000.0	Sediment volume	in.	
Surface area			Floodwater retarding volume	in.	
Sediment pool	acres	94.6	Beneficial volume	in.	
Beneficial use pool	acres	N/A			
Floodwater retarding pool ⁷	acres	280.6			

¹ Based on FCDMC survey map.

² Based on FCDMC survey map.

³ Reinforced concrete

⁴ V_e at the spillway crest.

⁵ Based on FCDMC survey map.

⁶ Crest of emergency spillway.

⁷ Crest of emergency spillway.

TABLE 4, Estimated Average Annual National Economic Development (NED) Costs
 White Tank Mountains Watershed, Arizona
 (dollars) 1/

Item	Project Outlays			Total
	Amortization of Installation Cost	OM&R Costs	Other Direct Costs	
Structural Measures				
Floodwater Retarding Structure	241,200	9,300	0	250,500
Grand Total	241,200	9,300	0	250,500

1/ Price base 1994, amortized over 25 years at a discount rate of 7.75 percent

November 1995

TABLE 5, Estimated Average Annual Flood Damage Reduction Benefits
 White Tank Mountains Watershed, Arizona
 (dollars) 1/

Item	Est. Ave. Annual Damage Without Project		Est. Ave. Annual Damage With Project		Damage Reduction Benefit		Total
	Ag. Related	Non-ag. Rel.	Ag. Related	Non-ag. Rel.	Ag. Related	Non-ag. Rel.	
Floodwater							
Crop & Pasture	9,200	-	-	-	9,200	-	9,200
Other Agric.	76,900	-	-	-	76,900	-	76,900
Residential	-	98,400	-	-	-	98,400	98,400
Commercial	-	492,000	-	-	-	492,000	492,000
Grand Total	86,100	590,400	-	-	86,100	590,400	676,500

1/ Price base 1994, amortized over 25 years at a discount rate of 7.75 percent

November 1995

NOTE: Table does not reflect localized flood damages down-slope of structures, which would occur with or without the project.

TABLE 6, Comparison of National Economic Development (NED) Benefits and Costs
 White Tank Mountains Watershed, Arizona
 (dollars)

Item	Annualized Benefit	Annualized Cost	Benefit:Cost Ratio
Structural Measures	676,500	250,500	2.7: 1.0

Price base 1994, benefits and costs amortized over 25 years at a discount rate of 7.75 percent

November 1995

APPENDICES

Appendix A - Record of Comments (N/A)

Appendix B - Support Maps (N/A)

Appendix C - Investigations and Analyses Report

Appendix D - Project Map

Appendix A

Record of Comment

Appendix B

Support Maps

Appendix C

Investigations and Analyses Report

INVESTIGATIONS AND ANALYSES REPORT

WHITE TANK MOUNTAINS WATERSHED

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PURPOSE

The purpose of this report is to present information (not necessarily in the plan/EA) that supports the formulation, evaluation, and conclusions reached in the watershed plan/EA.

ENVIRONMENTAL QUALITY

Other than the resources mentioned in the Project Formulation section of this report, no specific environmental concerns are expected to be significantly affected by this project. Project effects on other environmental amenities such as air quality, surface water quality, visual quality, etc. will be insignificant. The environmental and environmentally-related concerns that were identified during public meetings or expressed as technical concerns by NRCS or other agencies follow:

Important Farmland

NRCS criteria for important farmland were used to determine that nearly all irrigated lands in the watershed qualify as important farmland.

Natural Desert Habitat

NRCS staff specialists investigated existing habitat and it was concluded that no high value habitat will be disturbed by the project.

Wetlands

NRCS staff specialists investigated the presence of naturally occurring wetlands in the watershed and determined that there are none in the area that will be disturbed by the project.

Threatened and Endangered Species

The 1987 USFWS publication *Endangered and Threatened Species of Arizona and New Mexico*, with 1988 addendum, was consulted for information regarding federally-listed threatened and endangered (T&E) species inhabiting the project area. The document did not list any T&E plant or animal species as inhabiting the immediate project area. There are no known federally-proposed T&E species listed as inhabiting the project area.

The 1988 Arizona Game & Fish Dept. publication *Threatened Native Wildlife in Arizona* was consulted for information regarding state-listed animal species that may occur in the project area. The desert tortoise is listed as a candidate species that may inhabit the general area. If individual tortoises or any other protected species are encountered in the project area, the state environmental specialist will be contacted immediately.

Cultural Resources

During planning, a cultural resources site file search and survey were conducted by Archeological Consulting Services, LTD. of Tempe, Arizona. The area surveyed included the project's Area of Potential Effect, which encompasses the area in which any construction activities would occur. No cultural resources were found to be recorded in the site files and no significant cultural resources were discovered during the survey. The consultant recommended clearance for project work.

NRCS has conducted the following actions:

1. environmental evaluation in Area of Potential Effect in accordance with Arizona NRCS policy and NRCS General Manual 420 parts 401 Policy and 601 Handbook;
2. cultural resources investigation by a qualified cultural resources specialist;
3. NRCS personnel training in cultural resources protection.

Should discoveries be made during construction, NRCS personnel will protect the discovery from additional impacts and immediately notify the NRCS cultural resources specialist and SHPO.

GEOLOGIC, HYDROLOGIC, AND ENGINEERING ANALYSES

NRCS staff specialists completed extensive earth sciences and engineering analyses for the project plan. Copies of procedures used and results are available upon request.

Following is an executive summary of the report entitled "Hydrologic Analysis of the White Tank Mountains on Flood Retarding Structure No. 3."

Subsidence (by as much as 4.4 feet) along the northern portion of White Tank Flood Retarding Structure No. 3 has impaired the dam in functioning as designed. The dam as it currently exists will not safely pass a full probable maximum flood event. If a probable maximum precipitation event were to occur, the dam would pose a significant safety hazard to the structures developed (after the dam was built in 1954) below the dam. The Flood Control District of Maricopa County has contracted a conceptual design report for inlet improvements to Structure No. 3. The White Tank Mountains Watershed above Structure No. 3 was analyzed with consideration of proposed inlet improvements.

Inflow hydrographs to the reservoir have been developed based on the proposed inlet improvements and by using current Natural Resources Conservation Service's design criteria (TR 60) and computer programs (TR 20). Based on the existing spillway design, which has not been affected by the subsidence, outflow design hydrographs were also calculated to show expected performance of the principal and emergency spillways and the freeboard of the dam if raised to the original top of dam of 1216.0.

Results of the hydrologic analysis are summarized in the following table. A more complete description of the methodology, parameters, and models used are included with the main report.

DRAFT

<u>Location</u>		<u>Inflow to White Tanks FRS #3</u>			<u>Outflow from White Tanks FRS #3^{1/}</u>		
STORM	Drainage Area (sq. miles)	Peak Q cfs (csm)	T Peak hr.	Volume Acre Feet	Peak Q cfs (csm)	T Peak hr.	Stage feet
6 hr Local PMP	(16.89)	66122 (3915)	2.75	9202	21985 (1302)	3.91	1213.9
6 hr General PMP	(19.92)	34212 (1717)	2.86	6913	13786 (692)	5.31	1212.9
12 hr General PMP	(19.83)	32435 (1636)	5.47	9142	16394 (827)	7.40	1213.2
18 hr General PMP	(19.75)	26906 (1362)	6.90	10327	20304 (1028)	8.32	1213.7
24 hr General PMP	(20.07)	23800 (1186)	8.84	11229	19612 (977)	10.53	1213.6
48 hr General PMP	(19.92)	31818 (1597)	18.16	13411	19279 (968)	19.37	1213.5
72 hr General PMP	(19.89)	32300 (1624)	27.13	14225	21903 (1101)	27.91	1213.9
Emergency Spillway	(20.49)	21685 (1059)	2.83	3567	2683 (131)	6.57	1211.0
Principal Spillway	(20.49)	3290 (161)	119.9	1614	1.7 (.0)	243	1205.8

1/ Peak outflow discharges and stage is assuming emergency spillway remains 800 feet of earth fill with spillway elevation at 1210.0. After final spillway design, outflow hydrographs will be recompiled and added to report.

SOCIAL CONSIDERATIONS

Civil Rights Impact Analysis

In accordance with NEPA, the Water Resources Council's Principles and Guidelines, and USDA Departmental Regulation 4300-4, dated September 22, 1993, a civil rights impact analysis was completed for this project.

There are estimated to be ten minority and ten limited resource owners/operators in the watershed area. Minority and limited resource owners and operators will not be negatively and disproportionately affected by any proposed project actions. The basis for this is that USDA prohibits discrimination in its programs, and the sponsors agreed to carry out the project in accordance with the nondiscrimination provisions as listed in the Watershed Agreement.

PROJECT FORMULATION

The magnitude of the problems and opportunities in the White Tank Mountains Watershed have been determined from consultations with ADWR and FCDMC dam safety personnel and from scoping activities.

Identified Problems and Conclusions

Based on input from agencies and the public, the only significant problem identified related to the need to rehabilitate Structure #3 to meet dam safety requirements.

Formulation Goal

Based on the identified problem and conclusion, this project was formulated to assist the sponsors realize the following goal: Rehabilitate Structure #3 to meet State of Arizona dam safety requirements, thus restoring adequate flood protection to down-slope lives and property.

ECONOMICS

Project Evaluation

The primary benefit from this project is increased protection of about 3,000 persons living down-slope of Structure #3. Annual monetary benefits for project evaluation equal \$676,500, which exceed the annual project costs of \$250,500. The benefit-cost ratio is 2.7 to 1.0.

Procedures from the Water Resources Council's Principles and Guidelines were followed in evaluating costs and benefits. Costs and benefits were computed using standard economic analysis procedures. The project evaluation period is 25 years and was evaluated using an interest rate of 7.75 percent.

EFFECTS ON NATIONALLY RECOGNIZED RESOURCES

Certain federal policies and laws recognize specific types of resources. These policies and laws impose specific requirements for analysis of the effects of the recommended plan as shown in the following table:

**Effects of the Recommended Plan on Resources of National Recognition
White Tank Mountains Watershed, Arizona**

Resources	Principal Sources of National Recognition	Measure of Effects
Air quality	Clean Air Act	No significant effect
Areas w/in coastal zone	Coastal Zone Mgt. Act	Not applicable
Critical habitat	Endangered Species Act	Not applicable
Cultural resources	Nat'l. Historic Preservation Act	No effect
Farmland protection	Farmland Protection Policy Act	Increased protection
Fish & wildlife habitat	Fish and Wildlife Coord. Act	Minimal effect
Flood plains	Executive Order 11988	Not applicable
Water quality	Clean Water Act	No effect
Wetlands	Executive Order 11990	Not applicable

DRAFT

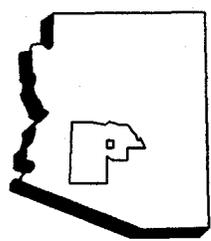
RELATIONSHIP TO LAND AND WATER PLANS, POLICIES, AND CONTROLS

The White Tank Mountains Watershed project was given highest priority ranking by the Arizona Department of Water Resources, the designated State agency for PL 83-566 approval.

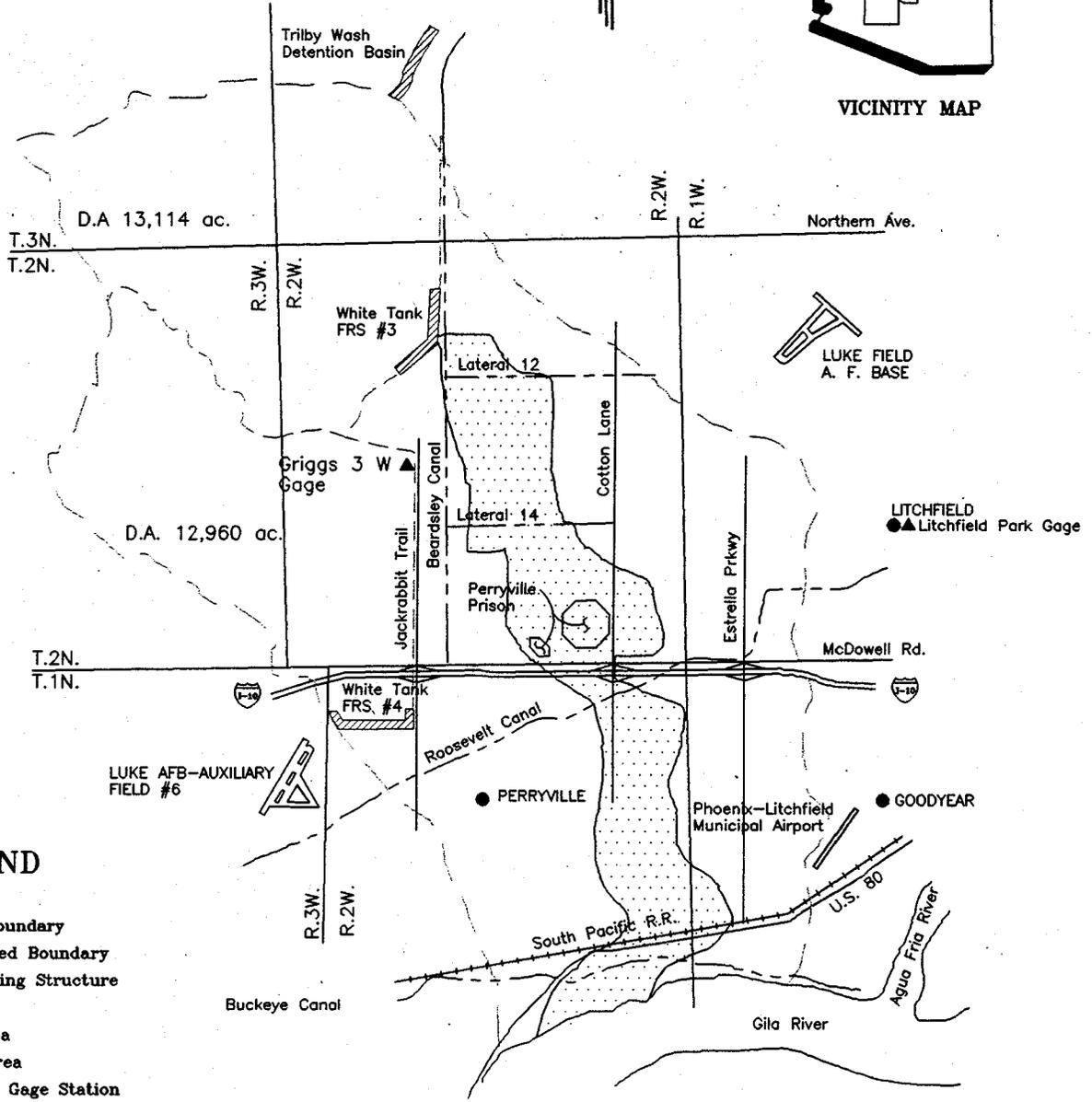
Appendix D

Project Map

WHITE TANK MOUNTAINS



VICINITY MAP

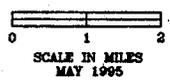


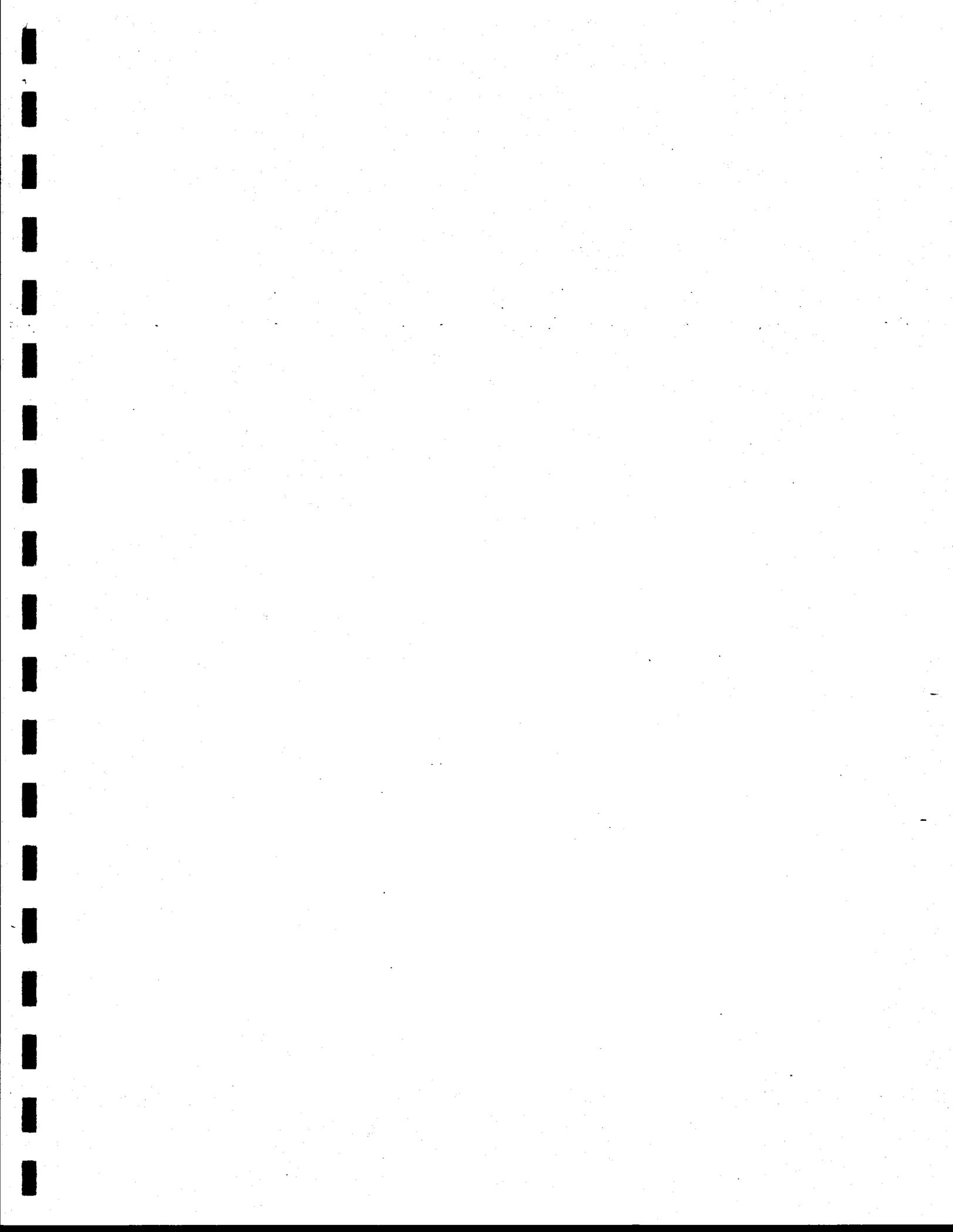
LEGEND

- Watershed Boundary
- - - Sub-watershed Boundary
- ▨ Flood Retarding Structure
- Town
- D.A. Drainage Area
- ▤ Benefitted Area
- ▲ Precipitation Gage Station

FIGURE No. 1

**PROJECT MAP
WHITE TANK MOUNTAINS WATERSHED
MARICOPA COUNTY, ARIZONA**





PROJECT TITLE: White Tanks #3

WATERSHED AND RELATIONSHIP TO OTHER STRUCTURES
Eastern slopes of the White Tanks Mountains

LOCATION: Township, range, section; description from well known physical features; how to get there.

T2N R2W Sections 4, 5, 8 & 9

Take Northern Avenue to just west of the Beardsley Canal and then south using the top of the training dike to the north end of the structure.

AUTHORIZATION: Pilot

FEDERAL SPONSOR: Soil Conservation Service

LOCAL SPONSOR(S): Maricopa County Municipal Water Conservation District No. 1

DOCUMENTATION: e.g., Watershed workplan title/date; supplements EIS date approved

CONTRACTOR: Danens, Shelton & Betts

DATE OF CONSTRUCTION AWARD:

DATE OF FINAL ACCEPTANCE: 1954

FUNCTIONAL DESCRIPTION: Hoe it works.

This structure collects runoff water from the eastern slopes of the White Tanks Mountains, impounds it and releases it through 3 gated outlets or over the emergency spillway at the south end of the structure. A diversion dike west of the Beardsley canal starts at Northern Avenue and runs south to the structure. Water released from this structure will go into the Beardsley Canal or into the desert washes.

PROJECT FEATURES:

Type of structure.....	Compacted Earthfill
Top of structure elevation.....	1216.0
Length of structure.....	7,667 LF
Maximum height.....	30 feet
Top crest width.....	10 feet
Spillway crest elevation.....	1210.0
Spillway capacity.....	11,750 CFS
Drainage area.....	24 square miles
Storage capacity.....	2,655 acre feet
Maximum water surface elevation.....	1213.0
Freeboard	
Peak inflow	
Peak outflow	
Drawdown time.....	80 hours
Principal outlet discharge rate	
Principal outlet structure.....	3 ungated pipes - 2 ea. 48" RCP 1 ea. 24" RCP

LEVEL OF PROTECTION:

Total Costs for White Tanks #3 & #4

Federal: \$199,088
Local: Land, relocations, engineers;
Total \$218,287

ADWR Operational Certificate Issued: date October 16, 1974

ENCLOSURES:

Site Map
Stage Storage Curve
Storage Discharge Summary
Area & Capacity Curve - Attached
Spillway Discharge Curve - Attached
Outlet "M" Discharge Curve - Attached

Dam Safety Status:

MAINTENANCE RESPONSIBILITIES

Structure:
White Tanks #3 6A200

Bank Protection - Riprap		acres
Bridges - Pedestrian		each
Bridges - Vehicle		each
Culverts, Box		each
Culverts, Pipe		each
Drainage Channel - Lined		feet
Drainage Channel - Unlined		miles
Drop Structure		each
Embankment	30	acres
Embankment, Soil Cement		acres
Fencing	15,044	feet
Floodway - Lined		feet
Floodway - Unlined		acres
Gated Outlet	3	each
Gates	6	each
Gutters, Concrete		feet
High Flow	26	acres
Landscape		acres
Low Flow	34	acres
Manholes		each
Meter Houses		each
Outlet Structure		each
Pilot Channel		miles
Pool Area	384	acres
Principal Outlet	195	feet
Ramps, Concrete		feet
Retaining Wall		feet
Right-of-Way		acres
River Clearing		acres
Roads - Asphalt		miles
Roads - Dirt	3.7	miles
Side Inlet		each
Spillway - Earth	12	acres
Spillway - Lined		feet
Stilling Basins		each
Stormdrain Pipe		feet
Trash Racks		each
Vegetative Drains		each