

JOHANNESSEN & GIRAND

Consulting Engineers, Inc.

3500 NORTH CENTRAL AVENUE

PHOENIX, ARIZONA

CR 7-6871

January 18, 1961

Property of
Flood Control District of MC Library
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2801 W. Durango
Phoenix, AZ 85009

Col. Robert E. Cron
Chief Engineer and General Manager
Maricopa County Flood Control District
4701 E. Washington Street
Phoenix, Arizona

Dear Sir:

Transmitted herewith are eight (8) copies of the Preliminary Report covering the flood control study of the Hassayampa River Basin.

Portions of the data contained herein are not complete but are estimates based on the best information available. Statements as to the extent of flood damages have been requested from various utility companies, railroads, State Highway Department, County Highway Department and individual property owners. Responses to these requests have not been very encouraging and some of the statements we have received should be given further analysis. Promises of further information have been given to us and should be fulfilled within the next week.

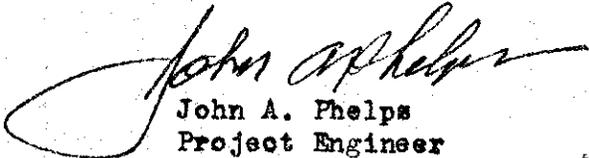
This submittal is for the purpose of discussing the various projects proposed and to determine which projects are to be given further study.

The storm of August, 1951, has been used as the project storm. Rainfall data to determine runoff and net yield were determined from rainfall records of the nearest or most applicable weather station.

This report does not follow the format requested in the directive issued from your office and will be revised in conformity with your instructions in the preparation of the final report.

Respectfully submitted,

JOHANNESSEN & GIRAND


John A. Phelps
Project Engineer

JAP:gs

January 16, 1961

BOX CANYON DAM

Project "A "

The Bureau of Reclamation in 1948 made an extensive study of this dam site for the purpose of irrigation water storage for an agricultural development in the vicinity of Wittman. The project is known as "Hassayampa Project, Arizona" and the report is on file in the Bureau of Reclamation office in Phoenix. The dam site is located on the Hassayampa River approximately 6 miles upstream, north of the Town of Wickenburg and in the Yavapai County. This report is known as "Project Planning Report No. 3-8b. 1-2" and dated February, 1948. The Bureau of Reclamation determined the benefit-cost ratio of this project and on that basis recommended the project not be constructed. The benefit-cost ratio included a modest amount for flood control benefits based on the flood damages as known at that time. The flood damages in the vicinity of Wickenburg, which are caused by the Hassayampa River, appear not of sufficient consequence to influence the benefit-cost ratio to make the project feasible.

Reports from the citizenry of Wickenburg and from the Santa Fe Railroad, State Highway Department and other utilities do not indicate that the waters from the Hassayampa River cause sufficient damages during flood periods to be of major concern at the present time. In the future if sufficient industrial or other development along the Hassayampa River make flood protection desirable or necessary, a flood control dam at Box Canyon could then be constructed. Presently, the Major and perhaps sole benefit derived from a dam and reservoir at Box Canyon would be from recreational benefits and would be offset to a certain degree from the inundation of improved and irrigated lands which are situated within the proposed reservoir area limits. These areas, while not large areas, would be removed from production.

Sufficient data is contained in the previously mentioned report by the Bureau of Reclamation to make a final determination of feasibility and design of a project. This report includes amount of rainfall for the area under consideration, the volumes of runoff, the reservoir storage capacity, the estimated construction cost based on prices prevailing in 1948, and a complete geological study and report of the dam site area.

As stated above, the major flood damages suffered in Wickenburg are not caused by waters from the Hassayampa River but are caused chiefly by flood waters from its tributaries. These tributaries will be further and individually analyzed and discussed later in this report.

The consulting engineers making this flood control study and preparing this report do not recommend further study of the Box Canyon Dam site at this time.

The Box Canyon Dam site is situated in Yavapai County approximately five miles north of the north line of Maricopa County so could not, under the existing law, share in Maricopa County Flood Control funds unless proof of extensive flood damages within Maricopa County is evident.

ESTIMATED COST TO COMPLETE STUDY OF PROJECT

Not recommended for further study

January 16, 1961

MATTHIE DAM AND RESERVOIR

Project "B-1"
and
Project "B-2"

The proposed Matthie Dam site is located on Sols Wash approximately seven miles northwesterly, upstream, from Wickenburg and about one mile west of the Santa Fe Railroad junction known as Matthie, and in the Northeast quarter of Section 36, T. 8 N., R. 6 W., Gila and Salt River Meridian.

The purpose of this dam is threefold:

1. Protect the lower reaches of Sols Wash within the developed area of Wickenburg which are subjected to periodic ravages from flood waters.
2. Create and maintain a reservoir of sufficient area and depth to furnish recreation in the form of fishing, boating, water skiing, swimming and picnicing.
3. Through percolation, furnish a more constant supply of subterranean water supply for domestic and agricultural purposes.

Plate 1 shows this project divided into two parts, Project B-1 and Project B-2. Project B-1 controls waters from Sols Wash. Project B-2 controls waters from an adjacent wash which heads in the mountainous areas in the Black Butte - Vulture Peak area a considerable distance to the south, and flows into Sols Wash in the vicinity of Matthie. The purpose of Project B-2 is to control the waters in this wash and to furnish additional waters to the B-1 project reservoir for recreational purposes.

Access to this area could be made at very reasonable cost from U.S. Highway 60-70 approximately five miles to the south, and from U.S. Highway 89 which is approximately six miles to the east. The area surrounding the proposed site has an abundance of growth including Palo Verde trees and a variety of cactaceous growth including Saguaro, Cholla and Barrel cactus. The area offers many very suitable areas for installation of Ramadas, fire places and other picnic facilities. Many horse trails and hiking paths are now in existence and many others could be established with little or no effort other than through constant use. The area has an abundance of rocks and stones of various sizes, colors, shapes, and geological origin, which is of interest to most people with out of doors habits and likings.

The reservoir would offer numerous sites for the installation of boat landings and other boating and fishing facilities.

A recreational area, such as this project offers, would be of considerable benefit to the State of Arizona, Maricopa County, and, more particularly, the Wickenburg area. Wickenburg, which is considered the "Dude Ranch Capitol of the World" would be provided with an additional recreational facility and one which is unlike any now available to the area and its guests.

CONSTRUCTION FEATURES INVOLVED

The construction of this project would involve:

1. Relocation of approximately 3 miles of the Parker Branch of the Santa Fe Railroad, at an estimated cost of \$100,000 per mile, a total of \$300,000.
2. Construction of Project B-1 dam, height of which would be approximately 60 feet and a length at the crest of 600 feet.
3. Clearing of approximately 600 acres of reservoir area.
4. Construction of controlled outlet at the dam.
5. Construction of spillway.
6. Construction of Project B-2 diversion dam, height 30 feet with a length at the crest of approximately 500 feet.
7. Clearing of diversion basin consisting of approximately 150 acres.
8. Construction of diversion channel into reservoir of Project B-1.
9. Property cost.
10. Maintenance \$5,000 per year.

Dams for both projects would be earthfill construction. Material which appears to possess suitable construction qualities may be obtained from the reservoir area. Suitable rock for facing, rip-rap, or other needs may be quarried from areas containing an abundant supply adjacent to the dam and reservoir site.

PRELIMINARY ESTIMATE OF CONSTRUCTION COST

(Items listed above)

1. \$300,000
2. \$150,000
3. \$ 40,000
4. \$ 10,000
5. \$ 10,000
6. \$ 30,000
7. \$ 15,000
8. \$ 10,000
9. \$ 50,000 (Property Cost)

TOTAL \$615,000

Amortized in 50 years at 5%

 $\$615,000 \times .05478 = \$33,690$ Annual First CostMaintenance = 5,000 per year

\$38,690 Total Annual Cost

Property costs as shown above may not be a factor. It has been stated that the property involved which is not now Public Lands will be donated by the owner.

PRELIMINARY ESTIMATE OF BENEFITS

- | | | |
|---|------------------|-----------------|
| 1. Flood Control.(Plate _____) | \$2,500 annually | \$ 2,500 |
| 2. Recreational benefits, based on value of recreational areas established by Fish and Game Commission. @\$1,000 per acre lake area | | \$ 500,000 |
| 3. Subterranean water supply | | Undetermined |
| 4. Santa Fe Railroad | | \$ <u>1,000</u> |
| Total Benefits | | \$ 503,500 |

Benefit-Cost Ratio: $\$503,500 \div \$38,690 = 13.0$ to 1.0

(Benefit-Cost Ratio based on annual benefit of \$400 per acre of lake area - amortized in 50 years = $\$203,500 \div \$38,690 = 5.27$ to 1.0)

SUGGESTED PARTICIPATION OF COSTS

The Santa Fe Railroad through the past many years have installed many concrete walls and other concrete structures, and have constructed channels and dikes for the purpose of eliminating or decreasing possibilities of damages due to floods. Because of these installations, it appears unlikely that a major cost participation could be expected from the Railroad Company. The relocation of the railroad necessary for this project will improve neither the horizontal nor vertical alignment effecting no monetary savings in operation. Periodic attention to the various flood control structures. At the present time, 10 January 1961, the Railroad Company are cleaning and enlarging channels, improving channel conditions at trestles and other structures, and otherwise preparing for possible floods which could cause damages.

Contributions should be solicited from the operators of the many guest ranches and other tourist establishments whose guests will derive a considerable benefit from the recreational opportunities offered by this project, and,

The Game and Fish Commission.

The State and Federal Parks Departments.

The Soils Conservation Service.

The Maricopa County Flood Control District.

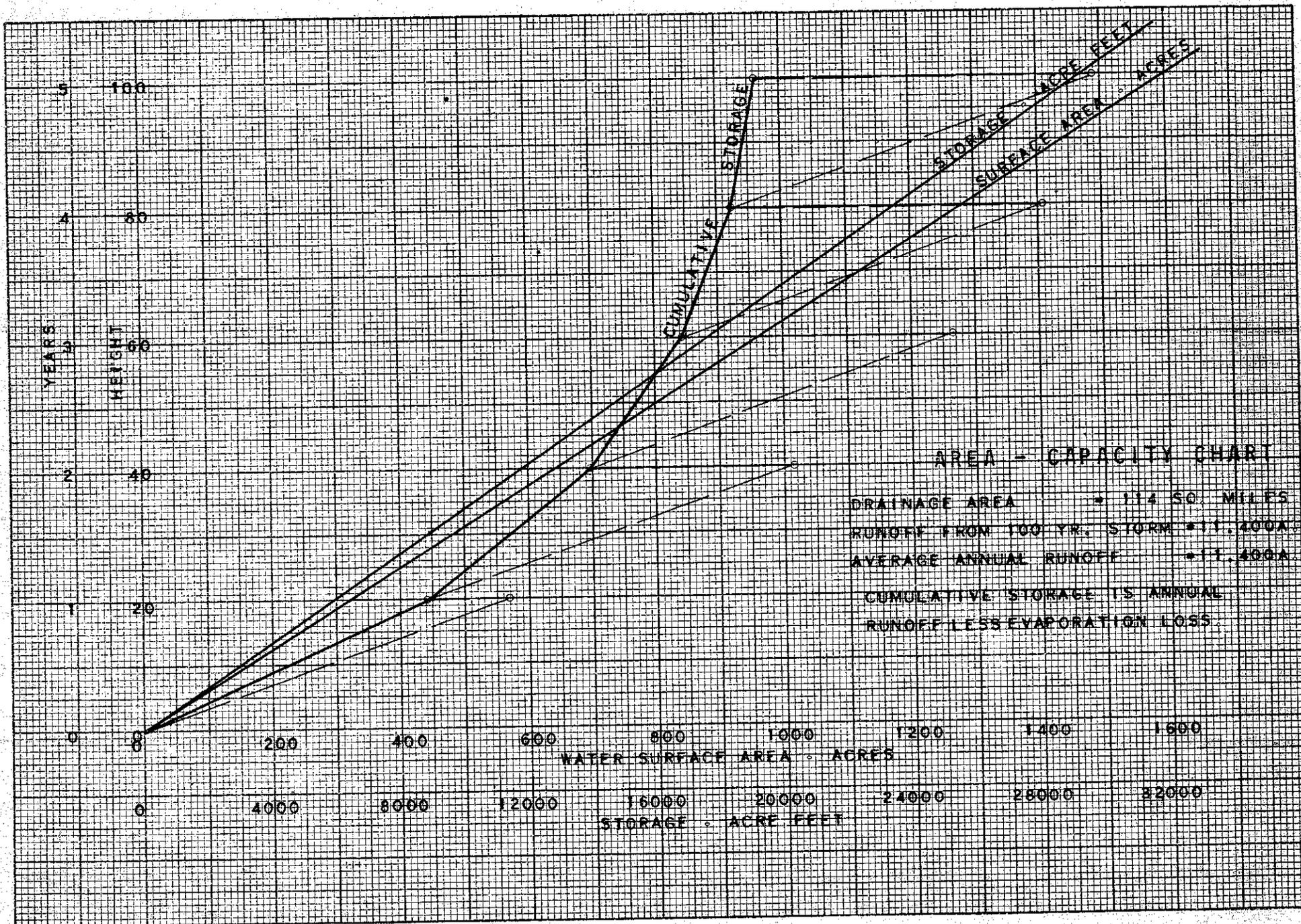
The Santa Fe Railroad Company.

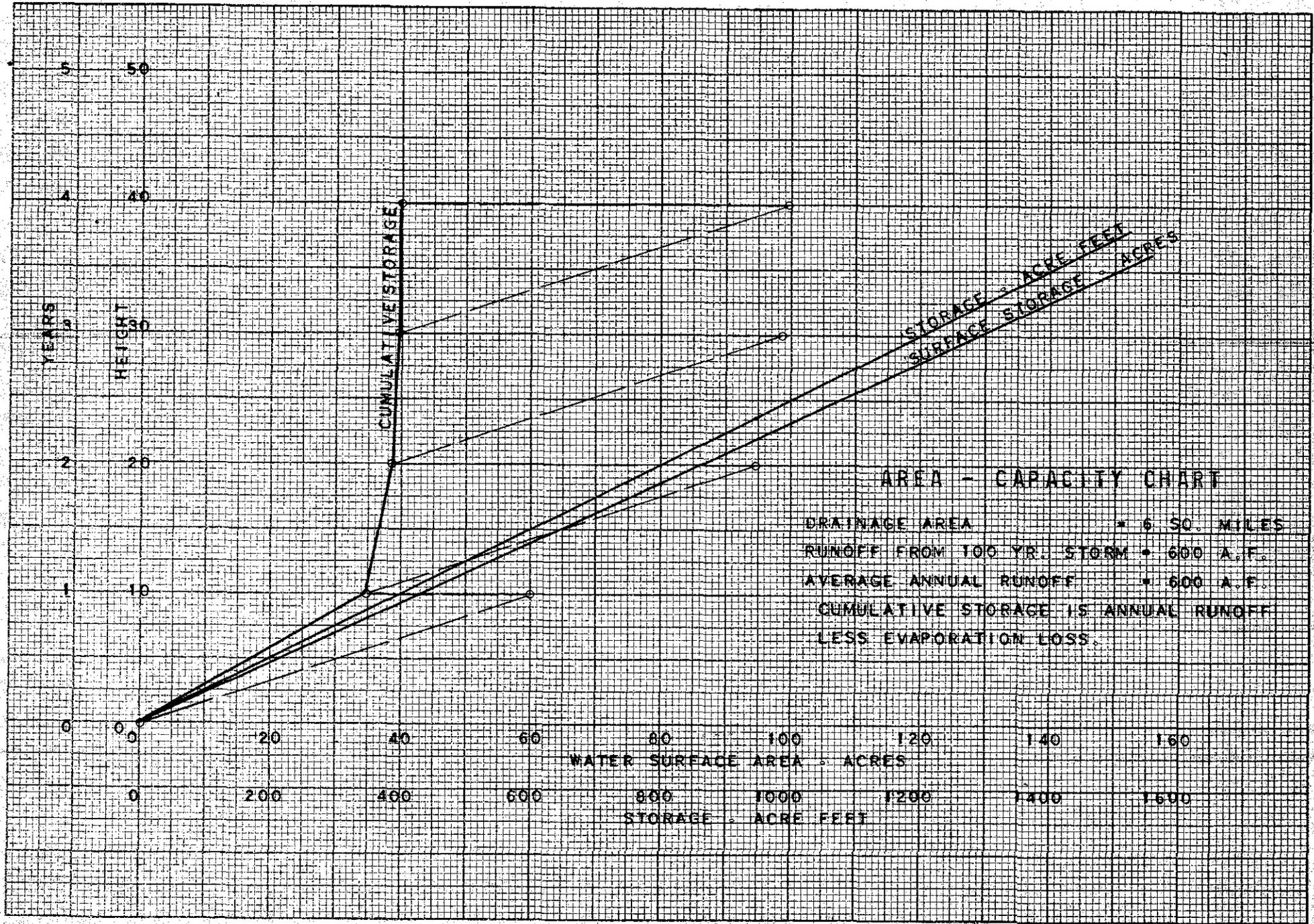
The ratio of contribution from these parties and agencies would be determined after a more complete and substantial estimate of cost is determined and the desirability of the project more definitely established.

ESTIMATE OF COST TO COMPLETE STUDY AND
PRELIMINARY DESIGN

1. Geologist, Study of foundation and reservoir.	\$ 1,000
2. Soils tests.	\$ 1,000
3. Consulting Engineer, further study, damages, benefits, economic study, conferences.	\$ 1,000
4. Reproduction and reports	\$ <u>250</u>
TOTAL	\$ 3,250

Due to the developed area lying along the lower reaches of Sols Wash and within the path of possible floods in the event of dam failure, considerable investigation of the foundation of the dam, construction materials and reservoir should be made. The services of a qualified Geologist should be sought to assure a safe dam design to prevent possible loss of life and property, and to determine the feasibility of the proposed dam and reservoir for recreational purposes.





January 16, 1961

FLYING "E" WASH DAM

Located in the SW 1/4 of Section 9, T7N, R5W
Gila and Salt River Meridian

Project "C"

The Flying "E" Wash, so named because of its source and major portion of its length and drainage area lying within what is known locally as the Flying "E" Ranch, causes considerable damage to the Country Club property in the lower reaches of the wash during heavy runoff periods. The extent and frequency of these flood periods also prevent the development of large areas of property along the lower reaches of this wash. The drainage area above the proposed dam site is approximately 9 square miles.

While the major portion of these areas are privately owned, their development contributes not only to the local economy but to the economy of the County and the State.

The Country Club is owned by individual stockholders. This property consists of a clubhouse, 9-hole golf course with its related improvements, and an area sufficient for enlargement to an 18-hole golf course. During the periods of heavy runoff, large quantities of boulders, gravel, silt and other debris is deposited on the greens and fairways, and many rivulets of varying proportions erode through the area. The clean-up of deposits and the repair of the eroded areas is a constant source of expense and results in extended periods of the club being inactive. These idle periods have been as long as three weeks.

The Wickenburg Country Club is the only recreational facility of its kind in the vicinity and is patronized to a large extent by guests of the various Dude Ranches for which the Wickenburg area is well known.

Wickenburg is known as the "Dude Ranch Capitol of the World" and the revenue from these Dude Ranches contributes a major portion of the local economy. This revenue is also reflected in the economy of the Maricopa County and of the State.

The water controlled and stored by the proposed dam and reservoir would provide water for stock and provide a greater ground water supply for other purposes such as irrigation and domestic use. While these benefits may not be of major importance, they should be considered in the appraisal of the project's feasibility.

CONSTRUCTION ITEMS INVOLVED

1. Construction of Project "C" Dam, maximum height 20 feet; Length at crest 1,000 feet, = 45,000 cubic yards.
2. Clearing of approximately 135 acres of dam and reservoir area.
3. Construction of spillway.
4. Construction of controlled outlet at the dam.

The dam would be of earthfill construction material, which appears to be suitable, is available within the limits of the proposed reservoir area. Clearing of the reservoir area would consist of the removal and disposal of a light growth of brush and other light vegetation peculiar to the desert area. The spillway would be excavated through a ridge at the east edge of the proposed reservoir to a small ravine which returns to the Flying "E" Wash above U. S. Highway 60-70. This spillway and tailrace should be protected with stone or rock to prevent erosion.

PRELIMINARY ESTIMATE OF CONSTRUCTION COST

(Items listed above)

1. \$ 45,000
 2. \$ 5,000
 3. \$ 5,000
 4. \$ 4,000
 5. None
- Total \$ 59,000

The owner of the property upon which the proposed dam site has stated that he will donate the necessary property for the project.

PRELIMINARY ESTIMATE OF BENEFITS

The State Highway Department's bridge over the Flying "E" Wash a short distance below, north, of the proposed dam site shows evidence of having received repair and protection work. The State Highway Department has no records of the cost involved due to the major portion of the maintenance and protection work having been done by regular maintenance employees. The costs of these forces have not been segregated to include this work as an individual item. For the purpose of this report, however, the average annual costs to the State Highway Department will be estimated to be \$500 per year.

The officers of the Country Club have estimated their flood damage repair cost and loss of revenue to be approximately \$3,500 per year.

The Santa Fe Railroad Bridge crossing this wash a short distance below the Country Club and above its confluence with Sols Wash also shows evidence of having experienced flood damages in the past. The Railroad Company has made considerable improvements in the immediate vicinity of the bridge such as bank protection, channelization, channel clearing and other correction installation in order to eliminate or minimize damages in the future. Efforts to determine approximate damage cost figures from the Railroad Company did not bring to light any specific amount from any specific place. Therefore, for the purpose of this report, an average annual cost to the Santa Fe Railroad will be estimated to be \$500 per year.

DAMAGES - BENEFITS

Damages - Average annual:

1. Country Club	\$ 3,500
2. State Highway Department	\$ 500
3. Santa Fe Railroad	\$ <u>500</u>

TOTAL \$ 4,500

Estimated Cost of Project \$ 59,000

Amortized in 50 years - \$59,000 x .05478 \$ 3,232

Maintenance and operation \$1,000 per year \$ 1,000

Total Estimated Annual Cost of Project \$ 4,232

Benefit - Cost Ratio - 1.06 to 1.0

SUGGESTED COST PARTICIPATION

No actual damages or loss excepting damages to portions of the golf course of the Country Club, and the loss of revenue during periods of floods and periods necessary for repairs, can be reasonably determined. The Country Club being the only recreational facility of its kind in the area and is extensively patronized by vacationers does contribute to the local economy. For this reason a modest portion of the cost of the project could be borne by the Maricopa Country Flood Control District.

The threats of more serious floods which could cause considerable damage to the U. S. Highway 60-70 and to the Santa Fe Railroad, is always in the offing.

A considerable area of property along this wash and which lies between the State Highway and the Country Club could be developed if flood waters were controlled. The present property owners of these areas would derive considerably more benefit from this factor than would the community. For this reason the property owners are included in the suggested list of contributors.

Following are the suggested contributors to the cost of the project:

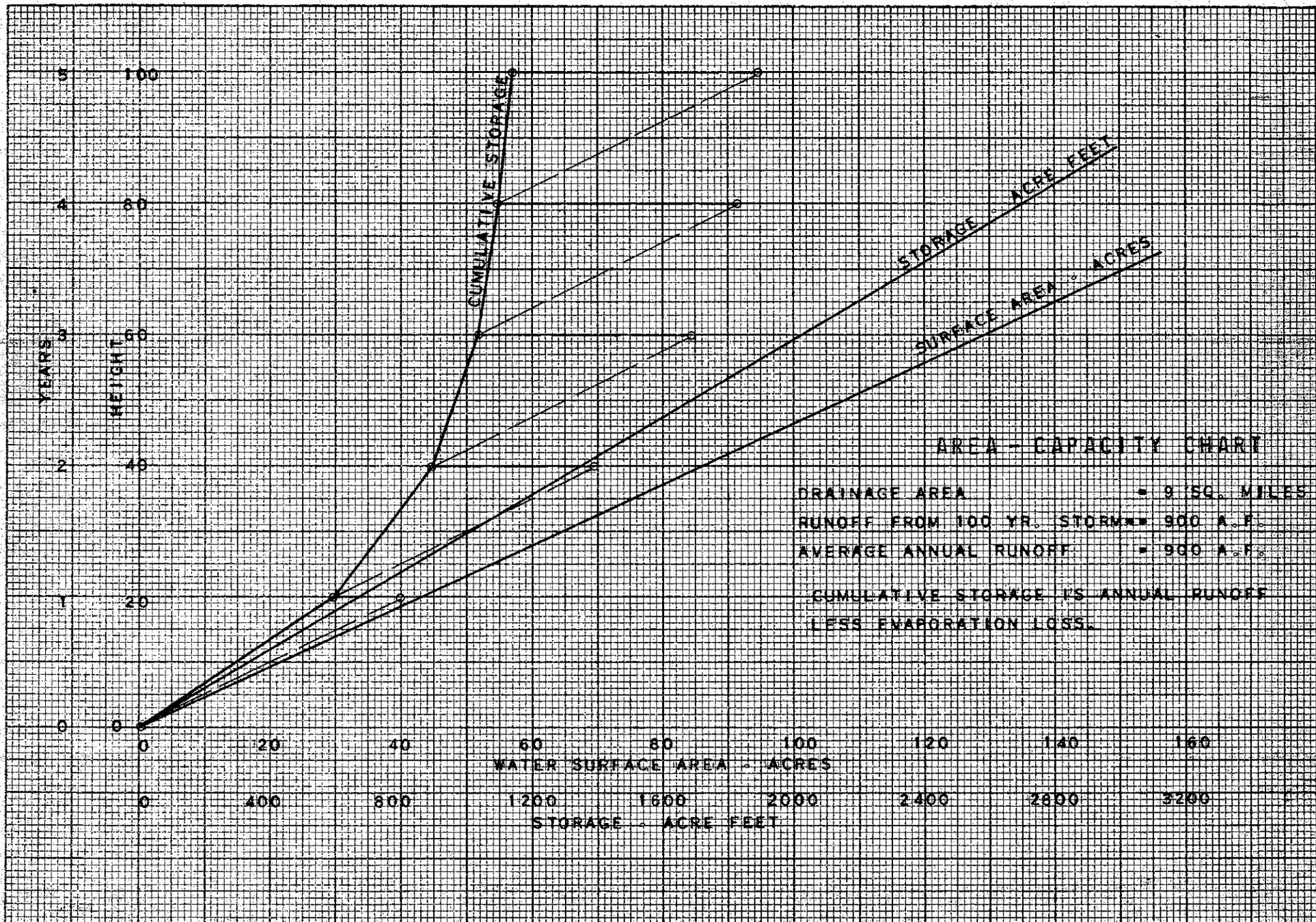
1. Dude Ranch owners and operators.
2. Owners of the property to be protected for development.
3. Country Club.
4. Maricopa County Flood Control District.
5. Santa Fe Railroad Company.
6. State Highway Department.

In lieu of a project to control the waters from Flying "E" Wash, immediate steps should be taken to create a zoning law which would prohibit or control development in flooded areas.

ESTIMATED COST TO COMPLETE PROJECT STUDY

1. Soils Investigation.	\$ 500.00
2. Consulting Engineer, further investigation of stated damages, further contacts with State Highway and Santa Fe Railroad.	500.00
3. Preliminary Design.	300.00
4. Reproduction and reports.	<u>100.00</u>
TOTAL	\$1,400.00

Soils investigation is highly desirable to determine foundation of the dam and to determine suitability of available materials for construction.



BY Straub DATE 1/4/61
CHKD. BY DATE

SUBJECT Maricopa County
Flood Control

SHEET NO. OF
JOB NO. 1035

DATA ON
FLYING E WASH - PROJECT C

1. Drainage Area = 9 sq. miles
2. Average annual precipitation = 15.4 inches
 Stanton (10-yr. record - 15.4")
 Wickenburg (50-yr. record - 11.0")
 The precipitation at Stanton will be used for the average of this area as it more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm. (See Chart, Exhibit) = 4.2 inches
4. Assumed yield from annual average precipitation = 12% of total = 1.9"
 = $1.9 \times 53.3 \times 9$ = 900 Acre Feet
5. Assumed yield from 100-yr. storm is based on $\frac{1}{2}$ of the precipitation above the first $\frac{1}{2}$ " and would be $\frac{4.2 - 0.5}{2} = 1.9$ inches
 then $1.9 \times 53.3 \times 9$ = 900 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 4.5 miles
8. Slope of watershed averages 100' per mile

LOS CABELLEROS RANCH WASHES

(Fisher and McGuire Additions)

Project "D"

This project includes the construction of two small dams to control two washes which converge in the southwest section of the Town of Wickenburg. The flood waters from these washes cause considerable damages and inconvenience to the developed areas in the Fisher and McGuire Additions to the Town of Wickenburg. The other portion of this project is the installation of a storm sewer system through the two Additions mentioned above. The waters controlled and collected by this storm sewer (see Plate 17) would be the waters from numerous smaller washes and the immediate area.

The site of the two proposed dams is located in the SW 1/4 of Section 14, T.7N. R.5W., Gila and Salt River Meridian and approximately one and one quarter mile south of U.S. Highway 60-70. The washes to be controlled by these dams have their origin in the mountainous area approximately three miles southerly from Los Cabelleros Ranch and have a combined drainage area of approximately eleven square miles.

The lower reaches of this drainage passes through an area considerably developed, containing many homes of the medium price range and a few homes of a higher price range. Waters from this wash cause extensive damages to homes, lawns, shrubbery, streets and other structures common to residential areas. The existing channel or course of this wash is entirely inadequate to contain the waters from a heavy rainfall. The existing water course is narrow and winding, having been shifted at various places to provide room for development. For a portion of this water course, Sylvan Street between Park Street and the railroad becomes the channel by inverting the street crown.

The proposed dams and detension reservoirs for Project "D" are shown on Plate 2, and the location of the proposed storm sewer through Fisher and McGuire Additions is shown on Plate 17.

CONSTRUCTION FEATURES INVOLVED

The two proposed dams as described above would be constructed of earth fill. Material which appears to possess suitable construction qualities is available within the limits of the reservoir area.

A connecting channel would be constructed to discharge excess waters from the higher detention basin into the lower basin.

The spillway would be constructed to adequate proportions to discharge any excess waters from the two detention basins, back into the main wash. Because of the extensive development along the lower reaches of these washes, the design for these dams and detention basins should be adequate for a 100-year storm, to prevent possible loss of life.

Controlled outlet at the dam should be provided to permit a retarded evacuation of the reservoirs for selected periods. The volume of discharge from these controlled outlets should not be sufficient to cause damage or inconvenience within the developed areas below.

PRELIMINARY ESTIMATE OF CONSTRUCTION COST

1. Two dams	\$21,000
2. Clearing Reservoir Areas - 86 acres @ \$100	\$ 8,600
3. Connecting Channel	\$ 2,000
4. Spillway	\$ 3,000
5. Property	\$25,000
6. Storm Sewer	<u>\$25,000</u>
Total Estimated Cost	<u>\$84,600</u>
Amortized in 50 years - \$84,600 x .05478	\$ 4,634
Maintenance and Operation	<u>1,000</u>
Total Annual Cost	<u>\$ 5,634</u>

DAMAGES

Stated damages, extrapolated to include entire area, total an average annual damage cost of approximately \$5,500 per year.

Benefit-Cost Ratio - 0.98 to 1.0

The threat of disasterous floods through this area is ever present and the possibility of the resultant loss of life should be considered when evaluating this project.

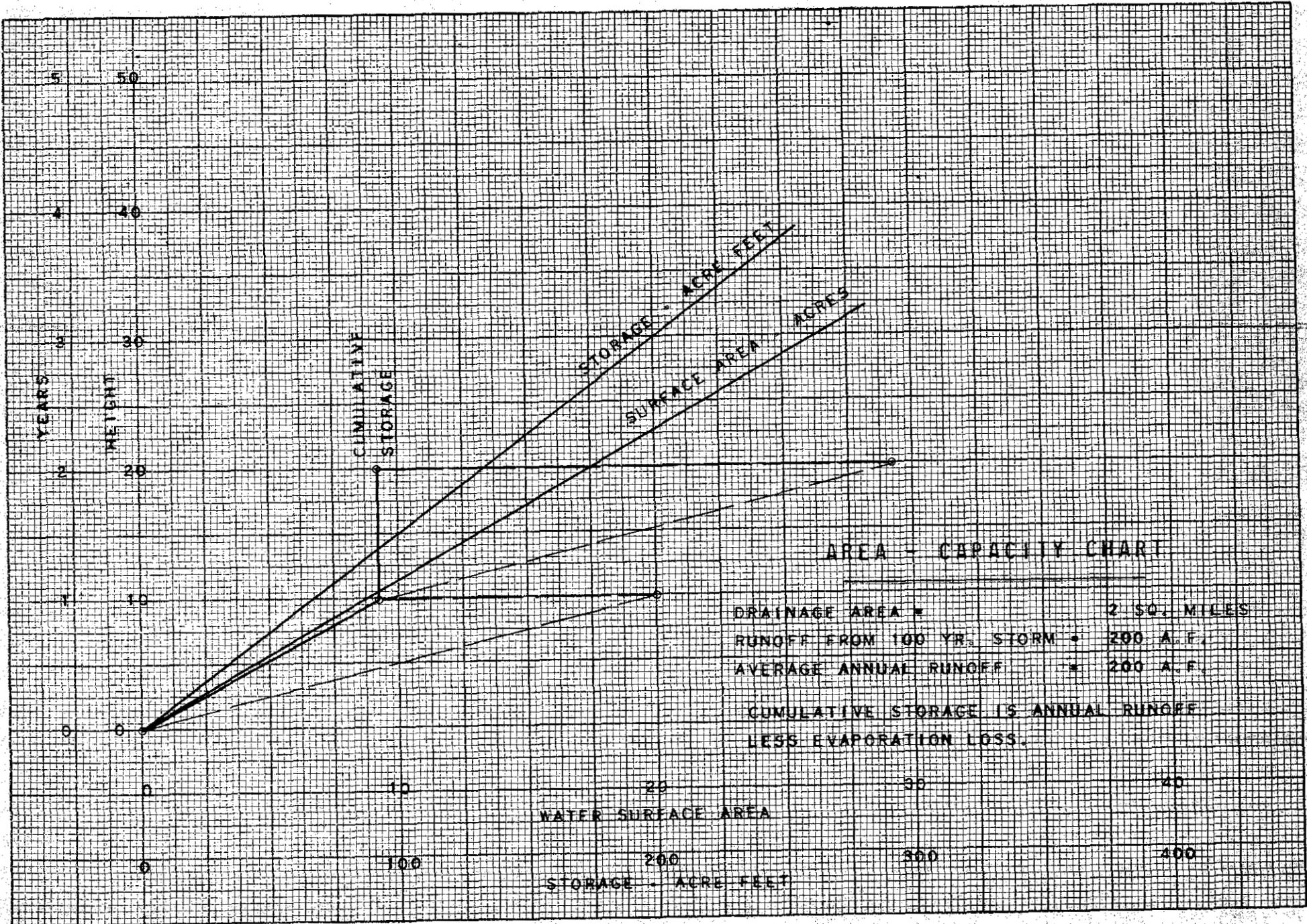
SUGGESTED CONSTRUCTION COST PARTICIPATION

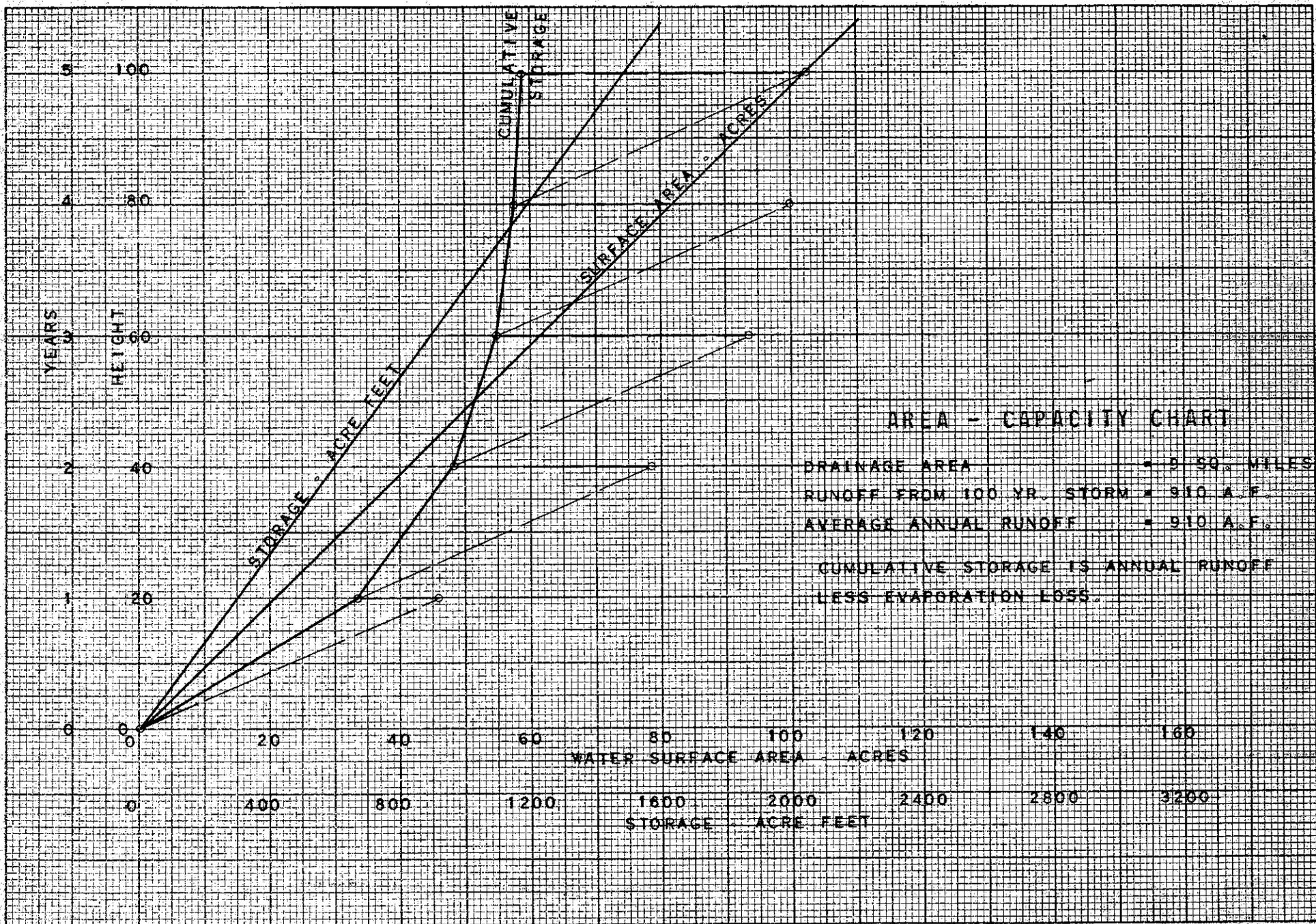
1. Maricopa County Flood Control District
2. Town of Wickenburg
3. Property owners for the storm drain portion of this project, formation of an Improvement District

Immediate steps should be taken to create adequate zoning laws to prohibit or control development within areas lying within unprotected areas and which are now undeveloped. This control should require the developer of these areas to provide adequate drainage for the protection of the property to be developed and the property in the lower reaches.

ESTIMATED COST TO COMPLETE STUDY

1. Soils Investigation	\$100.00
2. Consulting Engineer - Further investigation of property damages, preliminary design	\$200.00
3. Reproduction and Reports	<u>\$ 50.00</u>
Total	<u><u>\$350.00</u></u>





BY Straub DATE 1/5/61 SUBJECT Maricopa County SHEET NO. OF
 CHKD. BY DATE Filed Control JOB NO. 1038

DATA ON

LOS CABALLEROS RANCH - PROJECT D-1

1. Drainage Area = 2 sq. miles
2. Average annual precipitation = 15.4 inches
 Stanton (10-yr. record = 15.4")
 Wickenburg (50-yr. record = 11.0")
 The precipitation at Stanton will be used for the average of this area as it more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm. (See Chart, Exhibit) 4.2 inches
4. Assumed yield from annual average precipitation = 12% of total = 1.9"
 = 1.9" x 53.3 x 2 = 200 Acre Feet
5. Assumed yield from 100-yr. storm is based on $\frac{1}{2}$ of the precipitation above the first $\frac{1}{2}$ " and would be
 $\frac{4.2 - 0.5}{2} = 1.9$ inches
 then 1.9 x 53.3 x 2 = 200 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet / year
7. Length of watershed is approximately 3 miles
8. Slope of watershed averages 80' per mile

BY Staub DATE 1/5/61 SUBJECT Maricopa County SHEET NO. _____ OF _____
CHKD. BY _____ DATE _____ Flood Control JOB NO. 1038

DATA ON

LOS CABALLEROS RANCH - PROJECT D-2

1. Drainage Area = 9 sq. miles
2. Average annual precipitation = 15.4 inches
 Stanton (10-yr. record = 15.4")
 Wickenburg (50 yr. record = 11.0")
 The precipitation at Stanton will be used for the average of this area as it more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm. (See Chart, Exhibit) 4.2 inches
4. Assumed yield from annual average precipitation = 12% of total = 1.9"
 = $1.9 \times 53.3 \times 9$ 910 Acre Feet
5. Assumed yield from 100-yr. storm is based on $\frac{1}{2}$ of the precipitation above the first $\frac{1}{2}$ " and would be $\frac{4.2 - 0.5}{2} = 1.9$ inches
 then $1.9 \times 53.3 \times 9$ 910 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 9 miles
8. Slope of watershed averages 40' per mile

COUNTRY CLUB ROAD DAM

(Reed's Addition)

Project "E"

Reed's Addition, an area of considerable residential development, lies in the northwest section of the Town of Wickenburg. An unnamed wash crosses this area and causes considerable damage and inconvenience during periods of heavy rainfall and runoff.

Previous study made for the control of this wash made by the Town's officials resulted in the recommendation that a dike and diversion channel be constructed to divert waters into Sols Wash. Mr. Stifel, City Manager, stated that right of way opposition was encountered and the project temporarily abandoned.

Further study has indicated that the wash can be controlled by the construction of a dam and detention basin in the vicinity of the junction of the Country Club Road and U.S. Highway 60-70. This proposed dam which would also carry the Country Club Road on its crest, is situated approximately three hundred feet north of U.S. Highway 60-70, on the Country Club Road, and in the extreme west portion of the NW 1/4, Section II, T.7 N. R.5 W., Gila and Salt River Meridian.

The wash to be controlled has its origin in the Vicinity of Los Cabelleros Ranch and has a drainage area of approximately two square miles. The spillway from the proposed detention basin would be excavated through a ridge forming the north rim of the reservoir, emptying into a small wash returning to the main wash. See Plate 2.

Between the proposed dam and a point near the intersection of El Tecalote Drive and Avispa Street at the west line of Reed's Addition, waters from the controlled outlet at the dam and the accumulated waters from various minor washes and immediate area, would flow in the existing channel. From the street intersection described above, a storm sewer should be installed to an outlet near the Santa Fe Railroad, from which outlet waters would flow in the existing channel to Sols Wash. This proposed storm sewer is shown on Plate 16. Flood zoning laws should control future development of the flooded area between the proposed dam and Avispa Street, requiring the developer to provide adequate storm drain facilities through the area to be developed.

The proposed dam would be of earth fill construction with a height of 20 feet and a length at its crest of approximately 300 feet. The width of the top of dam would be approximately 30 feet to accommodate the roadway for the Country Club Road. Slopes of the proposed dam would be 2:1, both upstream and downstream.

Controlled outlet at the proposed dam would permit a retarded evacuation of the reservoir and in such volumes as to not create water damages in the lower reaches of the drainage.

Because of the considerable development in the lower reaches of the wash, the proposed dam and spillway should be designed to be adequate for a 100-year storm.

Benefits from the control of these waters can be considered only that resulting from flood control and determined from the declared amount of flood damages incurred for a given period of time.

PRELIMINARY ESTIMATE OF CONSTRUCTION COST

1. Dam, 6,000 C.Y. @ \$1	\$ 6,000
2. Controlled Outlet	3,000
3. Spillway	3,000
4. Clearing of Reservoir, 21 acres @ \$100	2,100
5. Property - 30 acres @ \$500	15,000
6. Storm Sewer, 2,000 feet @ \$12	<u>24,000</u>
Total Estimated Cost	<u>\$53,100</u>
Amortized in 50 years \$53,100 x .05478	\$ 2,909
Maintenance - Annual	<u>500</u>
Total Estimated Annual Cost	<u>\$ 3,409</u>

PRELIMINARY ESTIMATE OF BENEFITS

The only tangible benefit which can be claimed for this project is the control of flood waters which would eliminate the frequent occurrence of the floods which frequently cause damage to homes, streets and other improvements in Reed's Addition which are common to residential areas.

The number of homes within Reed's Addition which have been affected by floods in the past total 48. This number could be materially increased by further development in the upper reaches of this wash which would increase the runoff, and by the occurrence of more severe storms of less frequency.

The flood damages to homes and yards in Reed's Addition area which has been determined by a survey conducted by the Town of Wickenburg may be assumed to be \$3,000 annually. The costs of repairing flood damage to streets and for general clean-up after storms as determined by the Town of Wickenburg amounts to approximately \$500 annually.

Total amount of benefits (annually)	\$ 3,500
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Benefit-Cost Ratio 1.03 to 1.0

SUGGESTED CONSTRUCTION COST PARTICIPATION

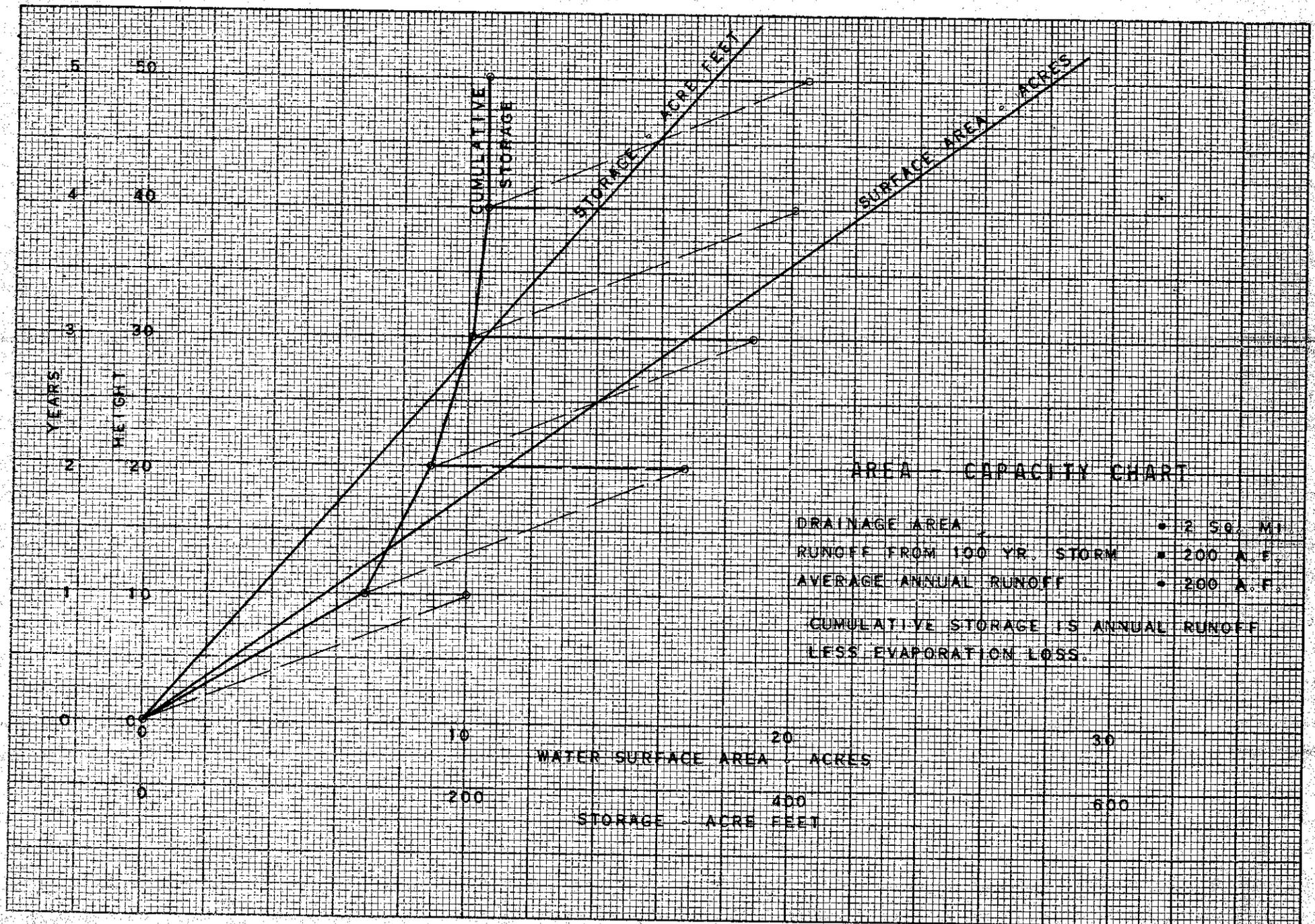
For the proposed dam and reservoir, the costs should be borne by the Maricopa County Flood Control District and the Town of Wickenburg.

The costs of installing the storm sewer as previously outlined should be shared by:

1. Maricopa County Flood Control District
2. Town of Wickenburg
3. Owners of adjacent and affected property through the formation of a Public Improvement District and in such a manner as would spread the payments of the cost over a period of several years.

ESTIMATED COST TO COMPLETE STUDY

1. Soils Investigation and Testing	\$250
2. Consulting Engineer - For further dam site investigation, property values, drawings	\$200
3. Reproduction, Reports	<u>\$ 50</u>
Total	<u><u>\$500</u></u>



PROJECT E - COUNTRY CLUB ROAD DAM (REED'S ADDITION)

BY Straub DATE 1/5/61 SUBJECT Maricopa County SHEET NO. _____ OF _____
 CHKD. BY _____ DATE _____ Flood Control JOB NO. 1038

DATA ON
COUNTRY CLUB ROAD DAM (REED'S ADDITION) - PROJECT E

1. Drainage Area = 2 sq. mile
2. Average annual precipitation = 15.4 inches
 Stanton (10-yr. record = 15.4")
 Wickenburg (50-yr. record = 11.0")
 The precipitation at Stanton will be used for the average of this area as it more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm. (See Chart, Exhibit) = 4.2 inches
4. Assumed yield from annual average precipitation = 12% of total = 1.9"
 = $1.9 \times 53.3 \times 2$ = 200 Acre Feet
5. Assumed yield from 100-yr. storm is based on $\frac{1}{2}$ of the precipitation above the first $\frac{1}{2}$ ", and would be
 $\frac{4.2 - 0.5}{2} = 1.9$ inches
 then $1.9 \times 53.3 \times 2$ = 200 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 2 miles
8. Slope of watershed averages 130' per mile

POWDER HOUSE WASH

Project "F"

Powder House Wash heads in the mountainous area approximately six miles northeast of the Town of Wickenburg. The flow of this wash is in a southwesterly direction and empties into the Hassayampa River in the area known as East Wickenburg, which lies within the limits of the Town of Wickenburg.

Along the lower reaches of this wash is an area of considerable development including a trailer court, service stations and a few homes of medium price range. Efforts have been made to confine the channel of this wash by the construction of dikes and channels. However, due to the encroachment of various developments, the remaining channel areas are not sufficient to control the excess runoff from the heavy rainfall which occurs frequently. The overflow during these periods causes considerable damage to the developed area and disrupts business for periods of various lengths. The estimated cost of repairing damages and general clean-up after these storms has been stated as being approximately \$1,500 annually to the trailer court alone. The estimated cost to the Town of Wickenburg for repair of damages to streets and other public improvements and for the necessary general clean-up after storms approximates \$1,000 annually.

Consideration has been given to the construction of a small dam in this wash to create a lake for recreational purposes as well as to control the flood waters. The citizenry of Wickenburg are desirous of such a facility. However, the lake created behind this dam would approximate only 25 acres, which is not of sufficient area to make such a project attractive to the Game and Fish Commission. The drainage area above this proposed dam site is not of sufficient area nor does the periods of heavy rainfall occur with sufficient frequency to maintain an adequate reservoir for fish survival, swimming and boating.

This proposed dam site is desirable for flood control purposes and would solve the problems of flood difficulty being experienced in the lower reaches of Powder House Wash. The proposed dam site lies in the SW 1/4 of Section 31, T.8N. R.4W., Gila and Salt River Meridian, Maricopa County, and in a narrow section of the wash below the reservoir area described above. The spillway would be excavated through the ridge forming the east edge of the reservoir and would empty into the wash lying east of Powder House Wash.

The area surrounding the proposed reservoir has many attractive features from a recreational standpoint. The growth of Palo Verde, Ironwood and other trees and bushes native to the area may be considered heavy. Cactaceous growth such as Cholla, Saguaro, Ocotillo and other varieties are in abundance. The rugged mountains which rim the area may be viewed in every direction. Ramadas, fireplaces, and other picnic facilities may be installed in considerable number. Access roads to the area, horse trails and hiking paths may be constructed with comparative low cost. This area has the many attractive recreational features listed above and may, for certain periods, have sufficient water storage for limited boating and swimming. However, as previously stated, it is believed that sufficient water will not be available to maintain a constant reservoir of sufficient volume to receive the support of the Game and Fish Commission.

This project should be considered only as a flood control project, other possible benefits and advantages being only incidental.

The proposed dam would be of earth fill construction. Material for the dam construction of apparent suitable qualities is available within the reservoir area.

A controlled outlet should be installed in the dam to regulate the water level above the dam.

The proposed spillway would be excavated through the ridge forming the east rim of the reservoir. Rock for protection against erosion, if necessary, may be obtained in the near vicinity.

Clearing of the proposed reservoir would consist of the removal and disposal of a moderate growth of trees, brush and cactus, and the relocation of the existing power line which crosses the proposed reservoir site.

CONSTRUCTION ITEMS INVOLVED

1. Earth dam, 40 feet in height, 80 feet in length at the crest, slopes 2-1/2:1 and 2:1
2. Reservoir clearing, 25 acres
3. Controlled outlet
4. Spillway and
5. Relocation of power line

PRELIMINARY ESTIMATE OF CONSTRUCTION COST

(Items above)

1. 35,000 cubic yards @ \$1	\$35,000
2. 25 acres @ \$100	2,500
3. Controlled outlet	5,000
4. Spillway	5,000
5. Relocation of power line	2,500
6. Property - 50 acres @ \$300	<u>15,000</u>
Total Estimated Cost	\$65,000
Amortized in 50 years \$65,000 x .05478	3,561
Maintenance and Operation -- annual	<u>500</u>
Total Annual Cost	<u>\$ 4,061</u>

ESTIMATED FLOOD BENEFITS

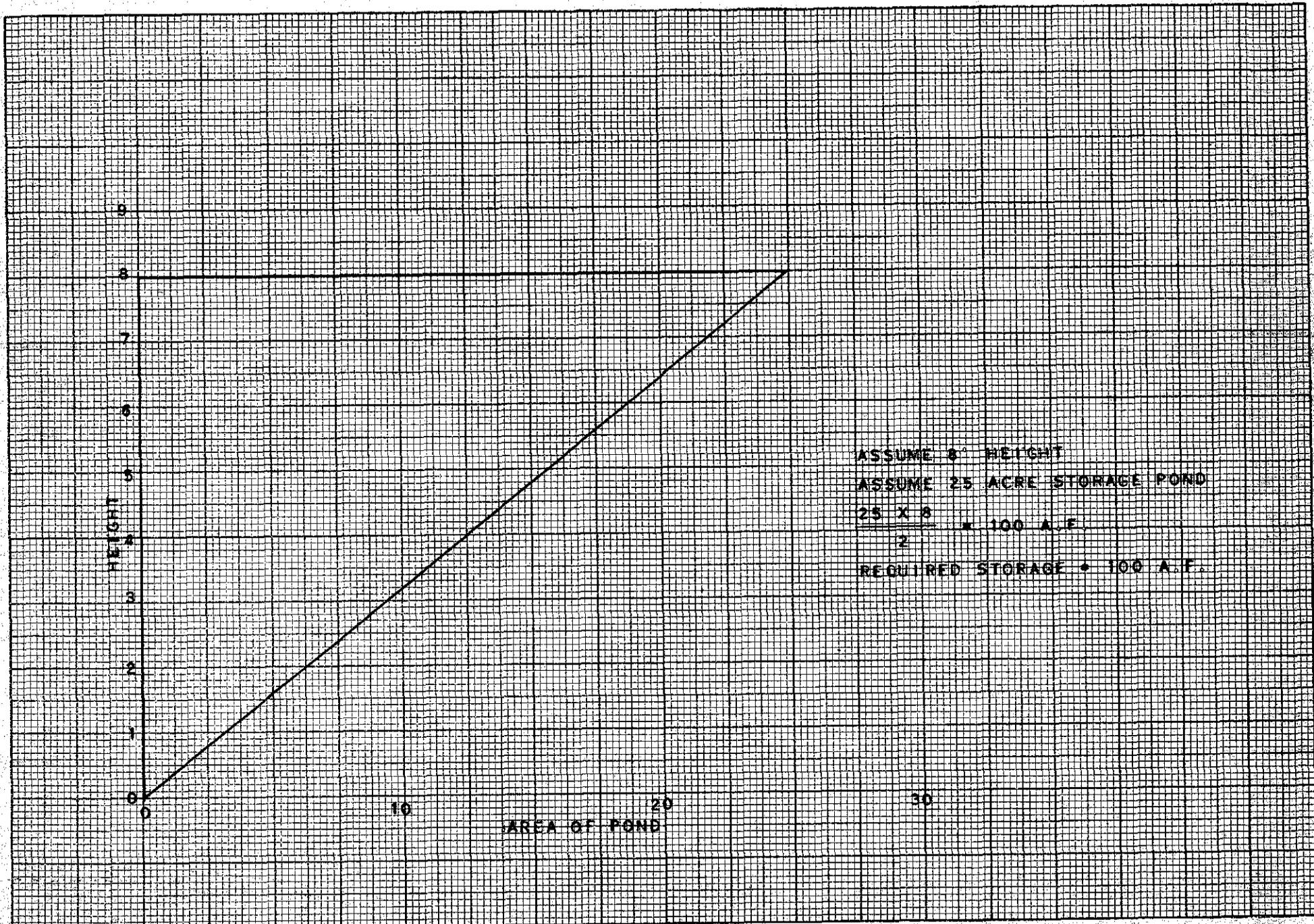
Trailer Court	\$ 1,500
City	1,000
Others (Estimates)	<u>3,000</u>
Estimated Total Annual Benefits	<u>\$ 5,500</u>

Benefit-Cost Ratio 1.35 to 1.0

ESTIMATED COST TO COMPLETE STUDY

1. Geologist	\$ 150
2. Soils Investigation for Foundation and Construction Materials	200
3. Consulting Engineer	250
4. Reproduction and Reports	<u>100</u>
Total	<u>\$ 700</u>

Due to the developed area near the mouth of Powder House Wash, sufficient investigation of dam foundation, construction materials, and the water retaining qualities of the reservoir should be made to not only prove the feasibility of the project, but also for the protection of life and property below. Geological information should govern the design of the project to insure full safety.



ASSUME 8' HEIGHT
ASSUME 25 ACRE STORAGE POND
 $\frac{25 \times 8}{2} = 100 \text{ A.F.}$
REQUIRED STORAGE = 100 A.F.

STORAGE CAPACITY CHART - POWDER HOUSE WASH - PROJECT F EXHIBIT

BY Strawb DATE 1/1/61 SUBJECT Maricopa County SHEET NO. _____ OF _____
 CHKD. BY _____ DATE _____ Flood Control JOB NO. 1058

DATA ON
POWDER HOUSE WASH. - PROJECT F

1. Drainage Area 1 sq. mile
2. Average annual precipitation = 15.4 inches
 Stanton (10-yr. record = 15.4")
 Wickenburg (50-yr. record = 11.0")
 The precipitation at Stanton will be used for the average of this area as it more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm. (See Chart, Exhibit) 4.2 inches
4. Assumed yield from annual average precipitation = 12% of total = 1.9"
 = $1.9 \times 53.3 \times$ = 100 Acre Feet
5. Assumed yield from 100-yr. storm is based on $\frac{1}{2}$ of the precipitation above the first $\frac{1}{2}$ ", and would be
 $\frac{4.2 - 0.5}{2} = 1.9$ inches
 then $1.9 \times 53.3 \times$ = 100 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 1.7 miles
8. Slope of watershed averages 400' per mile

January 16, 1961

WEST AND SOUTH SLOPES OF WHITE TANK MOUNTAINS

Project "G"

During periods of heavy rainfall the west and south slopes of White Tank Mountains discharge large volumes of water into the various washes forming the drainage system. The main portion of White Tank Mountains rise from an elevation of approximately 1,040 feet above sea level to an elevation of 4,000 feet. Below the elevation of 1,040 feet the terrain flattens to an elevation of approximately 850 feet at the Gila River in a distance of approximately 8 miles to the south. The greater portion of this flattened area is under cultivation, being served by the Roosevelt Irrigation Canal, Buckeye Irrigation Canal, Arlington Canal and many pumps and wells.

During periods of heavy rainfall and run-off considerable damage is suffered by the canals listed above and in the cultivated areas. The Roosevelt Irrigation District has provided spillways at several of the major washes which were intended to collect these flood waters into the canal. The District also provided emergency spillways in the lower levee of the canal to discharge excess waters into the areas below. While these spillways are adequate for average run-offs they have failed at various times during heavy storms. When these spillways become inadequate and fail, large volumes of water are discharged into the cultivated lands below and onto the canals of the Buckeye and Arlington Irrigation Districts, with similar damages and interruptions in water delivery as experienced by the Roosevelt Irrigation District.

In the path of flash floods frequently occurring in these washes lies the U. S. Highway 80-90 and the main line of the Southern Pacific Railroad. The services of these facilities have been interrupted at various times due to wash outs of sections of roadways and drainage structures. Aside from the economic loss due to the transportation delay is the cost of repair and cleanup of the roadways, structures and rights of way.

Among the indeterminate damage costs and economic losses due to the excessive run-off are:

1. Damage to crops due to flood waters.
2. Repair of rivulets and cleanup of fields.
3. Damage to crops due to interruption of irrigation water delivery while canals are being repaired.
4. Preventing the development of certain lands for cultivation.

5. Loss of water for additional irrigation which presently is lost in the Hassayampa and Gila Rivers and is beyond recovery.
6. Interruption of transportation.
7. Interruption of business.
8. Interruption of agricultural activities.
9. Prevention of certain developments due to fear and anticipation of damage to or destruction of, these improvements or developments due to potential floods.
10. Due to the cost accounting methods used in former years by the State Highway Department these costs must also be included in this category. While considerable damage is declared by the Highway maintenance department definite costs for specific items can not be obtained.
11. The costs for repair and cleanup of County roads in the flood area, like those of the State Highway Department, cannot be defined between flood damage and normal maintenance. Damage to County roads is declared and is evident but no specific amount can be applied to a specific operation.

The project as proposed for the control of flood waters from the west and south slopes of White Tank Mountains has a two fold purpose, that of flood control and that of water conservation and storage to recharge the sub-terranean water supply through percolation. While this stored supply of water may not be sufficient to place additional lands under irrigation, it will raise the present water table and substantially reduce the costs of pumping to lands now under cultivation. This benefit, while not a tangible item, is recognized as a substantial additional water source and a considerable saving in pumping operations.

The proposed project would consist of the construction of a dike of variable height approximately fourteen miles in length. The dike would maintain a uniform top elevation, utilizing the areas above the dike as detention basins. Controlled outlets would be installed as dictated by needs. At the lower and west end of this dike system, an emergency spillway would be constructed through the ridge which forms the east bank of the Hassayampa River, through which spillway would be discharged the excess waters not contained in the storage basins. The project should be so designed that it will be adequate for a 100 year storm, eliminating the probability that the spillway will be required to function more often than once each 100 years.

The flood waters from these slopes of the White Tank Mountains which are estimated to total approximately 20,000 second feet at the peak run-off, contribute to the total flow in the Hassayampa River, the lower reaches of which are subjected to considerable damage during flood periods.

FLOOD DAMAGES

For the purpose of this preliminary discussion, the value for damages to cultivated lands which are subject to floods is estimated to be \$12 per acre per year. Approximately 20,000 acres of cultivated land lies within this flood plane area.

The Buckeye Irrigation District's costs during the flood of late August, 1951, total an estimated \$16,000. \$11,000 of this total was to replace the siphon across the Hassayampa River. The remaining \$5,000 is to apply to the repair of 20 canal wash-outs at an estimated cost of \$250 each.

During the flood mentioned above, the Arlington Canal suffered about 15 wash-outs. In lieu of actual damage cost figures the cost of repair is estimated to be the same as that of the Buckeye Irrigation Canal, or a total of \$3,750.

The Roosevelt Irrigation District's Canal suffered fewer but larger wash-outs. Five major wash-outs for this area are reported. For the purpose of this report the estimated cost for repair of each wash-out is assumed to be approximately \$400 each or a total of \$2,000.

The above estimated costs for the three canals listed above does not include loss of water delivery, minor repairs, and general cleanup.

A conservative estimate of the cost of repairs to the Southern Pacific Railroad, State Highway, and County Roads is assumed average \$1,000 annually for each facility or a total of \$3,000.

Not all of the damages listed above can be attributed to the run-off from White Tank Mountains. Near the confluence of the Hassayampa and Gila Rivers the channel has grown up to a heavy vegetation consisting of salt cedars and other growth. This growth retards the flow in the rivers and causes the water to back up into the canals and spread over cultivated fields. Project "H" as described later in this report consists of cleaning and excavating adequate channels for both the Hassayampa and Gila Rivers, and, for the purpose of this report, will share equally with Project "G" the costs of flood damages in this area.

SUMMARY OF FLOOD DAMAGES PROJECTS "G" AND "H"

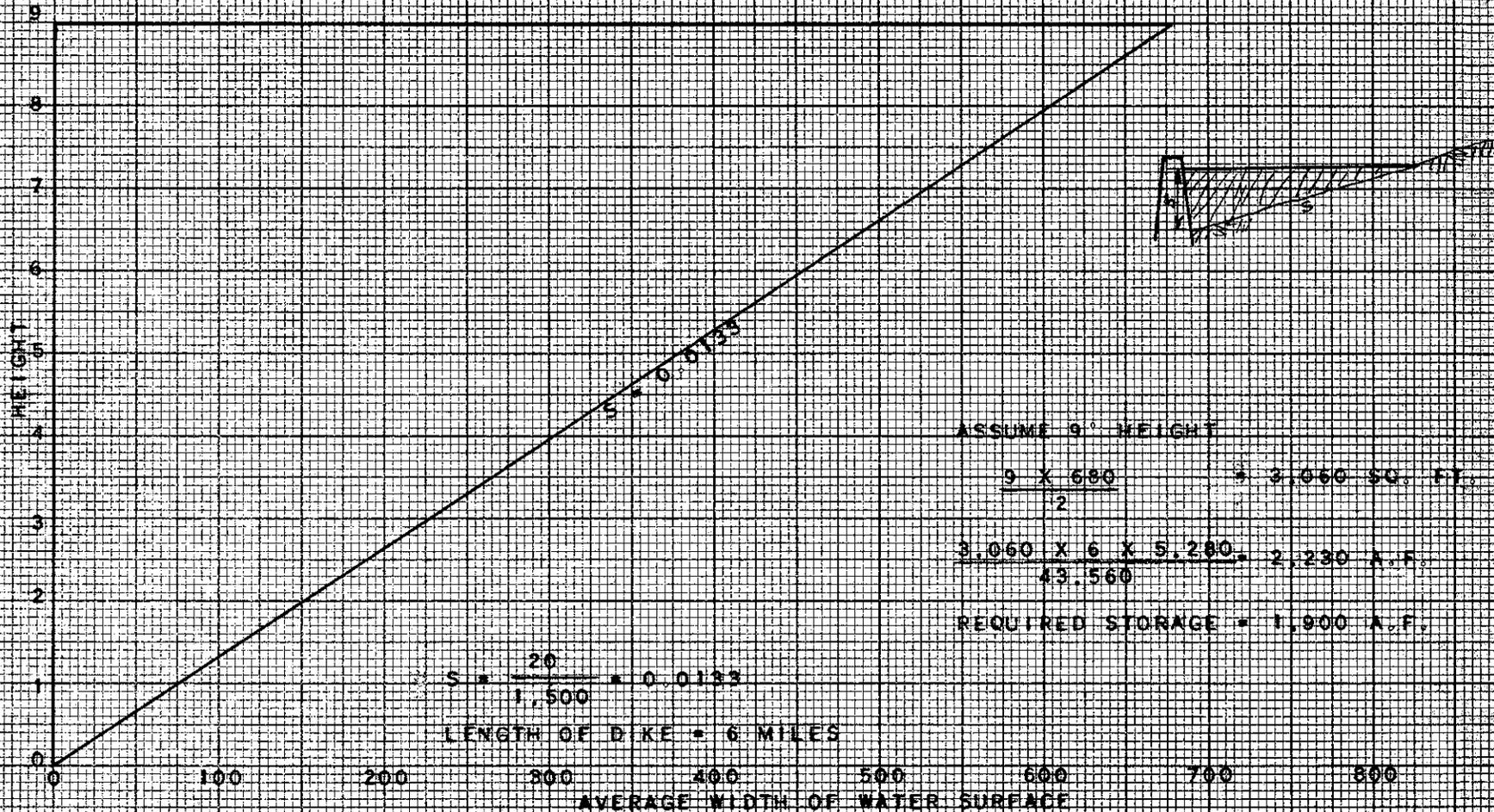
1. Agricultural lands 20,000 acres @ \$12	\$240,000
2. Buckeye Irrigation District	\$ 16,000
3. Arlington Irrigation District	\$ 3,800
4. Roosevelt Irrigation District	\$ 2,000
5. Southern Pacific Railroad	\$ 1,000
6. State Highway Department	\$ 1,000
7. Maricopa County Highway Department	<u>\$ 1,000</u>
TOTAL BENEFITS - Project G plus H	\$264,800

ESTIMATED CONSTRUCTION COST PROJECTS "G" AND "H"

Total Estimated Construction Cost Project "G"	\$2,000,000
Total Estimated Construction Cost Project "H"	\$ 350,000
Right of Way, 900 acres @ \$500	<u>\$ 450,000</u>
TOTAL	\$2,800,000
Amortized in 50 years $\$2,800,000 \times .05478 =$	\$ 153,384
Maintenance \$15,000 annually	<u>\$ 15,000</u>
Total Estimated Annual Cost	\$ 168,384
Total Benefits, Projects "G" and "H"	\$ 264,800
Benefit - Cost Ratio = 1.57 to 1.0	

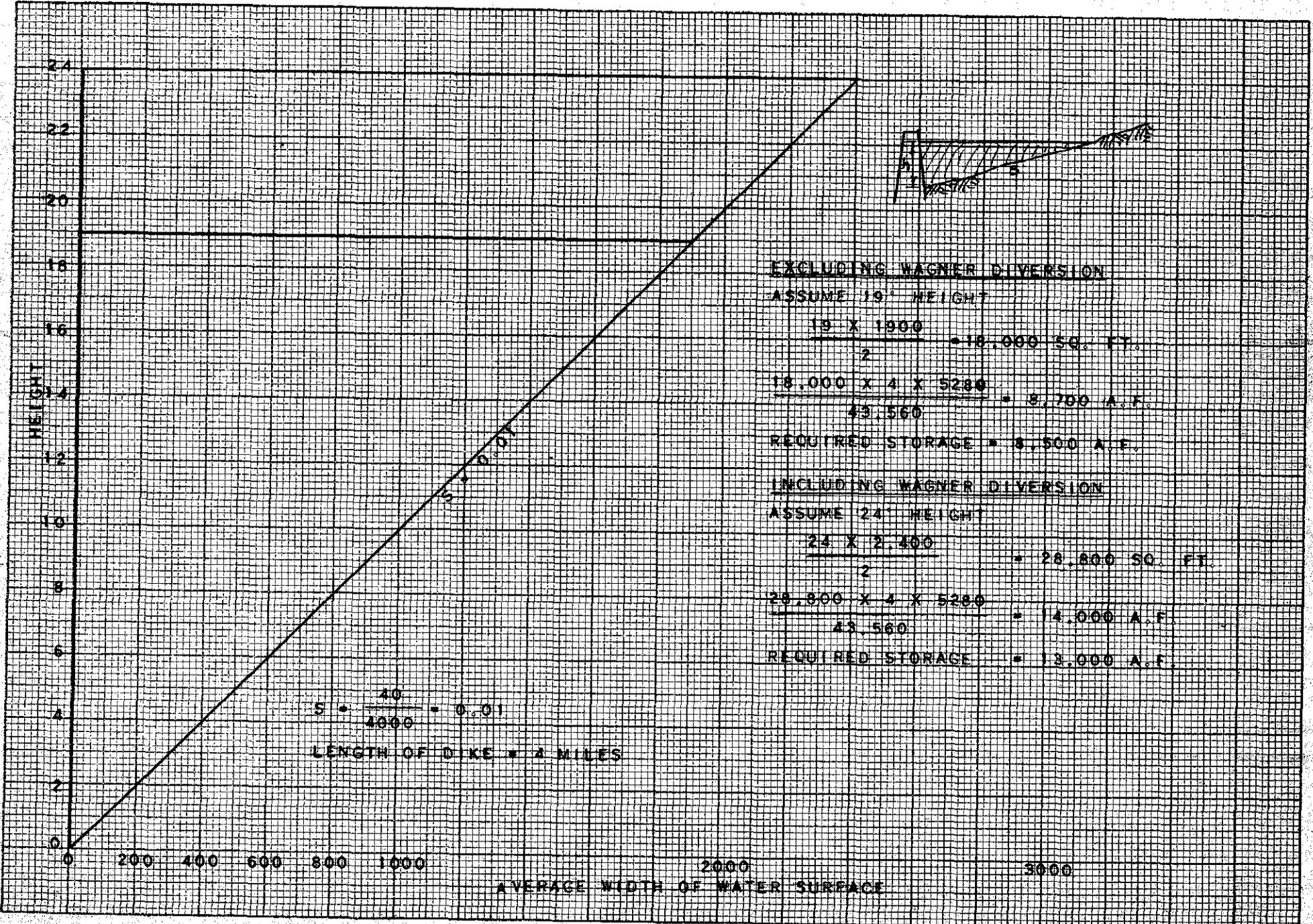
ESTIMATED COST TO COMPLETE STUDY

1. Soils investigation	\$ 800
2. Consulting Engineer, Preliminary Design, further damage investigation, conferences	\$ 1,350
3. Reproduction and Reports	\$ 400
4. Economist	<u>\$ 400</u>
TOTAL	\$ 2,950

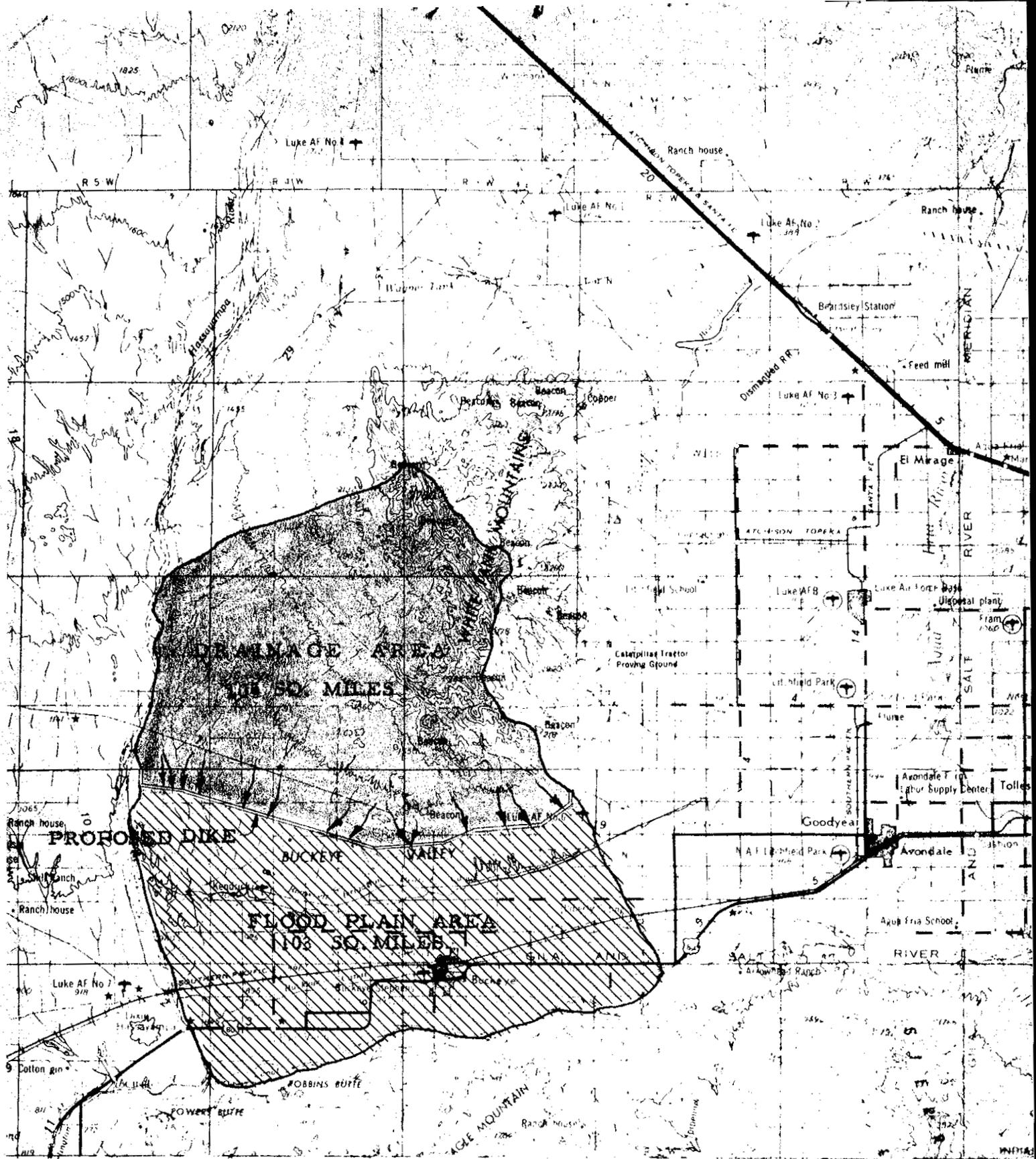


STORAGE CAPACITY CHART - AREA A THRU F

EXHIBIT



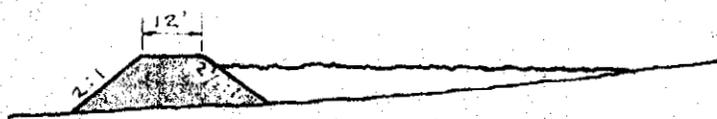
STORAGE CAPACITY CHART - AREA G THRU N



LOCATION MAP

OF THE

BUCKETEY WATERSHED



TYPICAL SECTION

BY Straub DATE 1/6/61 SUBJECT Maricopa County SHEET NO. _____ OF _____
 CHKD. BY _____ DATE _____ Flood Control JOB NO. 1038

DATA ON
BUCKEYE WATERSHED DIVERSION PROJECT
AREA A THROUGH F

1. Drainage Area = 19 sq. miles
2. Average annual precipitation = 9.3 inches
 Buckeye (58-yr. record - 7.5")
 Wickenburg (50-yr. record - 11.0")
 The average of the precipitation at the above two stations will be used since their higher elevation more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm (U.S. Soil Conservation Service) = 5.0 inches
4. Assumed yield from average annual precipitation = 12% of total = 1.1"
 = 1.1 x 53.3 x 19 = 1,100 Acre Feet
5. Assumed yield from 100-yr. storm (U.S. Soil Conservation Service)
 19 x 100 = 1,900 Acre Feet
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 6 Miles
8. Slope of watershed for lower areas averages 70' per mile
9. Slope of watershed for upper areas averages 500' per mile

DATA ON
BUCKEYE WATERSHED DIVERSION PROJECT
AREA G THROUGH N (EXCLUDING WAGNER DIVERSION)

1. Drainage Area 85 sq. miles

2. Average annual precipitation 9.3 inches
 Buckeye (58-yr. record = 7.5")
 Wickenburg (50-yr. record = 11.0")
 The average of the precipitation at the above two stations will be used since their higher elevation more nearly approximates the conditions for the drainage area.

3. Assumed precipitation from a 100-yr. storm (U.S. Soil Conservation Service) 5.0 inches

4. Assumed yield from average annual precipitation = 12% of total = 1.1"
 = 1.1" x 53.3 x 85 = 5,000 Acre Feet

5. Assumed yield from 100-yr. storm (U.S. Soil Conservation Service)
 85 x 100 = 8,500 Acre Feet

6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year

7. Length of watershed is approximately 12 Miles

8. Slope of watershed for lower areas averages 50' per mile

9. Slope of watershed for upper areas average 500' per mile

DATA ON
BUCKEYE WATERSHED DIVERSION PROJECT
WAGNER DIVERSION

1. Drainage Area 45 sq. miles
2. Average annual precipitation 9.3 inches
 Buckeye (58-yr. record - 7.5")
 Wickenburg (50-yr. record - 11.9")
 The average of the precipitation at the above two stations will be used since their higher elevation more nearly approximates the conditions for the drainage area.
3. Assumed precipitation from a 100-yr. storm (U.S. Soil Conservation Service) 5.0 inches
4. Assumed yield from average annual precipitation: 12% of total - 1.1" = 2,600 Acre Feet
 $1.1" \times 53.3 \times 45 =$
5. Assumed yield from 100-yr. storm (U.S. Soil Conservation Service) 4,500 Acre Feet
 45×100
6. Evaporation loss in this area, based on recorded losses in similar areas in Arizona is 8 Feet/year
7. Length of watershed is approximately 16 Miles
8. Slope of watershed for lower areas averages 50' per mile
9. Slope of watershed for upper areas averages 50' per mile

January 16, 1961

CONFLUENCE OF HASSAYAMPA AND GILA RIVERS

Project "H"

This project would consist of the clearing of vegetation from the channels of the Hassayampa River and the construction of adequate channels and dikes to permit free flow of waters. This work should extend from the confluence of the two rivers upstream, northerly, a distance of approximately seven miles to a point approximately four miles northerly from the Southern Pacific Railroad bridge crossing the Hassayampa River.

The clearing and channelization of the Gila River has been covered by a report made by the Corps of Engineers in December of 1957. In this report the clearing and channelization of the Gila River between McDowell Dam Site to Gillespie Dam was recommended by the Corps.

For the channelization of the Hassayampa River to function properly, the channelization of the Gila River from the mouth of the Hassayampa River to Gillespie Dam must also be accomplished. As explained in the discussion of Project "G", the condition of the river channels as they now exist retards the flow of waters in these channels and causes back water to flow over the farm lands and also cause irrigation canal levees to break.

Damages caused by floods and benefits derived from the proposed improvements are described in Project "G" and will not be duplicated here.

The Corps of Engineers in their report of December 1957, recommended a channel width of 2,000 feet between Gillespie Dam and Phoenix.

The proposed width of the improved channel for the Hassayampa River is 400 feet.

PRELIMINARY ESTIMATE OF COST

1. Clearing and Channelizing the Hassayampa River - 7 miles @ \$50,000 per mile	\$ <u>350,000</u>
Total Estimated Cost	\$ 350,000

PRELIMINARY ESTIMATE OF BENEFITS

1. As described in Project "G" Annual from Project "G"	\$ <u>132,400</u>
TOTAL	\$ 132,400

ESTIMATED COST TO COMPLETE STUDY

1. Consulting Engineer, further damage and benefit study, preliminary design, maps and plans, conferences	\$ 350
2. Soils investigation	\$ 300
3. Reproduction, reports	\$ <u>100</u>
TOTAL	\$ 750

Have You Suffered Flood Damages? If So, Town Wants Cost Figures

If the flood control problem which has plagued the Town of Wickenburg for many years is to be solved, says Town Manager Reuben Stifel, it will be necessary to furnish the Maricopa County Flood Control District with a detailed accounting of flood damage here in past years. And this accounting must be made within the next few days.

For that reason, town officials issue an appeal to all residents of the town and those owning property surrounding

the town to write to the town manager at once giving information as to flood damage on their properties. In accounting damage, residents are asked to itemize incidents of flood damages over as many years as they can. They are also asked to include items of expense spent on flood protection such as the building of retaining walls.

It is also requested by the town officials that these damage reports be turned in to the town manager as quickly as possible.

1960 Was Second Driest Year In 20

During the past 20 years, 1951 with 18.62 inches of rainfall was the wettest year and 1956 with 3.59 inches was the driest. Last year, 1960, was the second driest in 20 years with only 5.72 inches.

Here is that 20-year rainfall record:

Year	Inches
1940	10.58
1941	18.31
1942	6.71
1943	11.48
1944	14.48
1945	10.34
1946	10.97
1947	6.40
1948	8.56
1949	14.18
1950	6.04
1951	18.62
1952	15.88
1953	7.90
1954	11.49
1955	10.18
1956	3.59
1957	8.68
1958	8.87
1959	13.02
1960	5.72

WICKENBURG, ARIZ., SUN
Fri., Jan. 6, 1961 Page 7

Reports On Damages By Flood Are Needed

If the Town of Wickenburg is to achieve its goal of adequate flood control measures, it must have detailed reports of flood damages within the week.

A second appeal to residents of the town and surrounding area is issued by Town Manager Reuben Stifel to supply such reports in writing to Town Hall. Property owners are asked to report damages over as many years as they can remember. They are asked to include actual damages during floods and also money spent in flood control work such as the building of retaining walls and the dredging of ditches.

This information will be compiled here for the Maricopa County Flood Control District.

December 31, 1960

Dear Mr. Stifel,

The following is the report of flood damage & prevention on our property from the 2 flash floods of August 1959. We moved into the house at 82 N. Grant in April 1958 so that is the only time we have been flooded. There were 2 previous floods of about equal proportions prior to that time & since this house was built.

We have built a retaining wall (137 ft. long, 3 ft. high & 6 inches thick) worth about - \$1,500.00

Loss of annual 80.00

Loss of 8 gasoline cans 15.00

Loss of 2 palm trees 3.00

In addition items of small value such as an old garbage can were lost. Rocks, sand & silt were deposited on the lawn & some mite eroded across the property - necessitating cleanup & leveling.

Sincerely,

Mrs. Warren Kelly
P. O. Box 1232

268 Garcia St.
Jan. 5, 1961

Dear Mr. Stifle my property is located on 268 Garcia St. near the Sals wash. years ago it used to be a dove house on a lot next to my property, and now it all wash out, now my property it only 12 feet from the wash. I would like to know if some day it going to be something done about this so I can improve my house.

Yours truly

Joe T. Ocampo

Jan. 6 - 1961.

Report on damage by flood.

Late in the summer of 1955 the people of Sticksburg experiencing a more prolonged flood condition which undermined a concrete block wall or rather one half of a wall 190 ft. long which we found necessary to build several years earlier to protect our two houses on the corner lot at ^{North} Jackson and what was then called 4th St. I think it is called Mohave St. now. I estimated the loss to be more than \$163. Then I hired Homer Rose to build a concrete wall at a cost of \$600 after the flood subsided that was during the summer of 1955. I sold the property in May 1956
(over)

to Kenneth Duncan. So far as
I know the wall has held so
far.

Mrs. Golda Metcalf
147 W. Yavapai St
Tucson
Ariz.



RICHARDS' SHOP
Cabinet Making - Carpentry
P. O. BOX 1102 - WICKENBURG, ARIZONA

2 Jan 1961 -

Mr R. Stiefel
Town Manager
Wickenburg, Ariz.

Dear Sir -

Attached is a statement of
flood damage sustained by
us during the last five years.
Our property - residence + business
is located on Burden Ave at
Constellation Road - across from
the El Recreo South -

Phone MU. 4-2496



RICHARDS' SHOP
Cabinet Making - Carpentry
P. O. BOX 1102 - WICKENBURG, ARIZONA

Water damage to household &
furnishings - 150.00
Loss of clothing + luggage - 200.00
Impairment of tools +
equipment, + resulting in loss
of income - 500.00
Damage to outside of Bldgs - 150.00
1,000.00
Complete destruction of business
records, legal papers + documents,
cannot, of course, be estimated -

Very truly yours -
Joy F. Richards

Dec 26, 1960

Mr Rubin Steifel,
Town Manager
Wickenburg, Ariz.

In reference to your ad in
the paper about flood damage in
Wickenburg.

My residence is at 331 West
Center Street. In the past six years
I have spent about \$500. building
a retaining wall to help protect
my property.

Although I have never suffered
any severe damage to my house
there is always the constant threat
of what a real serious flood could
do to this entire area of
the town. Also I have to keep
after the area around my
retaining wall as it has had a
tendency to wash under my
wall at times.

Sincerely,
Bob Fodhill

P.O. Box 332
Wickenburg, Ariz

Town Manager
Wickenburg, Ariz.

Dear Sir;

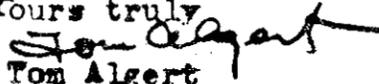
In relation to the notice in the paper to advise you of flood damages, We paid Ketch Billingsley \$330 to build up some land north of Blakeleys -

It still erodes away a little with each storm and will have to be done again-

The two washes that the town cant put up with indefinitely are: the one ~~that~~ back of Blakeleys and the one just north of the Mormon church.

There is a wildfowl conservation angle also. Last spring, ducks landed in several swimming pools for lack of other water. I have bought a duck stamp every year and would like to see some of the money used to build dams where the two above mentioned washes originate.

Yours truly


Tom Algert

December 29, 1960

Mr. Ruben Stifel, City Manager,
Town of Wickenburg,
Wickenburg, Arizona

Dear Mr. Stifel;

We have owned the property at 444 Constellation Road for approximately 1½ years. In 1959 we had flood damage, from the summer rains, which caused the Powder House Wash to flow so heavily that flood waters came onto our property. It caused damage to the garage, tools and building supplies stored there. It left debris, sand and silt over the entire property which took much time and effort to clean up. Some fill dirt had to be hauled in to replace that which had been washed away on the street and wash side. Since this time I have had the expense of a deep foundation cement block wall, reinforced with steel, fence and heavy solid bottom metal gates, plus fill dirt to raise the land level 16" at the front of the property, on the wash side.

Both neighbors on each side of us have gone to considerable expense for masonry flood walls joining our property. Mr. R. W. Williams had considerable damage to his garage, tools and building materials stored within, plus the cleaning of debris, sand and silt left on his property in 1959.

Here are the estimated damages in cost and preventative flood measures taken by both Mr. Williams and myself.

Estimated flood damage in 1959 for Mr. and Mrs. Ben Crayne,
444 Constellation Road:

Flood damage-----	\$450
Flood control-----	425 (expense of masonry flood walls)

Estimated flood damage in 1959 for R. W. Williams at
456 Constellation Road:

Flood damage-----	\$ 600
Flood control-----	1,000

Very truly yours,

Ben Crayne



Remuda Ranch

WICKENBURG, ARIZONA

January 3, 1961

Mr. Rubin Stifel
Town Manager
Wickenburg, Arizona

Dear Rubin:

We wish to have our estimate of flood damage considered in your report to the state on flood control for this area. Since this has been a yearly thing for our 36 years here, we have not kept accurate figures so you will have to accept these estimates as approximate but accurate to the best of our knowledge.

Annual road repair -- (Approach road from ranch to town-- 1 mile in length)	\$300.00
Road Repair around ranch--	100.00
Repair road wash damage from exceptional storms (about every 2 years)	200.00
Damage to service roads around ranch	100.00
Fence repair from washing (wages)	105.00
Fence repair (equipment & supplies)	25.00
Repair of drainage ditches and irrigation ditches and pipes	200.00
Removal of downed trees caused by erosion of root structure	50.00
Replacement of ranch flora destroyed by flooding	50.00
Building cleaning and repair (wages)	45.00

Other expenses are --

Extreme inconvenience when Powderhouse road is washed out-- this can be very serious when we have many guests as it prevents delivery of food and the transportation of guest to and from the ranch. This also works against us in that we are trying to sell off several pieces of property which would be adversely affected by flood damage and road closure. River flood over our two farm areas can be really disastrous. We have about 140 acres on the river which we are developing into irrigated pasture. One area was flooded and a large deposit of sand left which stopped all use of the pasture area. We will now have to remove this deposit for land use-- cost unknown, but should run into about \$1000.00. When this project is in operation (1962) any flood damage will be extremely costly to us requiring new dikes and removal of sand deposits. Costs of grading and clearing have varied over the years, but by the same token some years have seen floods of excessive damage requiring extensive repairs --we will estimate our expenses for flood damage repair over the 36 year period at about \$35,000. Give or take a few thousand.

"WAKE UP TO SUNSHINE"

Dana Burden

DESERT CYPRESS TRAILER RANCH

SHADE

RECREATION

MODERN CONNECTIONS

PHONE 2447
BOX 236

HEER AND FAYE CAMERON
OWNERS

REMUDA AND
CONSTELLATION ROADS

WICKENBURG, ARIZONA

December 29, 1960

Mr. Ruben Stifel, City Manager,
Town of Wickenburg,
Wickenburg, Arizona

Dear Mr. Stifel:

Attached hereto is the estimated cost of flood damage and flood control expense for the seven years we have owned this property.

The flood damage cost is estimated because no actual was kept at the time, except for the pumping of the septic tanks. These tanks have always filled with water in the event of a flood.

I believe the 5% loss of income is too conservative. I know you have heard the "horror stories" about the terrible floods in this area. I know of many people that have located elsewhere because of these rumors.

There was no flood damage in 1960 because we did not get the late summer rains. The flood in 1959 caused the most damage. It is appropriate to point out that a flood a few years prior to the time we bought this property, caused considerable damage to this property and did an estimated \$30,000.00 in damage to nearby El Recreo Court.

My neighbors on Remuda and Constellation roads have all suffered flood damage and have spent considerable money on flood prevention. The annual threat of summer flood is a terrible thing. Three different times I have rescued Mrs. Mary Shoeltes, an elderly woman, from her home when her property was inundated.

The costs, as shown, do not include the expense to the Town and the Fire Department in the pumping of water and building and repair of levees and roads. I sincerely hope a dam can be built at Powder House Wash to contain the flood water and alleviate the present condition.

Very truly yours,
Heer Cameron
Heer Cameron

ESTIMATED FLOOD DAMAGE- DESERT CYPRESS TRAILER RANCH
 REMUDA AND CONSTELLATION ROADS
 WICKENBURG, ARIZONA

	Flood Damage	Expenses for Flood Control	Loss of Income
1954	\$ 500.00		
1955	700.00		
1956	1,200.00		
1957	1,200.00	\$ 680.00 Expense for 356 ft. 12 in. storm sewer	
1958	1,000.00	260.00 Expense for earthen flood wall.	5% of \$ 24,000.00
1959	1,600.00	175.00 Rip rap flood wall.	
1960	-----	950.00 Expense of building masonry flood walls.	
	<u>\$ 6,200.00</u>	<u>\$ 2,065.00</u>	<u>\$ 4,200.00</u>
		TOTAL	\$ 12,465.00

Flood damage includes damage by water; clean up of lawns and cleaning out all buildings; grading and repairing roads.

Flood control covers the actual cost of construction of flood prevention projects.

Loss of income is based on a conservative 5% of the income of the court for the seven years in question.

Flood Damage 431 Constellation Rd.
in 1959 flood. Can not estimate
in dollars - but debris + gravel
was dumped in the back yard
higher than the foundation
of the house - Water under
the house damaged ^{some} floor
boards, cracked walls - a
couple inches or more of silt
was ⁱⁿ ~~in~~ garage floor

the water here was higher
and many things were damaged
including a refrigerator. It was
months before we could get
it moved (the debris + gravel).
Finally Mr. Herb Cameron had
some one come in with
machinery and take most of
it out. ~~Most of~~ All of it is out,

The lot on the east of us. The
tons of debris & gravel moved
can be estimated from that.

We built a \$300 retaining wall
which couldn't possibly turn
back such a flood as that one
but hope it will hold back
any we may have in the
future.

C. E. Philbeck

Cooke Brothers
BUILDING CONTRACTORS
WICKENBURG, ARIZONA

Jan. 10, 1961

Common Council
Town of Wickenburg, Ariz.

Gentlemen:

I wish to report the following damage & expense caused by flood water in the brach of the wash that empties into Sol's Wash at our office & shop lot, 3 W. Caveness.

We have lost nearly a third of our 130' x 141' lot to erosion by this wash; we spent \$388.00 to have the lot filled in an effort to prevent further erosion & contributed another \$60.00 in a neighborhood effort to riprap the bank with brush, cable & automobile bodies. The entire program was split among 6 property holders here & amounted to some \$350.00. Since then we have spent over \$200.00 in wages to plant Tamarisk trees along the bank & irrigate them. We feel that this will protect against minor floods but with a volume of water such as came down the wash in 1955-56-57 this planting would not prevail.

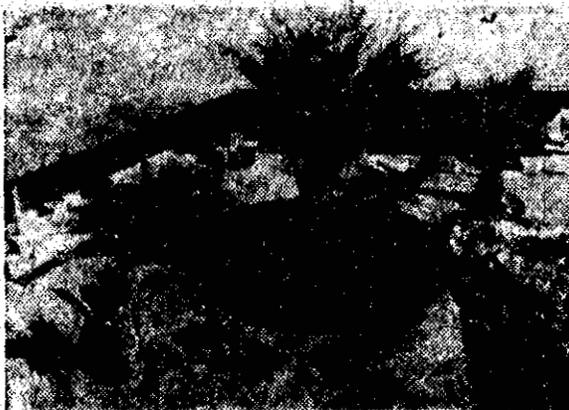
The above items, which do not include work by other property holders & loss of land to them, amounts to \$1438.00 & could have been prevented by the control of flood water in this branch of the wash, & will have to probably be done over again in case of a heavy flood in this wash.

Sincerely yours,

Harry D. Cooke, Jr.
Harry D. Cooke, Jr.

NEW
WELL-KEPT
COOLED BY
REFRIGERATION
BACK FROM HIGHWAY

KODACHROME LECTURES
BY
BILL BASS
COLOR PHOTOGRAPHER



RESTFUL PATIO
"PHOTOGRAPHERS HANGOUT"

La Siesta Motel



APPROVED

ON HIGHWAYS
60-70—COAST TO COAST

AND

93-89—CANADA TO MEXICO

WICKENBURG, ARIZONA

P. O. BOX 865



PHONE MU 4-2191

January 9, 1961

Ruben Stifel, Town Manager
Town Hall
Wickenburg, Arizona

Dear Mr. Stifel:

In regard to your request for a report of flood damages I wish to report that several years ago the floods down Powderhouse Wash cost me at least \$5,000.00 in damages to my residence and property. Since that time, nearly every year, I have had some damages to the back of my residence which faces El Recreo Drive.

The flood waters back up into my garage and in some instances past the garage to the back door of my house and washes away my garbage cans. This is a constant worry and expense to me every year.

Also the flood damage to the alley back of my house is quite extensive every year and causes a lot of inconvenience.

Most sincerely yours,

W. G. Bass

WGB/em

Wickenburg Arizona

Jan 10 - 1961

Dear Sir: -

In reply to your request for information in regard to property damage in this area by flood water.

We acquired this property in Dec. 1943. Since that time we have had our fences washed out many times and had to replace same we have had to hire men to haul dirt to fill in large holes that were washed in our yard also clean up trash left on the lawn all of which cost money over a period of several years I think it amounted to about \$300⁰⁰ eventually I had to build a wall in front of our place to keep the water out

later I had to build it higher as it now stands there is about 165 ft in front and 140 ft down on side this cost was about \$400⁰⁰ more plus my labor and I think this is a very conservative figure

Signed

Jack Harris