

Appendix 3: Russian River Water Project

Key to the development of Sonoma County and Cloverdale was an adequate source of drinking water and protection from floods. The Cloverdale City Council and the Cloverdale Chamber of Commerce were both interested in the Russian River as a source of water and recreation. Dave Davini took a leadership role in assuring support to build the Coyote Dam and other projects that protected the city's water rights and gave the city a strong voice in development of the river.

- A. 1948 Proposed Plan for Improvement of Flood Control and Allied Purposes on Russian River. The first Russian River comprehensive plan to control the flows of the river and provide for future agricultural irrigation and municipal water supplies was developed in 1947 and 1948. Dave Davini took a keen interest in seeing the plan move forward, and he helped build cooperation among regional governmental agencies to make financing possible for suggested projects.
- B. 1954 Control and Use of Russian River Water. The second comprehensive plan for the Control and Use of Russian River Water was developed by the Sonoma County Flood Control and Water Conservation District in 1953 and 1954. Dave Davini worked to assure that this plan moved forward and that the City of Cloverdale was well represented. Water is still a critical issue with all cities in Sonoma County, but without early involvement of people like Dave Davini smaller cities would be far less well served.
- C. 1959 Invitation Letter to Dedication Day Ceremonies. On June 6, 1959, Dave Davini was invited to the Dedication Day Ceremonies for Lake Mendocino and the Coyote Dam in honor of his many years of service to Russian River development.

RUSSIAN RIVER, CALIFORNIA

DESCRIPTION OF THE
PROPOSED PLAN OF IMPROVEMENT
FOR FLOOD CONTROL AND ALLIED PURPOSES

February 1948

WAR DEPARTMENT
CORPS OF ENGINEERS
OFFICE OF THE DISTRICT ENGINEER
SAN FRANCISCO DISTRICT
74 NEW MONTGOMERY
SAN FRANCISCO, CALIFORNIA

March 4, 1948

Mr. V. M. Moir
Manager, North Coast District
California State Chamber of Commerce
Rosenberg Building
Santa Rosa, California

Re: File No. PSNVG

Dear Sir:

Reference is made to the letter from this office, dated 9 October 1947, transmitting a brochure describing the proposed plan of improvement for the Russian River for flood control and allied purposes.

As you know, the plan described in the original brochure has been revised in accordance with recommendations by higher authority. The principal revisions are the addition of a comprehensive plan for ultimate development, and the arrangement for construction of the entire plan in two or more stages.

A copy of the revised brochure is inclosed. It should be emphasized that the plans are still subject to further review and revision by higher authority.

Please feel free to request any further information you may require.

Very truly yours

S. N. KARRICK
Colonel, Corps of Engineers
District Engineer

1 Incl
Copy of Revised Brochure

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RUSSIAN RIVER, CALIFORNIA
PROPOSED PLAN OF IMPROVEMENT
FOR FLOOD CONTROL AND RELATED PURPOSES

A. INTRODUCTION

1. Description of the watershed. The Russian River watershed, or "drainage basin," as it is sometimes called, comprises an area of 1,485 square miles in the Coast Range Mountains of California. It extends 81 miles along its north-south axis and 32 miles along its widest east-west dimension. The northern boundary is 16 miles north of Ukiah, Mendocino County, and the southern boundary is 9 miles south of Santa Rosa, Sonoma County. The population today is estimated at 65,000 persons, most of whom reside in or near the rich, agricultural valleys situated along the river and its principal tributaries. Agriculture is the principal industry of the area. The favorable combination of mild climate and scenic surroundings forms an important recreational resource, the value of which is indicated by the fact that the watershed receives a million recreational visitor-days each year.

2. Floods and related water problems. Like other California streams, the Russian River is subject to flooding during the winter rainy season. The floods vary in magnitude from year to year, but some damage occurs almost every year. The seriousness of the flood problem may be appreciated when it is realized that future floods on the Russian River will, unless protective measures are taken, cause damages estimated at an average of more than \$600,000 per year. Over a 50-year period the damage would amount to a total of more than \$30,000,000. Damage from the flood of February 1940 alone, when evaluated at present-day values and prices, amounted to nearly \$3,000,000. In that flood, the bulk of the losses resulted from damage to agricultural land and improvements, crops, residential and commercial property, railways, highways, streets and bridges and from interruption of traffic and loss of labor opportunity. Thus, it is seen that practically all groups in the area are affected adversely by the floods.

3. In addition to floods in the winter, the Russian River is subject to frequently recurring low flows in the summer and early fall months, particularly in the lower reaches of the river. Were it not for the diversion of Eel River water into the Russian River through the power house at Potter Valley, the Russian River would be practically dry in many years. As it is, the water is stored behind Scott Dam on the Eel River and released through the Potter Valley Power House at an average rate of about 190 cubic feet per second (c.f.s.). The Potter Valley Irrigation District uses a portion of this water under a contract with the power company which enables the district to divert water from the tailrace of the power house at rates of flow up to 50 c.f.s. The remainder of the water flows into the Russian River and serves rich agricultural valleys and important recreational areas throughout the length of the river. The

importance of the Eel River water to the Russian River drainage basin cannot be overestimated. Since the beginning of the full diversion in 1922, the use of water for irrigation in the Russian River basin has developed at a steady rate. Many farmers in all of the important agricultural areas along the river now pump water directly from the stream or from wells in gravel beds fed by the stream. The expanding trend in irrigation development is evidenced by the fact that the Potter Valley Irrigation District, which serves its users by gravity flow, has recently applied for a new contract to increase its maximum use from 50 c.f.s. to 100 c.f.s.

4. The increasing trend toward irrigation in the Russian River basin, if it continues, will eventually bring about a water shortage, particularly along the lower reaches of the river. The water shortage will be particularly detrimental to the recreational areas, but may also prevent important agricultural areas below the Ukiah Valley from reaching full development of their potential productivity under irrigation.

5. It is expected that the City of Santa Rosa, the Santa Rosa Plains, the Petaluma area and the northwest portion of the San Francisco Bay area will eventually look to the Russian River for their principal source of water supply for agricultural, domestic and industrial uses.

6. History of development of flood-control plans. Far-sighted residents in the Russian River basin began agitating for a solution to their water problems in the early 1930's. Their efforts began to bear fruit in 1937, when the 75th Congress, in Public Law 406, authorized and directed a preliminary examination and survey of the Russian River for flood control. The investigation was assigned to the San Francisco District Engineer, Corps of Engineers. The preliminary examination, the objective of which is to determine whether a complete survey is warranted, resulted in a favorable recommendation by the District Engineer in May 1939. Accordingly, a survey was ordered by the Chief of Engineers in June 1939, and the District Engineer submitted a survey report in January 1941. The Board of Engineers for Rivers and Harbors, which must review all such reports, was not convinced of the advisability of the United States undertaking at that time the improvements recommended in the District Engineer's Report, and issued an unfavorable public notice to that effect in June 1941.

7. In July 1944, local interests in the Russian River basin requested that the study of the Russian River be reopened in order that consideration might be given to changes and developments which had taken place since the submission of the 1941 survey report. In December 1944 the Congress amended the Flood Control Acts to provide, in effect, that survey reports for flood control should include full consideration of all related water uses, such as recreation, irrigation, domestic and industrial water supplies, power development and conservation of fish and wildlife, as well as flood control. After the end of World War II the San Francisco District Engineer initiated the present comprehensive survey, which has considered flood control and all related water uses. This survey has resulted in the formulation of the multi-purpose plan of improvement described below.

B. COMPREHENSIVE PLAN FOR ULTIMATE DEVELOPMENT

8. Potential water resources. The full potentialities of the water resources of the Russian River greatly exceed the needs which now exist or may be expected to develop in the reasonably foreseeable future. The comprehensive plan described below will provide: substantial control of damaging floods; conservation sufficient for recreational, fish and wildlife requirements; irrigation, domestic and industrial water supply within the basin; and a considerable surplus of water for export to neighboring communities. Despite the apparent adequacy of this comprehensive plan, it is entirely possible that within the economic life of these features further developments within the drainage basin or in neighboring communities may warrant the construction of still other flood-control, water-conservation or power elements.

9. The Comprehensive Plan. The present comprehensive plan for flood control and allied purposes in the Russian River basin consists of the following units:

a. Channel-stabilization works along the Russian River.

b. A reservoir on the East Fork of Russian River at Coyote Valley, with a gross storage capacity of 199,000 acre-feet, of which 48,000 acre-feet would be reserved for flood control, 40,000 acre-feet for recreational and fish and wildlife requirements, 107,000 acre-feet for irrigation and domestic and industrial water supplies, and 4,000 acre-feet for siltation.

c. A reservoir on Dry Creek near Cloverdale, with a gross storage capacity of 216,000 acre-feet, of which 43,000 acre-feet would be reserved for flood control, 13,000 acre-feet for recreational and fish and wildlife requirements, 157,000 acre-feet for irrigation and domestic and industrial water supplies, and 3,000 acre-feet for siltation.

10. Expected accomplishments of the comprehensive plan. Construction of the comprehensive plan outlined above would decrease flood damages along the river by approximately 60 percent. Under present conditions of development in the areas subject to flooding, the complete elimination of all flood damages in the Russian River basin is not possible within economic limitations. The reservoir storage would be sufficient to provide for all foreseeable water needs in the Russian River basin, with a considerable quantity left over for possible export to other areas in need of water.

C. ELEMENTS OF COMPREHENSIVE PLAN TO BE DEFERRED AT THIS TIME

11. Elements to be deferred. There are certain features of the comprehensive plan which will have to be deferred until the demand for them has developed sufficiently to warrant their construction. These features are irrigation on the Santa Rosa Plains and water supplies for areas outside the Russian River basin. Although the flood-control feature of Dry Creek Reservoir is needed now, its construction by the Federal Government cannot be economically justified

unless it is incorporated in a multiple-purpose reservoir of considerably greater size than would be required for flood control alone. Moreover, since the Dry Creek Dam site is not suitable for two-stage construction, it is essential that, when a dam is constructed at the site, the resulting reservoir capacity must be sufficient to develop the maximum potentialities of the watershed above the dam. The construction of Dry Creek Reservoir, therefore, will be deferred until the demand for irrigation on the Santa Rosa Plains is more fully developed. Coyote Valley Dam site is suitable for two-stage construction. Accordingly, Coyote Valley Reservoir will be constructed initially to a storage capacity of only 122,000 acre-feet to provide for immediate needs; enlargement to the ultimate capacity of 199,000 acre-feet will be deferred until there is a demand for water supplies in areas outside the Russian River basin.

D. PROJECTS PROPOSED FOR IMMEDIATE CONSTRUCTION

12. Projects proposed for immediate construction. The following projects, which are elements of the comprehensive plan described above, are recommended for immediate construction:

a. Channel-stabilization works along the Russian River, at an estimated first cost of \$900,000, and an estimated annual cost of \$14,500 for maintenance and operation.

b. A reservoir of 122,000 acre-feet capacity on the East Fork of Russian River at Coyote Valley, at an estimated first cost of \$16,000,000, and an estimated annual cost of \$18,000 for maintenance and operation.

13. Channel-stabilization works. The channel-stabilization works include channel clearing, bank protection and channel training. The objective in constructing these works will be to increase the capacity of the river channel, to lessen bank erosion and to prevent undesirable channel changes. The success of the channel-stabilization works will be dependent upon a carefully considered program of annual maintenance. This maintenance program will be a responsibility of local interests.

14. Coyote Valley Reservoir. The reservoir on the East Fork of Russian River at Coyote Valley will be impounded by an earth dam constructed to a height of 151 feet above the present stream bed. The total crest length of the dam will be 4,390 feet. A concrete spillway with a crest length of 410 feet will be constructed on the right abutment of the dam (looking downstream). The gross storage capacity in the reservoir will be 122,000 acre-feet, of which 48,000 acre-feet will be reserved for flood control, 3,700 acre-feet for siltation and the remainder for other beneficial water uses. The acquisition of about 2,500 acres of land will be required for Coyote Valley Reservoir. The estimated cost of acquiring this land, at present market values, has been included in the total estimated cost of the reservoir. When the water surface is at the elevation of the spillway crest, it will form a lake approximately $3\frac{1}{2}$ miles long and 1,900 acres in area. During the season from April through October the lake will have an average area of 1,500 acres. The dam will be

constructed with provision made for raising it at some future date to the height required for the ultimate reservoir capacity of 199,000 acre-feet.

15. Results and benefits of the projects proposed for immediate construction. The following results are expected to be achieved by construction of the channel-stabilization works and Coyote Valley Reservoir.

a. Flood Control. The operation of the reservoir and the channel-stabilization works will decrease flood damages along the Russian River by approximately 45 percent. The greatest degree of flood protection will be afforded the areas that are immediately downstream from the reservoir.

b. Recreation. During the recreation season, the water stored in Coyote Valley Reservoir will be released so as to maintain a flow of at least 200 c.f.s. in the recreational areas at all times. For those areas along the river the releases from the reservoir will be sufficient to take care of all other water needs, such as irrigation and municipal supplies for towns bordering the river and the City of Santa Rosa, in addition to maintaining the specified flow of 200 c.f.s. in the recreational areas. This will permit the recreational areas to expand to their optimum development. With California's steadily increasing population, the Russian River, given an adequate water supply, may be expected to become an even more important recreational center than it is today.

c. Irrigation. The present pattern of irrigation use in the Russian River basin indicates that irrigation generally begins in April, increases to a maximum in June and July, and stops by the end of September. Following is a tabulation of the lands actually irrigated in the Russian River basin over a period of years.

LAND ACTUALLY IRRIGATED

1910	1,000 acres
1920	3,400 acres
1930	6,200 acres
1940	10,200 acres
1944	16,900 acres

In recognition of this definite trend toward irrigation, the proposed reservoir at Coyote Valley has been designed with sufficient capacity to provide for the ultimate irrigation needs of all agricultural areas down stream from the reservoir and adjacent to the river. The principal areas in this provision are the Ukiah Valley, Hopland Valley, Cloverdale Valley, Alexander Valley, and those agricultural areas immediately adjacent to the river between Healdsburg and Mirabel Park. The dam has been designed to permit raising it at some future date to its maximum practicable height. The raising of Coyote Valley Dam and the construction of Dry Creek Reservoir will probably be undertaken when the demand for water on the Santa Rosa Plains, the Petaluma area and the northwest portion of the San Francisco Bay Area become urgent.

d. Municipal and industrial water supplies. Studies of population trends indicate that the Russian River basin will receive its share of California's expected population growth. Increased population means increased water demands for domestic and industrial uses. Although no special provision has been made at this time for municipal and industrial water supplies, the proposed plan could be used very readily to supply any municipality or industry located along the Russian River below Coyote Valley Reservoir site. Special provision for the municipalities is not necessary at this time because, in general, they will expand over lands which have already been allocated a water supply for irrigation. The use of such municipalities per acre is expected to be about the same as the use for irrigation.

e. Power. Careful study has been given to the possibility of installing a hydro-electric power development at Coyote Valley Dam. Because such an installation is not economically justifiable at power values which are expected to prevail during the foreseeable future, no provision has been made for power in the present plans. However, it is considered possible that the value of power might some day increase to the point where an installation at Coyote Valley Dam would be justified.

16. Costs. The total estimated cost of the projects proposed for immediate construction is \$16,900,000. Of this amount, \$6,400,000 are allocated to the Federal Government as non-reimbursable funds, including the entire estimated cost of construction of channel-stabilization works. Of the remaining costs, \$5,800,000 should be borne by recreational interests and \$4,700,000 by domestic, industrial and irrigation water users. The allocations of cost in the reservoir are derived by equitably sharing the savings gained by combining all interests in a multi-purpose reservoir instead of building separate reservoirs to accomplish the same results. The estimated annual cost of maintenance of the channel-stabilization works is allocated to local interests, in accordance with Federal law. The estimated annual cost of the reservoir is allocated in proportion to anticipated methods of operation and maintenance. The allocations of cost, based on December 1947 prices, are presented in the following tables.

FIRST COSTS

	<u>Non-Federal #</u>				<u>Total Cost</u>
	<u>Federal</u>	<u>Municipal Industrial</u>	<u>Irrigation Recreation</u>	<u>Total</u>	
Channel Stabilization	\$ 900,000	\$ 0	\$ 0	\$ 0	* \$ 900,000
Coyote Valley Reservoir	5,500,000	4,700,000	5,800,000	19,500,000	16,000,000
Total	\$6,400,000	\$4,700,000	\$5,800,000	\$19,500,000	\$16,900,000

See paragraph 10 below for possible methods of financing non-Federal costs.

* Local interests will be required to furnish all lands, easements and rights of way needed for the channel-stabilization works. At this time, it is anticipated that any costs to be incurred for this purpose will be nominal in amount.

ANNUAL COSTS FOR OPERATION AND MAINTENANCE

	Federal	Non-Federal #				Total Annual Cost
		Municipal	Industrial	Recreation	Flood Control	
		Irrigation				
Channel Stabilization	\$ 0	\$ 0	\$ 0	\$ 0	\$14,500	\$14,500
Coyote Valley Reservoir	11,000	3,100	3,900	0	7,000	18,000
Total	\$11,000	\$3,100	\$3,900	\$14,500	\$21,500	\$32,500

It should be emphasized that the above costs are based on December 1947 values and prices. They are considerably higher than they were a year before. Any appreciable increase or decrease in future construction costs generally will be reflected in the total estimated cost of the proposed project, and, consequently, the exact amounts to be allocated to the various interests will depend upon the actual cost of construction. Moreover, all of the above figures are still subject to review and revision. Therefore, no one should be surprised if the final cost allocations differ somewhat from those given above.

17. Requirements of local co-operation. It is expected that the District Engineer's report on Russian River, which is subject to review and revision by higher authority, will contain substantially the following recommendations:

a. The adoption of a comprehensive plan for flood control and allied purposes, including channel-stabilization works along the Russian River; a reservoir on the East Fork of Russian River at Coyote Valley, with a gross storage capacity of 199,000 acre-feet; and a reservoir on Dry Creek near Cloverdale, with a gross storage capacity of 216,000 acre-feet.

b. The construction at this time of Coyote Valley Reservoir to a storage capacity of 122,000 acre-feet, and channel stabilization works, at a total estimated first cost of \$16,900,000, and an estimated annual cost of \$32,500 for maintenance and operation, subject to the conditions that local interests:

(1) Establish a competent and properly constituted public body to be responsible for fulfilling the further requirements listed below.

(2) Hold and save the United States free from damages due to the construction works.

(3) Contribute, for the beneficial use of conservation storage, \$10,500,000 of the first cost of Coyote Valley Reservoir. (See paragraph 18 below for possible methods of financing.)

(4) Contribute \$7,000 annually as their share of the cost of maintenance and operation of Coyote Valley Reservoir.

(5) Adjust all claims concerning water rights arising from the improvements.

(6) Provide without cost to the United States all lands, easements and rights of way necessary for construction of the channel-stabilization works.

(7) Contribute the cost of all utility relocations necessitated by construction of the channel-stabilization works.

(8) Maintain and operate the channel-stabilization works after completion in accordance with the regulations to be prescribed by the Secretary of the Army.

18. Possible methods of financing. The contribution by local interests* of their share of the first cost of Coyote Valley Reservoir might be financed in any of several ways, among which are the following:

a. The entire amount could be contributed by local interests in cash before the start of construction.

b. The entire amount might be appropriated by the Congress for construction and repayed by local interests in annual installments, in accordance with the applicable Federal laws.

*The term "local interests" includes the State, Counties and other subdivisions of local government, as well as private groups and individuals.

19. Steps required to make the project an actuality. After the survey report has been completed by the Corps of Engineers, it will be transmitted to the Governor of the State and the Secretary of the Interior for their comments. Finally, the report will be transmitted by the Secretary of the Army to the Congress, where it will be published as a House Document. If it meets with the approval of the Congress, the recommended plan of improvement will become an authorized project. After the project has been authorized, construction may begin when the Congress appropriates the necessary funds.

20. It will be noted that the first requirement of local cooperation is that local interests must "establish a competent and properly constituted public body to be responsible for fulfilling the further requirements***." In effect, this means that local interests should form a flood-control and water-conservation district with its boundaries closely following the boundaries of the Russian River watershed. This body will then be responsible for cooperating financially with the United States and for taking over the local share of the maintenance of the project following completion of construction. This does not preclude the contribution of funds by the State and other subdivisions of local government.

FINANCIAL AND ECONOMIC REPORT

CONTROL AND USE OF RUSSIAN RIVER WATER

A Report on the Financial Feasibility of the
Proposed Coyote Valley Reservoir
and Utilization of Russian River Water in Sonoma County

PREPARED FOR THE
BOARD OF DIRECTORS
SONOMA COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

STONE & YOUNGBERG
Municipal Financing Consultants
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MEMBERS
SAN FRANCISCO STOCK EXCHANGE

MUNICIPAL FINANCING CONSULTANT DEPARTMENT

February 1, 1954

The Honorable Board of Directors
Sonoma County Flood Control and Water Conservation District
Santa Rosa, California

Gentlemen:

In accordance with the terms of our employment, we are submitting our report on the proposed Coyote Valley reservoir and systems for utilizing Russian River water in Sonoma County.

This report reviews the proposed reservoir project, estimates current and future demand for domestic water, and presents costs of systems to serve this demand from the Russian River. Present costs of domestic water production are estimated and compared with costs of Russian River water delivered to various communities. The ability of existing storage and diversion facilities on the Eel River to serve Sonoma County's needs is examined.

Present and future use of irrigation water is studied, flood control benefits of the project are analyzed, and the project's effect on recreation is considered. Russian River water rights are discussed, and methods are outlined for financing the local share of reservoir costs and the cost of a diversion and transmission system to serve areas south of the Russian River.

The major conclusions of this report are as follows:

1. No revenues from the sale of stored water can be relied upon to defray any costs of the Coyote Valley reservoir. The Sonoma County share of reservoir costs can be financed only by general obligation bonds of the District supported by a tax on all land and improvements in the District.
2. Quantities of water diverted from the Eel River to the Russian River have increased greatly since 1950. The Coyote Valley reservoir is not necessary to permit Santa Rosa and other domestic users to obtain their full supplies from the Russian River if these reasonably large

diversions continue. Certain other water needs in Sonoma County may also be satisfied from the Russian River if these diversions continue. An agreement between the District and the Pacific Gas & Electric Company to provide reasonably large minimum summer flows would be desirable.

3. Diversion and transmission works to deliver Russian River water to southern Sonoma County can be financed by the District if the City of Santa Rosa contracts to purchase minimum annual quantities of water from this system.

Agricultural, industrial, residential, and recreational development of Sonoma County may be stimulated by provision of additional water supply at Coyote Valley. Evaluation of these potential benefits and comparison with the District's share of the project costs are the tasks now confronting the Directors and residents of the District. We believe the facts and analyses presented in this report will permit sound evaluations, comparisons, and decisions to be made.

Our data and analyses are presented in detail in the body of this report. A chapter-by-chapter summary of the most important facts and conclusions is included at the beginning of the report.

We will be happy to meet with your Board and with the County Flood Control and Water Conservation Commission to discuss the contents of this report. If your Board decides to submit bond proposals to the electorate, we will furnish other services as provided for in our contract.

Respectfully submitted,

STONE & YOUNGBERG

J. C. Youngberg

REPORT SUMMARY

CHAPTER I - DESCRIPTION OF THE PROJECT

The Corps of Engineers, U.S. Army, proposes to build a dam at Coyote Valley in Mendocino County above Ukiah. The first stage of this reservoir, 122,000 ac. ft. capacity, which is discussed in this report, will cost an estimated \$16,250,000. Channel stabilization works costing an additional \$900,000 are included as part of the project.

Construction is contingent on certain non-Federal participation. Major item in this participation is a contribution, in cash prior to construction, of \$5,598,000.

The reservoir is designed to hold all upstream run off above the damsite during a 50-year flood (48,000 ac. ft.), maintain a minimum summer flow of 200 c. f. s. at Guerneville, and provide 24,000 ac. ft. annually for consumptive use downstream.

Water stored in the reservoir will be made available for consumptive use away from the river only if diversion works and transmission systems are constructed. These works are not included as part of the Federally sponsored project.

The major portion of the summer flow of the Russian River is diverted from the Eel River watershed by the Pacific Gas and Electric Co. at its Potter Valley power house. Average diversions have increased from 190 c. f. s. to more than 300 c. f. s. since the preparation of the Army Engineers report.

The Potter Valley Irrigation District has a contract with the P. G. & E. providing for certain diversions during the irrigation season. Other than this contract there appears to be no legal obligation on the part of the P. G. & E. to continue this diversion.

Sonoma County's participation in financing the Coyote Valley reservoir would be feasible and desirable if (a) revenues from sale of water were sufficient to pay the non-Federal costs, (b) benefits from the reservoir were sufficient to justify the District's assuming its portion of the cost as a general obligation, (c) the growth of the county as a result of the construction would produce enough benefits or revenues to justify present assumption of indebtedness, or some combination of the above.

CHAPTER II - OTHER STUDIES OF THE WATERSHED

Principal studies of the Russian River basin are reports of the District Engineer, U.S. Army, and related reports and appendixes; the Bureau of Reclamation, U.S. Department of Interior; the Soil Conservation Service, U.S. Department of Agriculture; Whipple Engineering Company, and John S. Cotton.

Basic engineering data upon which this Stone & Youngberg report is based were developed by Paul L. Nichols, Chief Engineer, Sonoma County Flood Control and Water Conservation District, and his staff.

CHAPTER III - DOMESTIC WATER USE

Santa Rosa is the largest Sonoma County domestic water user. The City Council and Board of Public Utilities have adopted resolutions agreeing to purchase 5000

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ac. ft. of treated water annually at \$47.80 per acre-foot or 6000 ac. ft. of raw water at \$31 per acre-foot. The City now has a well supply but desires to develop a reliable surface source if possible.

Sebastopol is a relatively small user and has recently invested in new wells. The City has made no agreement to purchase water from the Russian River if it were available.

Petaluma is served by the California Water Service Co. The company does not desire to retire its existing system in order to utilize Russian River water but would like the new source as a stand-by.

Sonoma Valley communities are served by the City of Sonoma and the privately owned Sonoma Water and Irrigation Company. The Sonoma State Home is also a large producer and user of domestic water.

There are no other population concentrations away from the river in Sonoma County large enough to justify their being considered for service from the Russian River system. Some communities may be located along major transmission lines, if constructed, and thus be able to obtain water.

Cities on the Russian River such as Cloverdale and Healdsburg cannot be considered as potential revenue customers of a new water distribution system.

A summary of present and estimated future demand in acre-feet for the four communities most likely to be served domestic water from the Russian River is as follows:

	1953	1960	1970	1980
Santa Rosa	4,330	5,600	8,400	11,300
Petaluma	1,560	1,860	2,420	2,950
Sebastopol	450	600	750	900
Sonoma Valley	710	1,400	2,000	2,600
Totals	7,050	9,460	13,570	17,750

Whether any of these communities can be considered as potential customers of the Russian River system is dependent on these factors: (a) Price which must be charged for Russian River water, (b) Present cost of local water production, and (c) Costs of producing additional supply other than from the Russian River.

CHAPTER IV - DIVERSION AND TRANSMISSION SYSTEMS

Domestic water can be delivered to communities in southern Sonoma County by either pipelines or canals. Diversions works can be either at Wohler Bridge (for pipeline) or near Healdsburg (for canal).

Pipeline construction costs to serve Santa Rosa, Petaluma, Sebastopol, and the Sonoma Valley from Wohler Bridge have been prepared. These are summarized below for various years of demand.

Cities Served	System Adequate for Year		
	1960	1970	1980
Santa Rosa only	\$3,411,000	\$4,421,900	\$ 4,946,500
Santa Rosa and Petaluma	5,765,000	6,747,700	7,804,700
Santa Rosa, Petaluma, and Sebastopol	6,144,600	7,344,500	8,188,100
Santa Rosa, Petaluma, Sebastopol and Sonoma	8,116,100	9,852,800	10,946,200

Unit costs per acre-foot of water delivered by the pipeline systems described above were computed by adding maintenance and operation costs to annual capital charges with interest at 3-1/2 per cent. Demand in each city was assumed as presented in Chapter III.

City	1960	1970	1980
Santa Rosa only	\$45.46	\$38.73	\$34.19
Santa Rosa	41.18	34.96	31.89
Petaluma	80.40	70.77	61.63
Santa Rosa	39.95	34.44	31.27
Petaluma	79.18	70.26	61.00
Sebastopol	54.23	45.48	40.01
Santa Rosa	37.01	32.24	29.95
Petaluma	76.39	68.24	59.99
Sebastopol	52.17	43.82	39.25
Sonoma	99.07	85.20	74.38

All of the unit costs presented above assume that the communities named will purchase their entire supplies from the Russian River system.

Costs of delivering water to Santa Rosa through a so-called Sotoyome canal were estimated. This canal was designed with 60 c. f. s. capacity, and provisions were made for delivery of 8000 ac. ft. of irrigation water annually along the canal route. The cost estimates for the canal and for the domestic facilities required to supply Santa Rosa are presented below.

Canal Cost	\$2,166,000
Domestic system costs:	
1960 capacity	\$1,625,300
1970	2,106,500
1980	2,619,000

Unit costs for domestic and irrigation water were estimated in two ways. Domestic costs were assumed to bear all costs except pumping of irrigation water, and domestic was assumed to carry all except pumping and the irrigation share of canal maintenance and administration and labor. The costs were estimated only for Santa Rosa. For other communities the incremental costs would be about the same as with the pipeline except that Sebastopol costs would be higher.

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Class of Water	Cost per Acre-Foot		
	1960	1970	1980
<u>Irrigation pays pumping only</u>			
Domestic (Santa Rosa)	\$48.12	\$37.82	\$32.63
Irrigation	1.50	1.50	1.50
<u>Irrigation shares pumping, maintenance, administration</u>			
Domestic (Santa Rosa)	\$46.32	\$36.82	\$32.00
Irrigation	2.76	2.55	2.39

CHAPTER V - PRESENT WATER PRODUCTION COSTS

Present water production costs were estimated for seven water utility systems in Sonoma County. This constitutes an estimate of the cost of that water which would be replaced if a Russian River system were to supply it instead. Distribution and commercial costs were, of course, not included.

Estimated water production costs per acre-foot for the seven systems studied are as follows:

Santa Rosa	\$21
Petaluma (Calif. Water Service Co.)	33
Healdsburg	16
Sebastopol	29
Sonoma City	32
Sonoma Water and Irrigation Co.	32
Citizens Utility Corp. (Guerneville)	33

With anticipated 1960 demand delivery of Russian River water to Santa Rosa would be slightly less expensive with pipeline than with canal. In 1970 and 1980 canal unit costs are lower than those with pipeline transmission. Lowest possible estimated cost is \$32 per ac. ft., with 1980 domestic demand and 8000 ac. ft. of irrigation water sold.

Costs of delivering Russian River water to communities other than Santa Rosa are too high to permit favorable comparison with existing production costs. In most cases costs of delivery to all these communities are more than twice present local production costs.

Costs of delivering domestic water to southern Sonoma County are so high that no revenues can be obtained to assist in paying the costs of the Coyote Valley reservoir. Paying the costs of diversion, transmission, and purification will be difficult even without adding any portion of the reservoir costs.

CHAPTER VI - ALTERNATIVE PRICING METHODS

Three pricing systems have been considered for delivery of water to the four communities discussed above: Santa Rosa, Petaluma, Sebastopol, and Sonoma. These systems are in addition to the "cost" method of Chapter IV and are as follows:

1. Uniform pricing: all water sold in all communities at the same price.

2. Uniform sharing of capital charges: only price differences among community customers would be the different maintenance and operation charges at the different cities.

3. Incremental cost pricing: Santa Rosa pays the same price regardless of how many other customers are served. Each other city pays only the incremental costs of its being served.

All three schedules listed above would result in higher prices for Santa Rosa and generally lower prices elsewhere. Schedule 3 appears the most equitable and the one likely to get the greatest popular support if it is desired to reduce the prices away from Santa Rosa.

CHAPTER VII - ALTERNATE SOURCES OF WATER

Expansion of Santa Rosa's present underground supply may prove difficult due primarily to opposition of other well owners. City officials doubt that underground production can be increased very much above its present output.

The policy of the Santa Rosa Board of Public Utilities is expressed in a statement included in this chapter.

Elsewhere in the county there has been less investigation of domestic water resources. Sebastopol and Petaluma appear to have some reserve capacity although that in the latter system may be small.

According to the Bureau of Reclamation, large scale irrigation from wells on the Santa Rosa Plains is not possible except near the Laguna de Santa Rosa. Wells now being used have low capacity, and pumping costs are high.

The U. S. Geological Survey is now conducting a detailed study of ground water in the county. When this report is available, it will provide basic facts on which water supply decisions can be based. The report probably will state that the underground supply replenishes slowly but does replenish from year to year and that large quantities at great depths are difficult to obtain.

CHAPTER VIII - ADEQUACY OF EXISTING FLOWS

Santa Rosa's present domestic demand can be satisfied in the maximum month by a continuous diversion of ten c. f. s. during the month.

The P. G. & E. has 93,700 ac. ft. of storage capacity available for diversion to the Russian River at up to 345 c. f. s. Recent interconnection of generating systems makes diversions of water by P. G. & E. less dependent on power demand in the immediate service area than was formerly the case.

The maximum discharge from the Potter Valley power house, 345 c. f. s., apparently can supply Santa Rosa's domestic needs, irrigate 8000 acres, and maintain a flow of 200 c. f. s at Guerneville.

Lake Pillsbury's capacity, 93,700 ac. ft., is sufficient to operate the diversion works at capacity for 122 days and at a rate sufficient to maintain the required minimum 200 c. f. s. flow at Guerneville for an additional 45 days even if no other water were to enter the Eel or Russian River.

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Lake Pillsbury has filled in all except five seasons since 1923 and has had more than 80,000 ac. ft. in storage on June 1 in all but three seasons. Only twice since 1930 have the minimum annual contents been less than 20,000 ac. ft.

The driest year of record was 1924. During a similarly dry year with present storage and diversion facilities, the recreation flow would have to be reduced. With an increase in diversions for irrigation, some conflict among users would exist in such a dry year. The Coyote Valley reservoir would eliminate this conflict.

Santa Rosa is not dependent on the Coyote Valley reservoir in order to obtain domestic water from the Russian River. This fact is an additional reason why no revenues applicable to the reservoir's cost can be obtained from sale of domestic water.

The Sonoma County District should make every effort make sure that existing facilities for storage in the Russian River system are being used as effectively as possible. A contract with the P. G. & E. to provide for reasonably high minimum summer flows is one method for improving utilization of available water.

Russian River watershed development may be hindered by fear that the P. G. & E. will discontinue its diversion or that, even with a contract for diversions, too little water will be available in Lake Pillsbury in dry years. If this is so, Coyote Valley reservoir is one method for eliminating these possible obstacles to growth.

CHAPTER IX - IRRIGATION IN SONOMA COUNTY

Most detailed data on irrigation in Sonoma County are found in the 1950 Census of Agriculture. Studies of irrigation in parts of the county have been made since by the Soil Conservation Service, the Division of Water Resources, and the County Agricultural Commissioner.

Sonoma County now has relatively little irrigated agriculture compared with the rest of California. Average size of irrigated farms is smaller than the state average.

Irrigators are highly dependent on ground water and individual wells. Two-thirds of the irrigators used only ground water and three-quarters of all irrigated land was served at least in part by ground water, according to census data.

With improved water supply Sonoma County's development can be expected to be similar to that of Santa Clara County. Surface water will have to be used instead of ground water, however.

Hop acreage has declined sharply in recent years. Largest increases in the use of irrigation water have been for permanent pasture.

Recent increases in applications for appropriation of water indicate increasing use of Russian River water for irrigation.

CHAPTER X - PRESENT AND POTENTIAL DEMAND FOR IRRIGATION

Farm organizations have not been active in support of the Coyote Valley reservoir project or in seeking means of making more irrigation water available. Several factors are responsible for this.

Diversions from the Eel River have increased since 1950 and there has been adequate flow available for all riparian owners who wish to use water for irrigation.

Estimates of the Army Engineers place the unit costs of irrigation water in what they believe are the best areas of the county at about \$13 per acre and more than \$7 per acre-foot. This does not include any payment toward the costs of the Coyote Valley reservoir or other storage on the river.

Irrigation of the Santa Rosa Plains was not contemplated by the Army Engineers or consulting engineers. If, however, a canal is constructed to deliver domestic supplies to Santa Rosa, irrigation water can be sold on the Plains at reasonably low cost.

A high value crop pattern must be assumed for most areas to be irrigated under the Army Engineers' plan. This plan is based primarily on pears, hops, and truck gardens. The Bureau of Reclamation believes irrigation of existing prune and apple orchards would not repay irrigation costs.

The Santa Rosa Plains are assumed to use irrigation water primarily on pasture and some row crops.

Residential desirability of Sonoma County farm land is an important factor affecting the prices which can be paid for irrigation water. Such lands can afford to pay more than can lands whose only value is agriculture.

Soils in Potter Valley are better than those in most parts of Sonoma County, but costs of irrigation in Sonoma County would generally be higher than in Potter Valley. Residential desirability of Sonoma County is much greater, however.

CHAPTER XI - ACTION REQUIRED BY IRRIGATORS

Some doubt now exists as to the desire of potential irrigators to put Coyote Valley water to beneficial use if it becomes available.

Potential irrigators can demonstrate their desire for additional water by forming districts for the purpose of constructing and operating distribution systems.

The Santa Rosa Plains can be irrigated at relatively low cost if a canal is built for Santa Rosa domestic supply. A pipeline can also be used for domestic transmission, but the canal is preferable if there is clearly demonstrated desire for water by potential irrigators on the Plains.

The District Directors can either delay action on financing their share of the Coyote Valley reservoir until assurance is received that the water will be used, or they can proceed now and then encourage expansion of irrigation, possibly by subsidizing the distribution system.

CHAPTER XII - FLOOD CONTROL

According to the Army Engineers, flood control is the principal purpose of this project.

The major flood control benefits of the reservoir will accrue to Mendocino County. Sonoma County will benefit primarily from the construction of channel stabilization works. Annual benefits of the project, 1950-2000, are estimated by

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the Army Engineers to average \$341,000, of which \$166,700 accrues to Sonoma County. With present development the benefit to Sonoma County is estimated at \$124,400 annually.

The Federal government considers it should assume the full costs of flood control features of the project. The several purposes of the reservoir are inseparable, however, and flood control benefits must be considered fully in deciding upon local participation in the project financing.

A special benefited zone could be set up by the District Directors to assume a share of the flood control costs of the project. Such a zone would be very difficult to designate, and the spreading of costs within the zone would also be difficult. The complications involved probably outweigh the benefits of establishing such a special assessment district.

CHAPTER XIII - IMPORTANCE OF RECREATION

According to the Army Engineers, the costs of providing recreation storage exceed either the flood control or irrigation supply storage costs. The Army Engineers assign \$3,090,000 of the non-Federal share of \$5,598,000 to recreation.

The Army Engineers also estimate that 50.6 per cent of all project benefits accrue to recreation.

The physical and legal positions of the downstream recreational areas are weak in comparison to those of other users. Increased irrigation use along the Russian River will produce conflict between irrigation and recreation. Recreation would be left with less water as the needs of higher purpose users increase.

The annual income from tourists in the principal recreation areas of Sonoma County is estimated at \$7 million and \$11 million by the California State Chamber of Commerce and the Russian River Region, Inc. Income from the tourist industry is of very great importance to Sonoma County because it is earned outside but spent inside the county. The benefits of these expenditures extend throughout the county.

Sonoma County would serve its best interests by protecting and stimulating development of its recreational assets.

Some important benefits to fishing may result from a program for maintaining a minimum river flow during the fall months. In combination with other programs of the Department of Fish and Game, maintenance of flow in the fall may make the Russian River very attractive to anglers. The effect of these programs is, however, difficult to predict accurately.

CHAPTER XIV - PROJECT BENEFITS TO RECREATION

Assignment of monetary values to recreation is extremely difficult. Based on studies of the National Park Service, the Army Engineers estimate the benefits to recreation of maintaining a minimum flow of 200 c. f. s. at \$857,000 annually.

The Army Engineers' study of 1941 and the Bureau of Reclamation report of 1945 both evaluated the same benefits as are embodied in the current proposal. They estimated annual benefits at \$156,000.

The Bureau of the Budget took exception to the method employed by the Army Engineers in evaluating recreation benefits and suggested that the "worth of the additional water per acre-foot" be used. The most conservative figure which can be obtained from the Army Engineers' figures is \$15.80 per acre-foot used for recreation.

Absence of the dam will have less serious consequences than anticipated by the Army Engineers since the diversions from the Eel River have increased since their report was prepared and there are no announced plans for large increases in upstream diversions for agricultural or domestic use.

The minimum flow which can be permitted in the recreational area has not been determined. Although the Army Engineers proposed 200 c. f. s., two consulting engineers have recommended 125 and 100 c. f. s. as reasonable minimums.

CHAPTER XV - ASSESSMENT FOR RECREATION BENEFITS

Recreation interests constitute important direct beneficiaries of the proposed project and should bear directly a portion of the County's share of reservoir construction costs.

Zones can be formed within the District by resolution of the Directors, and a 25¢ assessment can be levied without a vote in the zone. Only a protest of owners of a majority of the assessed valuation of real property can halt zone formation.

Three zones have been considered as representing the primary recreational property in the area from Mirabel Park to Jenner: (1) Six school districts which from the river, (2) These six districts plus two others dependent on recreation, and (3) A zone to be based primarily on four existing recreation districts.

The assessed valuation of taxable property in these proposed zones is \$8.8 million, \$9.9 million, and \$6 million. The 25-cent levy would produce from \$15,000 to nearly \$25,000 annually. The smallest of the three zones might approve a larger assessment.

The Fitch Mountain area does not benefit to the same extent as that downstream. A zone here seems appropriate, however, if one is to be organized downstream. Only about \$2000 annually should be raised here.

CHAPTER XVI - RUSSIAN RIVER WATER RIGHTS

Most of the Russian River's summer flow is diverted from another watershed. Therefore, users of this water must do so under permit or license issued by the State Division of Water Resources.

Beneficial use creates water rights. Permits or licenses do not in themselves constitute water rights.

The State Department of Finance has filed applications for direct diversion and storage in anticipation of Coyote Valley reservoir construction. No water rights problems are anticipated if the reservoir is constructed.

There is now more water flowing in the river at some times than applications have been filed for. Sonoma County uses this water beneficially for recreation and should have a permit for this use.

Recreation is a beneficial use but not a high order use. Any permit issued for this use would be subject to subsequent applications for higher use (domestic, irrigation).

If the Sonoma County District contemplates diversion of Russian River water for domestic and irrigation use, applications should be filed for these uses.

Concurrent applications with Mendocino County would be desirable where both Counties or Districts are to divert for the same use. Otherwise, the position of the upstream county is so strong that no action taken by Sonoma County can be injurious to Mendocino's interests.

Filing of applications for diversions and use of foreign water for recreation is particularly important if the Sonoma County District contemplates contracting with the P. G. & E. for increased diversions from the Eel River.

CHAPTER XVII - FINANCING THE RESERVOIR

Since there will be no revenues available to defray any part of the local share of construction costs, the only way the Sonoma County District can finance its share of project costs is by general obligation bonds. The District as a whole can incur indebtedness if approved by a two-thirds vote of the electorate. Principal and interest on the indebtedness are paid from a tax on all taxable real property in the District.

Zones of benefit, as prescribed in the original 1949 Act, appear unsound. Exclusion of any part of the County from taxation for the project is very difficult.

Establishment of a recreation zone and levy of an annual assessment in the zone will reduce the amount required to be raised by taxation in the remainder of the District.

Several methods have been proposed for division of non-Federal costs between Sonoma and Mendocino Counties. Under the various methods Sonoma County's share ranges from 73.5 per cent to 88.7 per cent. The final decision as to the share to be borne by each county must be made by negotiation between the two District Boards of Directors.

The tax rate which must be levied in Sonoma County to repay indebtedness incurred for the reservoir is affected by several factors: the interest rate and term of the bonds, the assessed valuation of taxable real property, the distribution of indebtedness between two counties, and the contribution in Sonoma County to be made by directly benefited zones.

With interest at 3-1/2 per cent and equal annual payments of principal and interest for forty years, the required tax rate would be 21.8¢ per \$100 assessed valuation of real property if Sonoma County were to repay the entire indebtedness. This required rate would be reduced to 16.4¢ if Mendocino County assumed 25 per cent of the reservoir cost. These two rates would be reduced to 20.2¢ and 14.7¢ respectively if a \$20,000 annual contribution were made by a recreation zone in Sonoma County. The rate would be reduced as District assessed values increase.

If the courts rule that exemptions do not apply on property subject to this tax, the required tax rate would be six per cent lower.

CHAPTER XVIII - FINANCING A DOMESTIC TRANSMISSION SYSTEM

Delivery of domestic water from the Russian River to Santa Rosa may be feasible due to the City's expressed willingness to pay a high price for water in order to develop a surface supply. Service to cities other than Santa Rosa does not appear to be economically feasible at this time.

The City of Santa Rosa can construct a system to deliver Russian River water to the city. District construction and operation would be preferable if irrigation water were to be delivered en route. District operation would also facilitate extension of the system to other cities and would provide a method for allocating water among conflicting users in the event of low flows in the river.

In order for the District to construct a transmission system without a county-wide subsidy, it must have a firm long-term contract with the City of Santa Rosa for minimum annual water purchases.

General obligation bonds are the best method for financing the transmission system. If the District were to seek to finance a transmission system with revenue bonds, the unit costs of water to be sold would have to be higher than with general obligation bonds. If a suitable price cannot be offered by the District to the City, the City can construct its own facilities.

The District can sell raw or treated water to Santa Rosa, and either entity can construct the treatment works. Irrigation water can be sold if a canal is constructed, but the price can be high enough only to cover maintenance and operation.

CHAPTER XIX - PRESENT OR FUTURE ACTION

Sonoma County has been growing steadily and the trend seems certain to continue. This growth may be stimulated greatly by provision of additional water supply at Coyote Valley.

Prompt affirmative action by local interests on the reservoir project is necessary if the Congress is to appropriate construction funds in its 1954 session. The authorization of the project contains no specific time limitation, however, and it is reasonable to assume that the reservoir can be constructed at a future date on the same terms.

Construction of diversion and transmission works is independent of the reservoir, and action may be taken at any time on the initiative of the District.

The arguments against the reservoir project are based on the proposition that it is not needed now. The arguments in favor assume that present provision of a firm water supply would result in great future development of the county.



DEDICATION DAY CEREMONIES

Lake Mendocino + Coyote Dam

SPONSORED BY THE CALIFORNIA COUNTIES OF SONOMA AND MENDOCINO

Saturday, June 6, 1959

LEIGH SHOEMAKER
Chairman Sonoma County
Board of Supervisors

May 15, 1959

JOSEPH HARTLEY
Chairman Mendocino County
Board of Supervisors

HERBERT COCHRANE
Chairman Russian River
Flood Control and Water
Conservation Improvement Dist.

Mr. Dave Davini
Cloverdale
California

BEN A. COBER
Publisher Ukiah Daily Journal
General Chairman

Dear Mr. Davini:

COORDINATING OFFICES

ROBERT V. MOIR
Manager North Coast Dist.
Calif. State Chamber of Commerce
319 Rosenberg Building
Santa Rosa, California
Telephone Liberty 5-2474

You are cordially invited to attend the Dedicatory Exercises at the Coyote Valley Dam on Saturday, June 6, 1959. As one who has made this project possible, we are looking forward to seeing you before and during the ceremonies which officially take place from 2:00 p.m. to 3:00 p.m.

C. PAUL SUTTERLEY
Manager Ukiah and Mendocino
County Chambers of Commerce
105 North Main Street
Ukiah, California
Telephone HOmestead 2-3091

There will be aquatic sports during the morning, a band concert in the picnic area from noon until 2:00 p.m. (food will be available) and the official dedication will start at 2:00 p.m. at the same location.

The traffic committee has arranged for automobiles to turn east on OLD STATE HIGHWAY ROUTE 20 past the U. S. ENGINEERS ADMINISTRATIVE HEADQUARTERS and then travel across the crest of the dam to the observation point and picnic area.

We hope you can attend all the events which start officially at 11:00 a.m.

Very truly yours,



BEN C. COBER
General Chairman

