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BRIDGE CANYON PROJECT

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Mr. MCFARLAND, from the Committee on Interior and Insular Affairs, submitted the following

REPORT

[To accompany S. 75]

The Committee on Interior and Insular Affairs, to whom was referred the bill (S. 75) to authorize the construction, operation, and maintenance of a dam and incidental works in the main stream of the Colorado River at Bridge Canyon, together with certain appurtenant dams and canals, and for other purposes, having considered the same, report favorably thereon with amendments, and with the recommendation that the bill, as amended, do pass.

GENERAL STATEMENT

The bill, S. 75, authorizes the construction of a multipurpose project known as the Bridge Canyon project, which includes a dam and other works on the Colorado River in northwestern Arizona, works in central Arizona, and a dam and works in New Mexico. The primary purposes are to provide urgently needed irrigation water for more than 725,000 acres in Arizona and New Mexico; and to furnish an installed capacity of approximately 770,100 kilowatts of power needed for domestic, commercial, and pumping purposes.

The project recommended by this bill, which has been approved by the Department of the Interior, has been exhaustively studied by the committee during 15 days of testimony in the Eightieth Congress on a predecessor and a related bill (S. 1175 and S. J. Res. 145) and 20 additional days in this Congress. In all, more than a hundred witnesses were heard and the printed records comprise several thousand pages of testimony, tables, charts, and diagrams.

Those hearings prove beyond question that the project here authorized is not only one of the most important reclamation programs in the entire United States but that the economy of much of the State of Arizona is largely dependent upon its completion. Thousands of farmers live on the 725,000 acres in Arizona which would

receive irrigation water from the project; additional thousands of families, merchants, suppliers, bankers, and workers on these farms are directly dependent for their very existence on the continued production of these areas. The area will revert to desert if additional water is not soon made available.

The committee is also impressed with the fact, brought out at the hearings, that not only is there at present a serious shortage of electrical power in the entire lower basin area—Utah, New Mexico, Arizona, Nevada, and California—but that the demand for electrical energy will continue to grow far beyond present means of supply. It is clear that the industrial economy of these five States will be severely impaired and retarded if additional hydroelectric energy is not quickly developed.

There exists a dispute between two States, Arizona and California, as to the right to use Colorado River water. While it is clear that both States have rights to the use of the water, witnesses representing Nevada and California questioned the right of Arizona to use Colorado River water for the project here recommended.

The committee is firmly of the opinion that regardless of the contesting claims of the States which have rights to Colorado River water that the project here recommended should be authorized and the bill, S. 75, be passed. The committee has, therefore, adopted an amendment which preserves the rights of the contesting parties by permitting a suit to be brought within 6 months from the date of enactment of this bill, which suit would judicially determine the rights of the parties. The amendment provides that the Government of the United States may be made a party to that suit. Moreover, the amendment fully protects the rights of the States involved by the prohibition of expenditures during such period and the pendency of such litigation for works which are required solely for diverting, transporting, and delivering water from the main stream of the Colorado River for use in Arizona.

A second amendment was also adopted by the committee which would eliminate from the project the construction of a dam, designed for silt control, on the San Juan River at what is known as the Bluff site. Construction of the Bluff Dam was, in the committee's opinion, made unnecessary in view of abundant evidence before it that the entire problem of silt control for the over-all project herein authorized would be fully and adequately solved by the construction of a dam at the Glen Canyon site, a project strongly favored by the Colorado River Basin States, and on which a report is being prepared by the Bureau of Reclamation for consideration by the committee. The Glen Canyon project is described in The Colorado River, a 300-page comprehensive report on the development of water resources by the Bureau of Reclamation. The Bureau's factual analysis of the value of constructing the Glen Canyon Dam is explained on page 146 of that report.

The Glen Canyon Dam, in the opinion of the committee, should and will be authorized and constructed at an early date as a separate and distinct project, not alone for silt control, but is essential in the development of the river for two additional primary reasons:

(*a*) To provide for the regulation of the flow of the Colorado River which would enable the upper basin States to meet their obligation under the Colorado River compact to deliver 75,000,000 acre-feet of water to the lower basin States every 10 years; and

(*b*) To help meet the acute power shortage in that area.

The amendment herein adopted reduces the over-all cost of the Bridge Canyon project by $29,628,000, thus bringing the total cost down to $708,780,000 of which approximately $658,096,000 is reimbursable. Such a reduction will aid water users and others who must meet repayment costs.

A third amendment, recommended by the Department of the Interior, was also adopted which gives the Secretary of the Interior somewhat greater discretion in settling the rights of Indians which may be affected by the construction of the project.

The committee also desires to call attention to the fact that a resolution is now pending before it, Senate Joint Resolution 4, which would give consent to a suit in the Supreme Court to settle the conflicting claims to use of Colorado River water. The committee feels that these claims do not constitute a justiciable issue at this time. The purpose of the resolution is accomplished by the committee's amendment to the bill, S. 75, while at the same time authority is given to undertake the project so urgently necessary. A substantial part of the project here recommended is not in dispute by any party; and construction of that part should not be affected or halted by the claims of contesting parties, the committee believes.

The committee is of the opinion that to delay the construction of nondisputed features of this project would be tragic for those thousands of citizens who are dependent for their future livelihood on its early completion. There is no dispute from any witness that the benefits of the noncontested features of the project are vitally needed and should be constructed. In recommending the passage of this bill, the committee has provided an opportunity for the judicial determination of conflicting claims but at the same time is authorizing the beginning of construction on a project which is essential to the economic welfare of a substantial portion of the United States.

A more detailed consideration of the features of the bill follows:

SCOPE

S. 75 authorizes works and facilities for the delivery of Colorado River water to the area embraced in the central Arizona project and to generate hydroelectric energy, the principal features of which are as follows:

(*a*) A dam and incidental works (including a generating plant) at Bridge Canyon on the Colorado River above Lake Mead in northwestern Arizona. The dam would be 315 feet high above the bed of the Colorado River, at an elevation of not less than 1,877 feet above sea level.

(*b*) A related system of main conduits and canals for the transportation of water to the project area, including a tunnel and main canal from the reservoir above the dam at Bridge Canyon to the Salt River above Granite Reef Dam; a canal from the Salt River to the Gila River above the town of Florence, Ariz.; thence a canal to Picacho Reservoir; and thence a canal to the flood plains of the Santa Cruz River.

(*c*) A dam at the Hooker site in New Mexico, and such other dams, canals, and other works as may be necessary for the transportation of water and the effectuation of exchanges of water between the users in the lower regions of the Salt and Gila Rivers and the users

on the higher elevations of such rivers which cannot be reached by a gravity flow of the Colorado River. These exchanges would permit the supply of Colorado River water to lower lands now receiving water from the Salt and Gila Rivers and their respective tributaries, thereby releasing the demands upon such latter waters in the lower areas and making the released water available for use on the higher lands.

(*d*) Complete plants, transmission lines, and incidental structures suitable for the fullest economic development and delivery of electric energy generated from water at the works to be constructed under the bill, both for use in the operation of the project and for sale in accordance with Federal reclamation law.

The construction of a tunnel and that portion of the main canal from the reservoir above the dam at Bridge Canyon to a point of junction with an aqueduct provided for in this bill, would be specifically deferred until Congress expressly determines that such construction is justified by economic conditions. The bill authorizes an aqueduct for the transportation of water from Lake Havasu above Parker Dam to the main canal, and incidental pumping plants required to raise water from the lake to flow by gravity through the aqueduct. The pumping plants and the aqueduct would constitute an adequate interim means for the diversion of water and would be appropriate supplemental and stand-by works after construction of the tunnel.

PURPOSE

The main purposes of the project are briefly summarized as follows:

(*a*) To supply supplemental water for the central Arizona project and for lands now being irrigated from the Gila River in New Mexico. In describing this phase of the project, the regional director of the third region of the Bureau of Reclamation, in his report to the Bureau (p. 118, H. Doc. No. 136, 81st Cong., 1st sess., central Arizona project) said:

> It has been shown previously that the central Arizona project is essentially a "rescue" project designed to eliminate the threat of a serious disruption of the area's economy.

(*b*) To provide a great new source of hydroelectric power to supply the rapidly expanding economy of the area and the tremendously increasing demand for electric energy. The Bureau of Reclamation (p. 181, H. Doc. No. 136) states that the most conservative forecast indicates that present total energy requirements would be doubled by about 1966. The Federal Power Commission, in a survey made by it based on data available through 1946, declares that energy requirements would be doubled by 1958.

(*c*) To furnish other substantial benefits such as flood and erosion control, advantageous exchanges and conservation of water, augmented supplies of water for municipal purposes, fish and wildlife conservation, and recreation.

A portion of the costs of the project, corresponding to over-all public benefits, is nonreimbursable. However, a much larger portion of the cost is reimbursable, the details of which will be noted below (p. 8). The committee points out that as to such reimbursable costs, the project will be a self-supporting and financially solvent undertaking. A related feature lies in the circumstance that part of the power generated

at the Bridge Canyon plant will operate the pumps required to lift the water from Lake Havasu; and the balance of that power, about two-thirds of the total output, will be available for commercial sale.

The central Arizona project consists of approximately 725,000 acres, which are located about as follows: 445,000 acres in Maricopa County, 200,000 acres in Pinal County, and 40,000 acres in Graham and Greenlee Counties. The report of the Bureau of Reclamation was thorough and complete as to the need for a supplemental supply of water for these lands. This report was fully corroborated to the satisfaction of the committee by testimony during the hearings on S. 75 and its predecessor, S. 1175.

Two examples pointing up the need for additional water may be cited. The Salt River Valley Water Users Association project, comprising 242,000 acres in Maricopa County, is the largest and oldest project in Arizona and has had the most adequate water supply. That supply consists of waters stored in the Roosevelt Dam and three other dams on the Salt River and two dams on the Verde River with a total capacity of approximately 2,000,000 acre-feet and a supplemental water supply secured by pumping from underground water. Storage capacity is sufficient, yet water supply has been adequate in only two of the last 25 years. It has fallen as low (in 1947) as 2 acre-feet per acre. But the Bureau of Reclamation estimates that the minimum per acre requirement to produce crops under proper irrigation practices is 4 acre-feet at the farmer's headgate.

The second example of severe deficiency of water is afforded by the San Carlos irrigation and drainage district, which comprises 100,000 acres of land irrigated in part by pumped water and in part by water flowing by gravity from the Coolidge Reservoir on the Gila River. The San Carlos district is the second largest of the subdivisions of the central Arizona project, and half of the district lands is owned by the Pima Indians who with their forebears are the pioneer irrigators of Arizona. In 1947 there was only one-fourth enough water for the San Carlos district. Supplemental water will not only rescue these lands, but will afford a solution to one of Arizona's problems with its Indian residents.

Other Arizona lands have a similar or even more inadequate supply of water.

Witnesses testified that if the water from this project is not made available, a minimum of 226,000 acres will be relegated to unproductivity. On the other hand, upward of 725,000 acres of developed land will receive essential supplemental water from the project.

However, in the committee's opinion, benefits to be received from the development of the project cannot be measured merely by the number of acres which will have to go back to the desert if the project is not authorized. The testimony showed that the economy of the whole State depends largely upon irrigation. It was testified by witnesses that from 150,000 to 250,000 people would have to seek new homes if the economy of the State is not saved by this project. Banking institutions, stores, and other businesses now both serving and depending upon these people would be seriously affected by these lands going out of productivity, which would result in the loss of homes and work for this large number of people.

The Bureau of Reclamation estimates that 1,200,000 acre-feet of water must be annually diverted from the Colorado River for use in

the project area in order to save this economy. Allowing for adequate outflow, the net annual depletion of the Colorado River would be 1,077,000 acre-feet of water.

NEED

There is no question that Arizona needs a great quantity of water to maintain her economy. Witnesses representing California acknowledged the existence of Arizona's need but merely questioned the extent of water necessary to meet such need. The Bureau of Reclamation, in condensing various of its conclusions regarding the project referred to the need (p. 191, H. Doc. No. 136, 81st Cong.) in this language:

> Unless additional irrigation water is made available to the project area, the equivalent of a 30-percent reduction in the presently cultivated lands in the area must eventually be effected. The central Arizona project is needed to sustain the existing agricultural economy of the area.
>
> * * * * * * *
>
> Substantially all surface water resources in the project area are controlled and utilized. Pumping from the ground-water basins in the area has increased progressively until the draft is about double the recharge. The only adequate source of supplemental water is the Colorado River.

In the above-noted report of the regional director appears the following language (p. 114, H. Doc. No. 136):

> In spite of the developments now available, there is an acute water shortage in the project area. The 1940–44 average annual surface water supply was 1,676,600 acre-feet. This figure includes some reuse of surface water. To supplement the surface water supply an average of 1,163,000 acre-feet annually was pumped from the ground-water basin during the same period. This pumpage is estimated to be about 468,000 acre-feet in excess of the safe annual yield of the underlying ground-water basins. Obviously continued pumping at the present rate will lower the water table to such a point that many of the wells will become dry. The wells on the edge of the water basin could not be rehabilitated by deepening because the perimeter of the water-bearing strata will be constricted as this process continues.

There is unanimity as to the need for additional electric energy in this area. The situation is well summarized by excerpts taken respectively from the report of the regional director and the report of the Bureau of Reclamation:

> There is an urgent and measurable need for additional electrical energy in Arizona, southern California, southern Utah, and southern Nevada. Studies by the Federal Power Commission, power distributing agencies, and the Bureau of Reclamation indicate that the present power load in this area, already taxing existing facilities, will double in the next 10 or 15 years. The major potential sources of electrical energy to serve these requirements are hydroelectric developments on the Colorado River and steam or Diesel developments. Steam and Diesel generating power plants consume natural gas, oil, or coal. Diminishing natural gas and oil supplies in southern California have already caused major concern. There are no sources of inexpensive coal available to the power-market area. These natural resources should be conserved by utilizing hydro power whenever practicable (p. 115, H. Doc. No. 136).
>
> An examination of the marketing possibilities in the lower basin power-market area for energy produced by the potential power developments of the central Arizona project indicates that an ample market would exist for the output of these plants when they are completed. As previously noted, the rapidly expanding economy of the area has created a tremendous demand for electric energy. This condition, combined with the drought of recent years and the lag in the installation of new generating facilities during the war, has caused a power shortage in the area. This shortage is particularly acute in Arizona and seems likely to continue for some time. Generating equipment planned for installation in the near future will eliminate most of the deficiency, but large-scale additions to the system will be needed to continue meeting the rapidly growing load.
>
> The two most important factors causing the rapid increase in total energy requirements have been industrial expansion and population increase. During

the war the growth in these phases of the economic life was very rapid. In the postwar period the growth has continued, with the result that total energy requirements in the area are greater than during the last year of the war. The States of Nevada, California, and Arizona are among the States experiencing the greatest percentage increase in population during recent years. Both Arizona and California have recorded gains exceeding 25 percent. Postwar building construction and industrial expansion in the urban areas of southern California has been unprecedented in the market area. The metropolitan area of Los Angeles is now rated as the second largest manufacturing center in the Nation.

TABLE E–8.—*Summary of power features*

Power plants	Installed capacity in kilowatts	Gross average power head in feet	Annual firm energy at plant in million kilowatt-hours		
			Initial conditions	Average during first 50 years of operation	Ultimate conditions
Bridge Canyon	750,000	612	4,675	4,395	4,114
Horseshoe	10,000	141	40	40	40
McDowell	4,100	54	23	21	19
Buttes	6,000	144	35	35	35
Total	770,100		4,773	4,491	4,208
Energy replacement at Stewart Mountain			25	28	31
Total			4,748	4,463	4,177
Energy requirements Havasu and McDowell pumping plants			1,154	1,393	1,633
Firm commercial energy			3,594	3,070	2,544

In addition to the growth in population and industry, several other fields of activity have contributed to the increased demand for electric energy. Among these are agricultural expansion and new industrial uses. Increased irrigation pumping, added farm use, and the use of electrometallurgical processes in the mineral industry have all caused an increase in the total requirements. Residential use of electricity has greatly increased in recent years not only because of the increased population but also because of the trend of increased per capita use (pp. 180–181, H. Doc. No. 136).

The demand for electric energy in Arizona, southern California, and southern Nevada is increasing at an estimated rate of 1,000,000,000 kilowatt-hours annually. The area is looking to the Colorado River for energy to meet that increasing demand, and to forestall the requirements for burning oil and natural gas reserves in meeting those demands (p. 191, H. Doc. No. 136).

Witnesses testifying on Arizona's need declared that there would be a demand in that State for all of the electricity generated in the project by the time it is completed, and introduced as evidence an application by the Arizona Power Authority for the acquisition of all such electricity. The purchase by Arizona's citizens of the hydroelectric output of the project combined with the payment by Arizona water users for water delivered to them would result in the complete repayment of the reimbursable portions of the costs of the project, plus routine maintenance and operation expenditures.

The regional director briefly summarizes the remaining needs in this language:

> In addition to furnishing the project area with a much-needed water supply, the potential central Arizona project would provide for silt retention, flood control, river regulation, municipal water supply, recreation, salinity control, and fish and wildlife propagation (p. 118, H. Doc. 136).

COSTS

The costs of the project were estimated on factors prevalent July 1, 1947. Upon that basis, such costs may be broken down as follows:

	Total
Coconino Dam and Reservoir	$7, 487, 000
Bridge Canyon Dam and Reservoir	191, 939, 000
Bridge Canyon power plant	73, 419, 000
Havasu pumping plants	25, 973, 000
Granite Reef aqueduct	131, 716, 000
McDowell pumping plant and canal	3, 346, 000
McDowell Dam and Reservoir	16, 326, 000
McDowell power plant	1, 012, 000
Horseshoe Dam (enlargement) and Reservoir	7, 078, 000
Horseshoe power plant	2, 628, 000
Salt-Gila aqueduct	34, 585, 000
Buttes Dam and Reservoir	29, 037, 000
Buttes power plant	1, 159, 000
Charleston Dam and Reservoir	9, 270, 000
Tuscon aqueduct	6, 401, 000
Safford Valley improvements	4, 090, 000
Hooker Dam and Reservoir	15, 484, 000
Irrigation distribution system	54, 086, 000
Drainage system for salinity control	9, 973, 000
Power transmission system	83, 771, 000
Total	708, 780, 000

The committee desires to emphasize that the original project embraced a dam and reservoir at the Bluff site in Utah. These particular works were eliminated by the committee, and the corresponding cost ($29,628,000) has been subtracted from the originally estimated total of $738,408,000. The details of this procedure are set forth hereinafter in the treatment of amendments (pp. 12-16).

The allocations of these costs to the beneficial purposes which will be achieved is therefore estimated thus:

	Amount
Power	$243, 798, 000
Irrigation	397, 693, 000
Municipal	16, 605, 000
Flood control [1]	6, 641, 000
Fish and wildlife [1]	3, 129, 000
Silt control [1]	28, 097, 000
Recreation [1]	37, 459, 000
Salinity control [1]	4, 986, 000
Total	738, 408, 000

[1] Nonreimbursable items.

This total must be reduced by $29,628,000 due to elimination of the dam and reservoir at Bluff, as above indicated.

AVAILABILITY OF WATER

While reasonably accurate computations are made and used in planning reclamation projects, the determination of the physical quantity of water flowing during a given period of time in a particular river is by no means an exact science. In this project the question of availability of water involves mixed considerations of law and fact.

The Bureau of Reclamation, however, has studied the problem closely and submitted the following table of water availability in consonance with interpretations by Arizona. These computations were supported by witnesses who testified in behalf of S. 75. This

table, which follows, appears at page 151 of House Document No. 136:

[Acre-feet a year]

Division between upper and lower basins and Mexico:		
Virgin flow of Colorado River at international boundary		17, 720, 000
Apportioned to the upper basin by art. III (a) of Colorado River compact	7, 500, 000	
Apportioned to lower basin by art. III (a) and (b) of Colorado River compact	8, 500, 000	
Allocated to Mexico by terms of Mexican treaty	1, 500, 000	
Subtotal		17, 500, 000
Total surplus to be allocated under the terms of art. III (f) of Colorado River compact		220, 000
Water available to Arizona:		
Apportioned to lower basin under art. III (a) and (b)		8, 500, 000
Apportioned water for California under Limitations Act	4, 400, 000	
Nevada contract	300, 000	
Lower basin uses by New Mexico and Utah	130, 000	
Subtotal		4, 830, 000
Remainder		3, 670, 000
To be allocated to Arizona under art. III (f) of the compact		55, 000
Available to Arizona		3, 725, 000
Disposition of water available to Arizona:		
Present irrigation depletions:		
Little Colorado River Basin	59, 000	
Virgin River and Kanab Creek Basins	5, 000	
Williams River Basin	3, 000	
Gila River Basin	1, 135, 000	
Colorado River Indian Reservation	15, 000	
Gila project	34, 000	
Yuma project	157, 000	
Subtotal		1, 408, 000
Losses from reservoirs on or benefiting main-stem developments of Colorado River present and future:		
Estimated total losses 900,000 acre-feet a year Arizona charged with proportion based on ultimate use of main stream Colorado River water		313, 000
Increased depletion by potential projects:		
Snowflake project	10, 000	
Hurricane project	12, 000	
Hassayampa project	20, 000	
Colorado River Indian Reservation	285, 000	
Gila project	566, 000	
Central Arizona project	1, 077, 000	
Unassigned water	34, 000	
Subtotal		2, 004, 000
Total, all uses		3, 725, 000

The Bureau's table plainly shows the presence in the river of a sufficient quantity of water to supply the central Arizona project, and the testimony further established that this quantity of water is now flowing in the river, wasted and unused.

ECONOMIC AND ENGINEERING FEASIBILITY

The testimony established that the project is definitely feasible, both on an economic and engineering basis.

The economic feasibility of the project, of course, entails many factors which are intangible and all of which inhere in the future, so that it is not susceptible of exact appraisal now. However, as has been previously indicated, the committee has concluded that the project can reasonably be expected to develop revenues to repay the reimbursable portions of the cost of construction within the useful life of the project.

As pointed out by the Bureau of Reclamation (p. 139, H. Doc. No. 136), the soils in the central Arizona project are friable, have good water-holding capacity, and are highly productive under irrigation and proper farming methods. For example, it was shown that the gross value of crops grown in the Salt River Valley Water Users Association project for the year 1946 was $41,043,385 or $179.62 per acre (p. 132 of the hearings on S. 1175, 80th Cong., 1st sess.).

The Bureau of Reclamation reports that the "total tangible benefits from the central Arizona project are measured by evaluation of the difference in the economic conditions expected to occur with and without the project" (p. C–110 of the appendixes to the Department of the Interior report on the central Arizona project, being Project Planning Report No. 3–8B.4–2). At page C–111 of said appendixes the Bureau presents such tangible benefits in a statistical form as follows:

(1) Annual damages expected to develop without the project, but which would be prevented by the project:		
Decrease in crop production measured in terms of gross crop value	$5, 272, 370	
Increase in pumping cost	1, 194, 700	
Total annual damages to be prevented		$6, 467, 070
(2) Annual advantages expected to develop with the project:		
Increase in crop production measured in terms of gross crop value	$18, 306, 210	
Reduction in pumping costs	494, 400	
Total annual advantages		18, 800, 610
(3) Total tangible irrigation benefits (rounded)		25, 268, 000

The Bureau summarizes the subject of tangible benefits in this language (p. 187, H. Doc. No. 136):

(*a*) *Tangible benefits*

(1) *General.*—The central Arizona project, through its functions of irrigation, power, silt control, recreation, municipal water supply, flood control, fish and wildlife conservation, and salinity control, provides benefits that are tangible in nature and national in scope. As a measure of the desirability of the project, the national benefits are compared with the national costs in the following discussion.

In comparing benefits and costs, the Bureau reports as follows (p. 190, H. Doc. No. 136):

(*c*) *Comparison of benefits and costs*

A summary of the various national benefits and costs ascribed to the central Arizona projects is presented in table F–9. As developed therein, total annual benefits would amount to $41,971,000, and total annual costs would amount to $25,783,500. The relationship between these factors can best be expressed in the

form of a benefit-cost ratio, which in this case would have a value of 1.63 to 1. This indicates that the development of the central Arizona project would return to the Nation, in the form of benefits, $1.63 for each dollar required to construct, maintain, and operate the project.

The Bureau summarizes intangible benefits in this manner (p. 190, H. Doc. No. 136):

(*d*) *Intangible benefits*

In addition to the benefits just indicated, there are many others of an intangible nature. The serious consequences that would result from a retrenchment in the economy of the area, including a probably enforced migration of many rural and urban families to more substantial places of livelihood, could be averted. Instead, much additional employment would result during construction, and as a result of operating the project and project lands. The increased production of electric energy would encourage industrial expansion throughout the entire power market area. Increased productive capacity and the wider use of electric energy for domestic use would improve living standards. Such benefits and many similar ones add to the desirability of the development. In addition, the strengthening of a unit of our national economy will add to the strength of the whole, both in normal times and in emergencies.

As is the case in multipurpose projects, the farmer cannot afford to repay all costs attributable to the irrigation features, and it is therefore necessary that some portion of the proceeds from sale of power be devoted to repayment of the cost of irrigation features. This is the normal situation, and accords with our established national policy. By way of illustration and comparison, the following table is submitted to demonstrate the situation of the central Arizona project as compared with several other well-known projects.

	(A) Average firm power rate [1]	(B) Portion of rate required for irrigation subsidy [2]	(B/A) Percentage
	Millions of kilowatt-hours	*Millions of kilowatt-hours*	
Central Valley	5.30	0.68	13
Colorado-Big Thompson	5.10	.89	17
Columbia Basin	1.00	.36	36
Missouri Basin	5.50	2.47	45
Central Arizona	4.82	.72	15

[1] Estimated average power rates in Average Rate and Repayment Studies for Power System on Bureau of Reclamation Projects, dated January 1949.
[2] Increase in estimated average power rate to provide for necessary irrigation subsidy.

The sale of power at the rates indicated, and the sale of water to irrigators at the rate of $4.50 per acre-foot and of municipal water at 15 cents per thousand gallons are the basis for the Bureau's estimates. The net result is that the project will liquidate the reimbursable items of its cost over a period of some 78 years, a not inappropriate length of time in proportion to the magnitude and importance of the project.

Witnesses representing California interests presented arithmetical comparisons and illustrations, such as expressions of the cost of the project on a per-acre basis in accordance with a premise or assumption preconceived by them. For example, they divided the entire cost of the entire project by the limited number of acres which they asserted would be benefited, thus arriving at the conclusion that the project was extremely expensive when expressed on a cost-per-acre basis. The committee has not elected to proceed upon any such

restricted hypotheses, but has viewed the project wholly and objectively against the perspective of the long period of its life and the over-all interests of the Nation and region affected. Thus considered, it is the opinion of the committee that the project is entirely feasible and economically sound.

The evidence at the hearings is replete with data and opinion upon the engineering aspects of the project. The situation is succinctly stated in the report of the Bureau of Reclamation (p. 191, H. Doc. No. 136) in these words:

> The potential development has engineering feasibility in the sense that no insuperable construction problems appear to be present.

LEGAL ISSUES

It is undisputed that there is a sufficient quantity of water in the Colorado River, available for use in the lower basin but not now in use, to supply the central Arizona project under S. 75. Witnesses for California and Nevada question Arizona's right to the use of this water.

The committee is of the opinion that the project should be authorized; but in fairness to these two States, the committee feels that they should have an opportunity to present their claims in the Supreme Court, and that in deference to their allegation that the United States is a necessary party consent should be given for the joinder of the latter as a party to the litigation. The committee has given tangible expression to its views upon this point in an amendment to the original bill, which is hereinafter set forth.

AMENDMENTS

A. Litigation in Supreme Court

Witnesses for California and Nevada differed with those of the other States over the relative rights of California and Arizona to waters in the lower basin of the Colorado River, and as to the right of Arizona to the water required to effectuate the principal irrigation features contemplated under this bill. On the other hand, there was essential agreement among all witnesses that many features of the project are urgently required and that such features should be promptly authorized so that construction could be expedited.

The Honorable, Earl Warren, Governor of California, in a letter written December 29, 1948, to the Secretary of the Interior makes clear that opposition to the central Arizona project stems from the dispute over the legality of the claims of the two States. He wrote, in part, as follows (p. 16, H. Doc. No. 136):

> Until there is a final settlement of the water rights by some method, the aggregate of Arizona and California claims to Colorado River water will exceed the amount of water available to the lower-basin States under the Colorado River compact and relevant statutes and decisions. It is only because a determination of the respective rights of the lower-basin States to the waters of the Colorado River system has not been made, that California submits any criticism of your proposed report. Whenever it is finally determined what water belongs legally to Arizona, it should be permitted to use that water in any manner or by any method considered best by Arizona, so long as that use does not conflict with the right of California to the use of its water from the Colorado River system. However, as long as the present unsettled situation exists, it is my opinion that each State in the lower basin must of necessity interest itself in the others' projects which would overlap its claims. For this reason the State of California cannot

concur in the proposal of the Secretary of the Interior for the authorization and construction of the central Arizona project. Accordingly, the attached report of the division of water resources deals with matters of water supply, water requirements and utilization, and feasibility of the central Arizona project.

Hon. Sheridan Downey, senior Senator from California, proposed an amendment (Committee Print No. 3, June 20, 1949) which among other things would have authorized most, if not all, of the construction projects recommended in this bill as to which there was no contention. His amendment would have authorized studies and reports as to other features in this bill, including the construction of dams and incidental works at Glen Canyon and at Marble Canyon in the Colorado River. The construction items which Senator Downey's amendment would have authorized, and their estimated costs, are as follows:

Bridge Canyon Dam and Reservoir	$191, 939, 000
Power plant	73, 419, 000
Coconino Dam and Reservoir	7, 487, 000
Buttes Dam and Reservoir	29, 037, 000
Power plant	1, 159, 000
Hooker Dam and Reservoir	15, 484, 000
Safford Valley improvements	4, 090, 000
Charleston Dam and Reservoir	9, 270, 000
Tucson aqueduct	6, 401, 000
Horseshoe Dam (enlargement) and Reservoir	7, 078, 000
Power plant	2, 628, 000
Power transmission system	83, 771, 000
Total	431, 763, 000

Analyzing the proposals thus made by Senator Downey, who represents California's view on the project herein recommended, it seems clear to the committee that the various objectives could be accommodated by a program which would authorize the project, yet defer appropriations required solely for the purpose of diverting, transporting, and delivering water from the main stream of the Colorado River for beneficial consumptive use in Arizona during the pendency of litigation to settle the conflicting legal claims. It also is clear that the works for such diversion, transportation, and delivery would be the last to be constructed in the normal course of completing the project. Under these circumstances the litigation which is specifically authorized in this bill might be well under way or even completed during construction of the uncontested features. The need both to facilitate and expedite litigation (if any were desired) is plainly recognized. To attain these ends, Senators O'Mahoney and Millikin proposed an amendment and submitted it to the Department of Justice for comment. The Department expressed concern that the amendment might be unduly restrictive. Whereupon Senator O'Mahoney wrote to the Attorney General as follows:

JULY 13, 1949.

Hon. TOM C. CLARK,
The Attorney General,
Department of Justice, Washington 25, D. C.

DEAR MR. ATTORNEY GENERAL: I am in receipt of the Department's letter of June 30, 1949, transmitted by Mr. Ford, the Assistant to the Attorney General, setting forth objections to the then proposed amendment to S. 75, which amendment was submitted by Senator Millikin and myself under date of June 20.

It is thought that the following language encompasses the desirable objectives and meets the criticisms expressed in the Department's letter:

"SEC. 12. If any State or States within 6 months after the effective date of this act shall begin a suit or suits in the Supreme Court of the United States to determine the right to the use of water for diversion from the main stream of the Colorado River through aqueducts or tunnels to be constructed pursuant to this act for beneficial consumptive use in Arizona, and to adjudicate claims of right asserted by such State or States or by any other State or States, under the Colorado River compact, the Boulder Canyon Project Act (45 Stat. 1057), the California Self-Limitation Act (Cal. Stat. 1929, ch. 16), and the Boulder Canyon Project Adjustment Act (54 Stat. 774), consent is hereby given to the joinder of the United States of America as a party in such action or actions. Any State of the Colorado River Basin may intervene or be impleaded in such suit or suits. Any such claims of right affected by the project herein authorized and asserted by any defendant State, impleaded State, or intervening State under said compact and statutes, or by the United States, may be adjudicated in such action. In any such suit or suits process directed against the United States shall be served upon the Attorney General of the United States."

It is therefore requested that the foregoing language be considered by the Department and that, if agreeable, an expression of your approval thereof be given at your early convenience.

Thanking you in advance for your courtesy and cooperation, and with every good wish, I am

Sincerely yours,

JOSEPH C. O'MAHONEY.

In due course the following reply was received:

JULY 21, 1949.

Hon. JOSEPH C. O'MAHONEY,
Chairman ,Committee on Interior and Insular Affairs,
United States Senate, Washington, D. C.

MY DEAR SENATOR: This is in response to your letter to the Attorney General dated July 13, 1949, in which you request the views of the Department of Justice on a proposed substitute for section 12 of the amendment to S. 75 submitted by Senator Millikin and you and designated Committee Print No. 1 of June 20, 1949.

The language of the proposal, which is intended to encompass the objectives and to meet the criticisms expressed in the letter of this Department dated June 30, 1949, has been considered as requested by you, and you are advised that the Department of Justice is of the view that it is in accord with the suggestions made in the letter of June 30.

Yours sincerely,

PEYTON FORD,
The Assistant to the Attorney General.

The amendment as set forth above in Senator O'Mahoney's letter, in which the Department of Justice concurred, was accordingly adopted by the committee.

B. Works at Glen Canyon and Bluff Canyon

The project originally contemplated a dam at Bluff Canyon on the San Juan River in Utah, above the works at Bridge Canyon. These improvements originally were intended primarily as an adjunct to Bridge Canyon Dam and Reservoir. Their principal functions were to control silt and thus protect the Bridge Canyon Reservoir from filling and to afford river regulation and flood control. However, more extensive and much more beneficial works at Glen Canyon, in the Colorado River in Utah, would not only fully protect the Bridge Canyon works from silt but would render the facilities at Bluff Canyon unnecessary. The Glen Canyon Dam, which is to be reported on by the Bureau of Reclamation, is, according to testimony presented to the committee, an essential project in accordance with the Colorado River compact for the regulation of river flow and power production. It is to be presented as a separate project due for early consideration by the committee. That the construction of works at Glen Canyon

will be of great public interest and value seems clear to the committee. Therefore, in accord with Senator Watkins' views and suggestions, S. 75 was amended in a manner to eliminate the dam at Bluff Canyon and to protect the site at Glen Canyon from flooding. The recommended amendment, to be inserted after the colon in line 19, page 3, of the bill, follows:

Provided, That this authorization shall not include (a) any works, dam, or reservoir at the Glen Canyon site or any other site in the upper Colorado River Basin, or (b) any dam, reservoir, or works in the lower Colorado River Basin which would flood the Glen Canyon site;

The words "*Provided, however,*" in line 19, page 3, of the bill were amended to read "*Provided further, however*".

C. Protection of rights and properties of Indians

Although the committee entertains no doubt that the central Arizona project will benefit the Indians of Arizona in common with their fellow citizens who reside in that State, it is deemed desirable to provide specially for the protection of those of such Indians whose property and activities may be adversely affected by the construction and operation of the project. It is believed that no drastic or extensive damages will occur and that no individual or tribe will be critically affected.

The Secretary of the Interior addressed a letter on this subject to the committee and proposed a specific amendment designed to create appropriate safeguards. Accordingly, S. 75 has been amended by the addition of a new section (14) as follows:

(a) In aid of the construction, operation, and maintenance of the works authorized by this Act, there is hereby granted to the United States, subject to the provisions of this section, (i) all the right, title, and interest of the Indians in and to such tribal and allotted lands, including sites of agency and school buildings and related structures, as may be designated from time to time by the Secretary in order to provide for the construction, operation, or maintenance of said works and any facilities incidental thereto, or for the relocation or reconstruction of highways, railroads, and other properties affected by said works; and (ii) such easements, rights-of-way, or other interests in and to tribal and allotted Indian lands as may be designated from time to time by the Secretary in order to provide for the construction, operation, maintenance, relocation, or reconstruction of said works, facilities, and properties.

(b) As lands or interests in lands are designated from time to time under this section, the Secretary shall determine the just and equitable compensation to be made therefor. Such compensation may be in money, property, or other assets, including rights to electric energy developed at any of the generating plants herein authorized. In fixing such rights to electric energy, including the rates and other incidents thereof, the Secretary shall not be bound by section 4 of this Act. The amounts of money determined as compensation hereunder for tribal lands shall be transferred in the Treasury of the United States from funds made available for the purposes of this Act to the credit of the appropriate tribe pursuant to the provisions of the Act of May 17, 1926 (44 Stat. 560). The amounts due individual allottees or their heirs or devisees shall be paid from funds made available for the purposes of this Act to the superintendent of the appropriate Indian agency, or such other officer as shall be designated by the Secretary, for credit on the books of such agency to the accounts of the individuals concerned.

(c) Funds deposited to the credit of allottees, their heirs or devisees, may be used, in the discretion of the Secretary, for the acquisition of other lands and improvements, or the relocation of existing improvements or the construction of new improvements on the lands so acquired for the individuals whose lands and improvements are acquired under the provisions of this section. Lands so acquired shall be held in the same status as those from which the funds were derived, and shall be nontaxable until otherwise provided by Congress.

(d) Whenever any Indian cemetery lands are required for the purposes of this Act, the Secretary is authorized, in his discretion, in lieu of requiring payment

therefor, to establish cemeteries on other lands that he may select and acquire for the purpose, and to remove bodies, markers, and appurtenances to the new sites. All costs incurred in connection with any such relocation shall be paid from moneys appropriated for the purposes of this Act. All right, title, and interest of the Indians in the lands within any cemetery so relocated shall terminate and the grant of title under this section take effect as of the date the Secretary authorizes the relocation. Sites of the relocated cemeteries shall be held in trust by the United States for the appropriate tribe, or family, as the case may be, and shall be nontaxable.

(e) The Secretary is hereby authorized to perform any and all acts and to prescribe such regulations as he may deem appropriate to carry out the provisions of this section.

(f) Nothing in this Act shall be construed as, or have the effect of, subjecting Indian water rights to the laws of any State.

BUREAU OF RECLAMATION AND OTHER REPORTS

The Secretary of the Interior has approved and submitted an extensive report on the central Arizona project, which report was prepared by the Bureau of Reclamation and is entitled "Project Planning Report No. 3–8b.4–2, December 1947." The report is contained in two volumes, the first of which is somewhat of an epitome of the second, the latter being much more extensive.

The first volume is printed in the latter part of House Document No. 136, Eighty-first Congress, first session, entitled "Central Arizona Project, Letter from the Secretary of the Interior Transmitting a Report and Findings on the Central Arizona Project." The first part of this House document is devoted to reports and matters collateral to the Secretary's report, a circumstance necessitating a degree of care in differentiating the collateral material from the report proper, which begins at page 110 of the House document.

The report recommends that Arizona adopt an underground water code. Arizona has done so. The code will stabilize the present underground water situation and in future will conserve and contribute to the effective utilization of the supplemental water which S. 75 would provide.

The House document sets forth certain letter reports from the Secretary of Agriculture and from the Chairman of the Federal Power Commission. More recent and pertinent letters from both sources are not included in the publication, but they do appear in the hearings on S. 75 and do give data in support of the project.

CONCLUSIONS

In reporting the bill, S. 75, favorably and recommending its immediate enactment, the committee has come to the following conclusions:

1. There is palpably an urgent need for the benefits which this bill would provide, and construction work to speed such benefits should be authorized promptly.

2. The welfare and livelihood of a large number of citizens and the economic future of a substantial area of this country are dependent upon the early completion of this project.

3. No substantial opposition has been raised against many of the constituent parts of the project, including the dam and power plant at Bridge Canyon and works within Arizona and New Mexico.

4. Water litigation in the Supreme Court may require, as it has in the past, a period of many years.

5. California possesses the physical works and facilities by means of which she can divert Colorado River water even to the extent of her maximum claim, so that in this respect she enjoys a distinct advantage. Arizona has no facilities to obtain Colorado River water for use in Arizona.

6. If litigation is deemed necessary to settle the conflicts between California and Arizona, such litigation should in fairness be both facilitated and expedited toward a full resolution of issues. Although it seems undesirable for the Congress to attempt to constrain any State to participate in any such litigation, by the same token participation should not be denied to any State, the rights of which may be affected by the project or by litigation in connection therewith.

7. The project will make a substantial contribution to the conservation and utilization of great natural resources and a corresponding contribution to national and regional welfare.

8. The project is feasible.

The committee therefore urges prompt authorization of the project, subject to the limitations appearing in the bill as amended.

MINORITY VIEWS

The undersigned minority of the Committee on Interior and Insular Affairs submits the following views in opposition to the pending bill.

SUMMARY

I. What the bill would authorize:

1. A grandiose irrigation scheme, to pump water 1,000 feet high and transport it over 300 miles, to irrigate ordinary field crops, such as cotton, grains, and hay.

2. An admittedly infeasible 80-mile tunnel, which would cost $550,000,000.

3. A power dam, loaded with uneconomic commitments; one-third of the power generated to be donated for project pumping, the other two-thirds to pay the entire reimbursable construction cost of the project, irrigation as well as power.

II. The cost is excessive; initially $738,000,000, ultimately over 1 billion and a quarter dollars, more than has been appropriated for reclamation in the last 11 years.

III. Federal subsidies are unprecedented:

1. Nonreimbursables written off, $73,000,000.
2. Interest, $465,600,000.
3. Contributed in electric energy, $315,000,000.

Total, $850,000,000.

IV. Results would not justify the cost; the project would bail out large landowners who have speculated in a war-boom development in the face of a known shortage of underground water and also permit irrigation of a large acreage of new lands. The works would, at a cost of $1,750 per acre, irrigate land worth, with water, $300 per acre.

V. Estimates of Colorado River water needed are exaggerated; the United States Geological Survey indicates the basic factors on which the actual need should be evaluated are unknown and should be investigated.

VI. The plan of repayment cannot work out:

1. The irrigators cannot pay 1 cent of irrigation construction cost, even for their local distribution system or drainage system.

2. Power must pay all reimbursable construction cost.

3. Determination of the repayment period is delegated to the discretion of the Secretary of the Interior.

4. (*a*) Bridge Canyon power would not pay out the project over the assumed 70-year period or ever. By the Watkins amendment, Bluff Dam is eliminated from the project. The Bureau estimates of Bridge power revenues are predicated on the existence of Bluff Dam. Without it, Bridge Canyon Reservoir would be completely filled with silt in 30 years. The amendment renders the Bureau's revenue estimates totally invalid and the project totally infeasible.

(*b*) Estimates of Bridge Canyon returns are based on ideal operation under conditions of river flow assumed to be known in advance.

(*c*) To attain Bureau estimates of power revenues would require invasion of legal rights of Hoover Dam power contractors.

(*d*) Estimates of irrigation revenues will not be realized.

VII. All departmental reports except that of Interior are highly critical of economic and engineering features of the project; the President has declared that it is not in accord with his program.

VIII. The project has no dependable water supply; the Secretary of the Interior states that the right of Arizona to water for the project is involved in long-standing controversy and that if contentions of California are correct, there will be no dependable water supply available for the project. The situation should be cleared up by adoption of Senate Joint Resolution 4, permitting the United States to be joined in an interstate suit in the Supreme Court. The approach taken in S. 75, by authorizing the entire project, then waiving the immunity of the United States to suit, and then suspending expenditures for the aqueduct to central Arizona pending the suit, is unprecedented and wrong. The United States Treasury should not be committed to build the aqueduct at all when the basic feature of water supply is an unknown quantity.

I. WHAT THE BILL WOULD AUTHORIZE

1. A grandiose irrigation scheme

The main objective of the bill is to furnish a supplemental irrigation water supply to an area in Arizona called the central Arizona project. To do this it is proposed to pump water from the Colorado River to a height of 987 feet, nearly twice the height of the Washington Monument. The water is then to be transported through a main canal 315 miles long, a much greater distance than from Washington to New York. The irrigation use then to be made of the water is, almost exclusively, for the growing of ordinary field crops, such as cotton, grains, and hay. The use of such extravagant means to reach such a moderate result is, on the face of it, utterly fantastic and economically unsound. No comparable irrigation system, public or private, has ever been constructed.

2. An admittedly infeasible tunnel

The bill would authorize a tunnel 80 miles long running under several mountain ranges, by which the water might be conveyed by gravity from the river to the proposed main canal. Sponsors of the project freely admit that the tunnel is now economically infeasible. No official cost estimate was submitted to the committee. The bill (p. 3, line 19) says that construction of the tunnel shall be deferred "until Congress by making appropriation therefor has determined that economic conditions justify its construction." No evidence indicates what such "economic conditions" might be.

Thus, for the first time in history, the Congress is besought to authorize a project, without even a cost estimate, when its own sponsors say it is infeasible. As a result, the unprecedented responsibility for determining when, if ever, the tunnel may be feasible would be improperly cast upon the Appropriations Committee.

3. A power dam, loaded with uneconomic commitments

The bill would authorize Bridge Canyon Dam on the Colorado River. This dam, the size of Hoover Dam, would be built solely for power generation.

One-third of the power generated (1,500,000,000 kilowatt-hours each year) would be committed for pumping water up the 1,000-foot lift for the irrigation scheme. That is more electric energy than was used in the entire State of Arizona (1,206,000,000 kilowatt-hours) in 1943. All the energy which can be generated at Bridge Canyon is badly needed in the present power market of the Pacific Southwest. To commit one-third of the Bridge Canyon power to the extreme pump lift required for the central Arizona project entails the consequence that 2,500,000 barrels of fuel oil per year must be consumed to serve other power needs in the Southwest for which the Bridge Canyon power could be used. As is later shown, there is no water supply available for the project, except by taking it from existing projects, and the welfare of the United States, as a whole, cannot therefore be bettered by such a process. Under these circumstances to commit one-third of the Bridge Canyon power to the extreme pump lift, with the modest production of crops to be achieved, would be an egregious waste of the Nation's natural resources.

The remaining two-thirds of the Bridge Canyon power would be sold. The rates for that power would have to pay the entire cost of the dam and power installations. In addition, it is proposed to make the rates sufficiently high to pay the entire capital cost of the irrigation system. Use of Federal funds to develop low-cost electric power for the benefit of the people of a region is justifiable. But the result here, as the Federal Power Commission has indicated (see appendix A), would not be low-cost power. The power consumers of the Pacific Southwest would be saddled with an unreasonable and unjustifiable burden.

Bridge Canyon Dam, as the Federal Power Commission points out, has no physical relation to the central Arizona project. The minority favors construction of this dam and does not object to its contributing for the benefit of irrigation in a reasonable measure. It objects to burdens on Bridge Canyon which are excessive.

II. COST IS EXCESSIVE

The project is by far the most costly single reclamation project, for the primary benefit of a single State, that has ever been conceived or presented to the Congress. According to Bureau of Reclamation estimates, the cost of the initial works would be $738,000,000.

This amount excludes the cost of the 80-mile tunnel and appurtenances, which is understood to be an additional $550,000,000. The total ultimate cost would be $1,288,000,000.

The minority believes that these cost estimates are insufficiently grounded and that actual costs would greatly exceed the estimates.

But on the Bureau's estimates, the initial cost would be twice the cost of the Panama Canal. It would equal or exceed that of the Tennessee Valley Authority. It would equal that of the proposed St. Lawrence seaway. It would be nearly five times the cost of the Boulder Canyon project.

The aggregate amount appropriated for all reclamation projects in the 17 Western States in the last 11 years has been $993,307,017.

The ultimate cost of the single central Arizona project would far exceed that amount.

III. FEDERAL SUBSIDIES ARE UNPRECEDENTED

The taxpayers of the United States would make an outright gift of the following subsidies, totaling $850,000,000:

1. Nonreimbursables written off, $73,000,000

Of this amount, $33,000,000 is accounted for by one item, "Recreation," chiefly ($31,000,000) at one reservoir, Bridge Canyon, which is relatively small (one-tenth the capacity of Lake Mead, behind Hoover Dam) and is located at the bottom of a deep and inaccessible canyon. The minority believes that an independent bill appropriating $31,000,000 to the National Park Service for establishing recreation facilities at such a spot would receive, and would deserve, scant consideration. Nor should such a considerable item be more easily favored because it is tucked away as an incident to this project.

Another item of $3,000,000 is set up for "Fish and wildlife." Like the "Recreation" item, it is not supported by any showing of the amounts which the Government would expend as the costs of the functions mentioned. The only explanations presented are imaginative estimates of national benefits on an annual basis, measured by no rational yardstick and apparently picked out of thin air. These national benefits are then capitalized at 2.5 percent to produce the large figures named.

The minority has no quarrel with the principle that actual expenditures made for the service of Federal functions should be nonreimbursable. It insists that sound and scrupulous proof should be made of the real costs involved and that "blue sky" estimates should not be used to bolster up an unsound project at the expense of the Nation's taxpayers.

A third allocation of $5,000,000 is for "Salinity control." This item is nothing more nor less than land drainage. Heretofore, the farmers on all reclamation projects have paid for their own drainage works. The benefits are private, not national. No reason is seen why, by the use of a new label, the farmers on this project should be singled out for a special favor at the expense of the Nation's taxpayers.

2. Interest, $465,600,000

The reimbursable indebtedness would be $665,000,000. At 2 percent, over the least repayment period proposed in the hearings, 70 years, not including a 15-year construction period, the average annual interest paid by the taxpayers of the United States on that part of the national debt would be $6,650,000 and the total, $465,600,000.

No interest on any feature of the project would be repaid to the Treasury as compensation for the use of the Government's money. It is said that interest would be charged on the commercial power features of the project, but the statement is essentially untrue. It is actually proposed to divert this so-called interest, amounting to $350,000,000, and apply it to repayment of the capital costs allocated to irrigation.

The minority does not dissent from the wisdom of the reclamation law, under which no interest is charged on irrigation features of a reclamation project during the repayment period fixed by that law,

50 years. It sees, however, no excuse for relieving commercial power plants, transmission lines, and related facilities from paying into the Treasury interest on the money advanced by the taxpayers of the United States to build them. It calls attention, moreover, to the way in which the interest actually borne by the Government is magnified by this process, taken together with the extension of the repayment period beyond 50 years.

3. Contributed in electric energy, $315,000,000.

One-third of the energy output of Bridge Canyon (1,500,000,000 kilowatt-hours per year) is committed to the pumping of irrigation water. The irrigators pay no capital charge therefor. If sold as commercial power, that energy would produce an additional revenue of $4,500,000 a year, or in 70 years, an aggregate of $315,000,000.

The total Federal subsidy is at least $850,000,000.

IV. RESULTS WOULD NOT JUSTIFY THE COST

The ends sought to be attained by the bill furnish no recognizable justification for a project of such tremendous magnitude. The objective is said, primarily, to be to "rescue" 150,000 acres which might otherwise have to go out of production. This area is about equal to that put under irrigation for the first time, in central Arizona, during the war boom in agricultural prices. It is owned by fewer than 500 individuals, who have probably already recouped their investment from wartime profits. The development has occurred in the face of a well-known deficiency of the underground water supply and is characterized by Arizona witnesses as a "mining" operation.

In addition, it is said that the project will irrigate 73,500 acres of land represented as having an "irrigation history," but asserted to be idle for lack of water. Proponents of S. 75 admit that no such area can be defined or located. As a matter of fact, such an acreage is roughly equal to that normally idle at any one time, in any irrigation enterprise of comparable size. In irrigation projects, 10 to 12 percent of the acreage is expected, for various reasons, to be idle in any one year. It does not use irrigation water. A water supply is not required for such idle land. Surprisingly, according to the Bureau testimony, nearly half of the project water to be applied to irrigation would be required for this 73,500 acres.

The United States is, then, asked to commit itself to an expenditure of over $1,000,000,000, to pump water a thousand feet high, and transport it over 300 miles, to "rescue" 150,000 acres now in cultivation to ordinary field crops—cotton, grains, and hay—and to permit 73,500 acres, evidently new desert lands, to be brought under cultivation to like crops.

The costs of the project allocated to irrigation alone will be at least $1,750 per acre for the land in both categories. That is $280,000 for a 160-acre farm. General farming land in Arizona, with water, is worth not to exceed $300 per acre, or $48,000 for the same 160-acre farm.

The project's sponsors say that this project is required to prevent a total collapse of the economy of the State of Arizona. This claim is patently exaggerated. As to the 73,500 acres asserted to have had an "irrigation history," it is evident from the testimony of Bureau witnesses that this land has not been irrigated for a generation. The

economy of Arizona has for many years been adjusted to its not being irrigated. As to the 150,000 acres of land presently irrigated and sought to be "rescued," it must be remembered that the irrigation of this land has been a speculative wartime venture, dependent on "mining" a known insufficient water supply. It is, unfortunately, always necessary to make adjustments when a mined resource is exhausted.

Further, as a Bureau witness testified, it could hardly be expected that appropriations would be made for the project at a greater rate than $50,000,000 a year. At that rate, 15 to 25 years would be required to complete the project. Long before such a period elapses, the economy of Arizona will have adjusted itself, whether on the prewar basis or on some new basis, arrived at by a change of crops or otherwise. The claim that the project would accomplish the asserted "rescue" is, thus, wholly specious.

V. ESTIMATES OF COLORADO RIVER WATER NEEDED ARE EXAGGERATED

The Bureau's estimate of water supply required to be imported for the project is believed to be based on insufficient and inconclusive data and to be greatly exaggerated. It is probable that the tremendous cost of the aqueduct works and the perpetual high annual pumping cost could be reduced to a marked degree by more realistic evaluation of the need for imported water.

From a letter in the record from the Director of the United States Geological Survey, dated June 9, 1949, it appears that a great many factors relating to the safe yield of the underground basin and the possibility of increasing the availability of local water sources are as yet not adequately known or evaluated. Among these factors are:

(1) Actual surface and ground water flow into the area.

(2) Actual surface and ground water flow out of the area.

(3) Augmentation of the local supplies by spreading of floodwaters to recharge the underground basin.

(4) Extent to which waste of underground water absorbed by nonbeneficial vegetation in swamp areas can be reduced. By elimination of such vegetation, it is known that several hundred thousand acre-feet of water per year can be saved for beneficial use.

(5) Rates of consumptive use of water by crops.

(6) Extent to which quality of irrigation water can be improved by elimination of salt springs and other sources of contamination.

(7) Development of unused local water sources.

It is indicated by the Director's letter that these important subjects, which control any conclusion as to the amount of water which should as an economic matter be sought to be imported from the Colorado River, have not been adequately investigated. He suggests an outline of a "comprehensive and intensive water investigation needed for the maximum utilization of the available water supplies in the area." The time required for such investigation, 3 years, and the cost, $600,000, appear moderate and justified.

It is apparent that the estimate of the need for imported supply used by the Bureau of Reclamation, 1,200,000 acre-feet a year, is not based on adequate investigation of actual need and is definitely exaggerated. Importation of such a quantity from the Colorado River would, in the long run, lead to one of two results: either the water logging of large parts of the area, or, contrary to the professed

object of proponents of S. 75, a great expansion of the irrigated area of central Arizona. There is good ground to believe that, upon thorough study, a far less costly solution for the "rescue" of central Arizona can be found than is proposed by S. 75.

VI. THE PLAN OF REPAYMENT CANNOT WORK OUT

1. The irrigators cannot pay their way

The central Arizona project is the first reclamation proposal ever presented to the Congress on which the irrigators cannot pay one dollar on the construction cost of their irrigation works. Indeed, the costs of the project are, without dispute, so great that the irrigators cannot even pay as much as the costs normally assigned to operation and maintenance.

Ordinarily such costs include a component of capital cost for the power used for pumping. In the central Arizona project that component is omitted. It is about half as large as the total sum which the irrigators are to pay. In other words, they are able to pay only two-thirds of normal operation and maintenance costs.

Again, the irrigators are not able to pay the cost of their irrigation distribution system or their drainage system, which have in all previous reclamation projects been required to be repaid by the irrigators. The estimated cost of the distribution system is $54,000,000, and of the drainage system, $10,000,000.

2. Power pays all reimbursable construction costs

Consequently the power revenues from two-thirds of the energy generated at Bridge Canyon must, except for nonreimbursables, pay the entire bill for construction of the dam and all of the power works, including generating plants, transmission lines and substations, etc. They must also pay for all the irrigation works, including the distribution system and the portion ($5,000,000) of the drainage system which is not forgiven as nonreimbursable. As stated, they must even pay the capital costs attributable to the power capacity which is assigned to be used for irrigation pumping, although this is normally a component of the price of such power and paid by the irrigators as an expense of operation.

3. Determination of the repayment period is delegated to the discretion of the Secretary of the Interior

The Congress has invariably, up to now, determined the period within which repayment must be made for the construction costs of reclamation projects. S. 75, in this respect, is a violent departure from this settled rule. Section 3 provides that the repayment period shall be—

> such reasonable period of years, not to exceed the useful life of the project, as may be determined by the Secretary.

Considering the fact that some of the Roman aqueducts and the Roman roads, over 2,000 years old, are still in use, this formula, for which the Bureau of Reclamation has been reaching out for several years, does not seem to be a prudent one. No one can now know the worth of hydro power in the far future. The reduction of annual payments to near zero cannot be sanctioned. The absorption of interest by the United States over centuries cannot be justified.

However, Bureau witnesses, after using a variety of bases in reports and testimony, concluded by suggesting a period of 70 years. Accordingly, the possibility of repayment of the costs of the particular project may be tested by that period.

4. The project costs will not be paid

(*a*) *Bridge Canyon estimated power revenues would not be realized through 70 years.*—Bridge Canyon Reservoir would have relatively small capacity (one-tenth of Lake Mead). The river's flow is erratic and carries great volumes of silt.

Only a great dam with very large storage capacity, constructed upstream from Bridge Canyon, such as is possible at or near Glen Canyon, would impound the silt and regulate the flow of the river so as to enable Bridge Canyon to produce the constant production of firm energy which must be sold throughout 70 years. Witnesses for the Bureau of Reclamation admitted that the Glen Canyon Dam is indispensable as a protection to the Bridge Canyon power output, and said that the Bureau is now making studies of such an additional dam.

The cost of a Glen Canyon Dam is understood to be much in excess of a quarter of a billion dollars. No provision for its financing or repayment is made in S. 75. The amendment to section 1, proposed by Senator Watkins and accepted by the committee, would definitely prevent its construction as an adjunct to Bridge Canyon.

It may be said that Glen Canyon Dam will someday be built. But it is not known whether Glen Canyon Dam will stand on its own feet financially. It may or may not produce sufficient revenues to amortize its cost without subsidization from Bridge Canyon power revenues, or from the Federal Treasury.

The Watkins amendment demonstrates that Glen Canyon Dam cannot be leaned on by the project, as furnishing either water storage or silt control. It makes it evident that if and when Glen Canyon is authorized and built, it will be designed and operated to serve the purposes of the upper basin in which it lies. Upon this basis, it is quite unlikely that Glen Canyon would be built within the useful life of Bridge Canyon Reservoir, which, as shown hereinafter, is only 30 years.

Again, the project, as proposed by the Bureau of Reclamation, includes construction of the Bluff Dam on the San Juan River in the upper basin. The Bluff Dam would be a stopgap which would give Bridge Canyon temporary and partial aid by river regulation and silt detention. The Watkins amendment also excludes this dam from the project.

The engineering evidence is clear that without the silt storage afforded by the Bluff Dam, the Bridge Canyon Reservoir would be filled with silt to the dam's spillway level in 30 years. Even with Bluff constructed, Bridge Canyon Reservoir would be filled with silt in from 40 to 50 years.

Long before the reservoir is completely silted up, the lack of storage capacity would seriously impair the firm power production. During the balance of the 70-year period it is improbable that a high-head power plant could be operated at all, because the silt flowing through the generating works would destroy them. Regardless of this fact it would be a mere run-of-the-river plant, producing a minimum of

firm or guaranteed power. During the few months of the flood season, large amounts of "dump" power would be produced, but during the many months of the low-flow period hardly enough power would be produced to meet the requirements of the project's irrigation pumping load.

Also, as shown by Bureau reports, without Bluff the capacity of the spillway at Bridge Canyon Dam must be greatly increased, at an additional cost of many millions of dollars. Neither this cost nor its repayment has been included in the Bureau's financial studies.

The Bureau's estimates of Bridge Canyon power production and resulting revenues are totally invalid without a Glen Canyon Dam. Without either Glen or Bluff, it is self-evident that Bridge Canyon revenues would be so reduced that they would not pay the project out, either in 70 years or in any period at all.

(*b*) *Estimates of revenues from Bridge Canyon are unduly optimistic.*—The estimates of revenues from the Bridge Canyon power plant are based upon an ideal operation of the power plant at Bridge Canyon Dam, which could only be obtained through a foreknowledge, several years in advance, of precipitation and run-off of the Colorado River. Such ideal operating conditions could not be realized under normal circumstances.

The flow of the Colorado River is erratic. It was varied within extremes as wide as from 5,000,000 to 25,000,000 acre-feet per annum. The tremendous snow storms of the past winter were anticipated in March of this year to produce unusual flood flows, but the actual result has been only an average run-off.

It is easy, working from records of known past series of years, to produce on paper a plan of optimum operation of power works and estimates of maximum revenues. It is not possible to have any assurance that, for any period in the future in which the river's flow unknown, such estimates will prove out. If they do not, the financial feasibility of the project is impaired.

(*c*) *To attain Bureau estimates of power revenues would require the invasion of rights of Hoover Dam power contractors.*—To make "firm" power of practically all the energy produced at Bridge Canyon, the Bureau plans to "coordinate" Bridge Canyon production with that at Hoover Dam, in such a way as to violate the contracts of the Hoover Dam power contractors, to their substantial detriment. The Bureau would credit Bridge Canyon with power produced at Hoover, without charging any of the cost of the Hoover plant to the Bridge Canyon project. Without such handling of the two plants, only a small part of the energy produced at Bridge Canyon could be sold as firm power and produce the revenues which firm power commands. The revenues estimated by the Bureau cannot be realized without violation of existing contracts executed by the United States.

(*d*) *Estimates of irrigation revenues will not be realized.*—The estimates of revenues from the delivery of irrigation water assume that irrigators in central Arizona will, year in and year out, take and pay for the full supply of water. Without that assumption, the financial feasibility of the project is again impaired.

The climate of central Arizona is shown by nearly a century of records to be characterized by alternating cycles or series of years of high and low rainfall. During wet cycles, which have lasted from

11 to 18 years consecutively, the local water supplies of central Arizona have been sufficient to supply all irrigation needs and to build up underground water tables to the point that large areas were threatened with waterlogging and pumping of large numbers of wells had to be employed to drain them. During such extended periods, which will, of course, recur many times within the proposed repayment period, it is not to be expected that farmers will buy and pay for high-priced Colorado River water for which they have no use.

The estimates of irrigation revenues used by the sponsors of the project are, therefore, mere paper estimates and do not carry conviction.

VII. DEPARTMENTAL REPORTS ARE CRITICAL

The reports of the Government Departments, other than Interior (Bureau of the Budget, Agriculture, Federal Power Commission, and Army) indicate serious questions as to the engineering and economic features of the project and as to methods employed in computing benefits. Excerpts from such reports are appended hereto (appendix A).

Special attention is called to the concluding paragraph of the letter of the Director of the Bureau of the Budget:

> The foregoing summary and the project report have been reviewed by the President. He has instructed me to advise you that authorization of the improvement is not in accord with his program at this time and that he again recommends that measures be taken to bring about prompt settlement of the water-rights controversy.

VIII. THE PROJECT HAS NO DEPENDABLE WATER SUPPLY

The testimony shows that all of the water supply available under the Colorado River compact to the States of the lower basin (Arizona, California, Nevada, New Mexico, and Utah) will be required for projects which are now in existence and operating. Accordingly, the central Arizona project can only have a water supply for the new use which is proposed, by taking it from some other project. From an economic standpoint, it cannot be seen that the welfare of the United States can be bettered by spending a billion dollars to deprive one area of water in order to supply it to another. No national benefit would ensue.

The lack of assured legal right to the water, however, is even more important.

The Secretary of the Interior, in reporting on the central Arizona project, says:

> Assurance of a water supply is an important element of the plan yet to be resolved. * * * If the contentions of the State of Arizona are correct, there is an ample water supply for this project. If the contentions of California are correct, there will be no dependable water supply available from the Colorado River for this diversion. * * * The Bureau of Reclamation and the Department of the Interior cannot authoritatively resolve this conflict. It can be resolved only by agreement among the States, by court action, or by an agency having proper jurisdiction.

Obviously, the expenditure of the vast sums of money proposed should not be authorized, in the absence of a legal right to a dependable water supply. The Senators from Nevada and California have submitted, in Senate Joint Resolution 4, an affirmative and clean-cut

method whereby the long-standing controversy over rights to the lower basin water can be expeditiously resolved. The resolution waives Federal immunity to suit in the Supreme Court, which is necessary to enable the States to litigate the issues and solve the problem.

An attempt has been made by supporters of S. 75 to cure the situation by a different approach, viz, the enactment of that bill with the addition of sections 12 and 13. Those sections would provide that Federal immunity to suit be waived in any action brought by any State within 6 months after the effective date of the act "to determine the right to the use of water for diversion from the main stream of the Colorado River through aqueducts or tunnels to be constructed pursuant to this Act for beneficial consumptive use in Arizona." They would further provide that no moneys shall be expended for the construction of works authorized by the act, which are required solely for delivery of water from the river for use in Arizona "during a period of 6 months after the enactment of this Act and during the pendency of any suit or suits in which the United States shall be joined as a party under and by virtue of the consent granted in section 12 of this Act."

The committee should have taken pains to correct many glaring defects of form in sections 12 and 13, only one of which need be cited for illustration. Section 13 would suspend the construction of the aqueduct to central Arizona during the pendency of the litigation only. It would permit such construction to proceed in the event the Supreme Court holds that Arizona has no water right for the project whatsoever.

During the hearings, supporters of S. 75 vigorously opposed Senate Joint Resolution 4 upon the ground that the proposed lawsuit was not "justiciable" within the decisions of the Supreme Court. Conceding the necessity of the litigation, they urged that it was necessary that some project in Arizona be authorized before California could have a justiciable case. It is presumably for that reason that they have urged the extraordinary step of approving the hybrid measure, S. 75, plus a waiver of immunity of the United States to suit.

The proposition that authorization of a project is needed to make the case justiciable rests solely on assertion. Not one decision of the Court so holds. On the contrary, its last relevant decision, *Nebraska* v. *Wyoming* (325 U. S. 589), supports strongly the view that the case is at present justiciable. What proponents of S. 75 hope is that the authorization of the project will throw the weight of Congress into the scales in the Supreme Court. Proponents have testified that such authorization would have value to them as evidence before the Court.

The approach sought in sections 12 and 13 is wrong. It purports to commit the Treasury of the United States to the expenditure of a billion dollars or more when the Congress has been clearly and directly informed by the responsible Department that the claims of Arizona to a water supply are in grave controversy.

Until the Supreme Court speaks, the Congress will not have information as to whether Arizona has a right to a sufficient water supply upon which to predicate an authorization of the central Arizona project.

The Bureau's report shows that the project, as designed, requires a water supply of 1,200,000 acre-feet per annum. When the Court

speaks, it may be that Arizona has no right to any water supply for the project, or its right may be for some quantity intermediate between 1,200,000 acre-feet and zero. If the decree shows a supply available which is materially less than 1,200,000 acre-feet, the project, if feasible at all, must be redesigned to fit the supply. To authorize a project now, when it is designed upon an assumption unsupported by any information upon which the Congress may rely, defies all precedent. It is not good legislation.

IX. CONCLUSION

As a matter of course, it is incumbent on proponents of a project to show that a legal right to a dependable water supply for the project exists. Here the right to a water supply is embroiled in grave and long-standing interstate controversy. The majority of the committee has chosen the extraordinary course of authorizing the project when that course could only be the sound one if Arizona's claims in a very complex and difficult lawsuit were known in advance to be 100 percent correct. That is not known.

Entirely independent of this, the project as proposed is hopelessly uneconomic and infeasible; it would be an unjustified burden on the Nation's taxpayers and on the consumers of Bridge Canyon power, and an unreasonable waste of the Nation's natural resources.

To pump water 1,000 feet high, or carry it through an 80-mile tunnel, and transport it over 300 miles to irrigate common field crops, some of which are already subsidized by the Federal Treasury; to obligate the Treasury for over 1 billion and a quarter dollars for such a mediocre end; to allow unprecedented Federal subsidies, including a vastly inflated item for "recreation," and the application of the interest component of power rates to pay irrigation capital costs, rather than return it to the Treasury as compensation for the use of the money loaned to build power works; to irrigate land, at a cost of $1,750 per acre, which will be worth $300 per acre with water; to do this when the actual need for the estimated quantity of imported water is shown by a disinterested and highly respected Government agency to be unknown; to base estimates of repayment on figures of power revenues, when physical conditions will preclude their being realized and on irrigation revenues that will obviously not be received; to do these things when the reports of all Government departments except Interior are sharply critical of basic economic features of the project and the President has declared that it is not in accord with his program; all this the minority conceives to be preposterous.

For these major reasons, the minority recommends that S. 75 be not adopted.

APPENDIX A

Extracts From Comments of Federal Agencies on Report of the Secretary of the Interior on Proposed Central Arizona Project

Project planning report No. 3–8b.4–2 dated December 1947

The following comments with respect to various aspects and features of the proposed central Arizona project are quoted from reports of Federal agencies as follows: Department of Agriculture, May 5, 1948; Department of the Army, May 12, 1948; Federal Power Commission, May 21, 1948; Bureau of the Budget, February 4, 1949.

UNRELATED FEATURES INCLUDED IN PROJECT

Comments of the Federal Power Commission and of the Department of the Army with respect to certain project features are quoted as follows:

Federal Power Commission

"The Commission staff has reviewed the Bureau's report and points out that the Bridge Canyon project and its two auxiliaries, Bluff and Coconino Reservoirs, have no essential physical relationship with the central Arizona diversion project. These reservoirs are not needed to regulate flow for the central Arizona diversion, nor would the Bridge Canyon power plant necessarily be the only source of power available for pumping from Lake Havasu into the Granite Reef aqueduct. The only relationship between the three reservoirs as a group and the diversion project appears to be the assumed financial relation in order to provide means for repayment of a large percentage of the reimbursable costs of the diversion project chargeable to irrigation."

Department of the Army

"* * * However, since the central Arizona project is composed of individual units and interrelated groups of units which are not mutually interdependent for adequate functioning, it is believed that action on certain of these units and groups need not be delayed pending settlement of legal and economic questions for the project as a whole but that they may properly be considered on their own merits as separate units or groups of related units."

"The Corps of Engineers is now studying a group of related units included in the central Arizona project. These units consist of improvements in the Safford Valley, the Buttes Dam and power plant, the Charleston Dam, and the Tucson water supply aqueduct. This group is urgently needed and does not depend on importation of Colorado River water or on subsidization by Colorado River power. This group will be reported upon separately by this Department at a later date."

FEASIBILITY OF PROJECT

Comments of the Department of the Army, the Department of Agriculture, and the Federal Power Commission with respect to certain engineering and economic aspects of the project are quoted as follows:

Department of the Army

"The legal and economic premises upon which the project as a whole is based appear to be open to serious question, particularly with respect to water rights and to the analysis of the economics of the works."

Department of Agriculture

"The first and most important question that must be asked about any proposed public work is, Will the total benefits produced equal or exceed the total costs? Our first concern then, was to find out if the central Arizona project would satisfy this requirement. Frankly, we were unable to determine from your report whether or not the benefits actually would exceed the costs. In the estimation of benefits, gross, rather than net, crop values have been used in the calculation of irrigation benefits. You will recall that in commenting upon previous reports prepared by the Bureau of Reclamation, we have pointed out that this procedure disregards the cost of producing the crops. In the present report, it is indicated that this cost of production is assumed to equal the indirect benefits accruing to the project. But, in our opinion, this is not a valid way of estimating indirect benefits. In this connection, we want to make it clear that we are not questioning the propriety of utilizing indirect benefits in justifying the project, but merely pointing out that an incorrect procedure has been used in estimating these benefits.

"The actual relation of benefits to costs is still further obscured by what appears to be a failure to use the market value of power in estimating, for evaluation purposes, the cost of pumping the water supply. Market value must be used in economic evaluation because the power has alternative uses. (This does not mean, of course, that market value must be used in fixing rates to be charged for water—an operation separate and apart from economic evaluation.) Here again it is to be understood that we are pointing out a procedural error; not questioning the estimates of construction cost.

"In at least the respects mentioned above, the benefits and costs used in testing the economic soundness of the project are in error. We would recommend, therefore, that further and more careful consideration be given to the economic evaluation of the proposed irrigation project. It is not possible to predict the

effect that the suggested procedural changes might have on the benefit-cost ratios set out in the report.

"* * * Sound economics and common sense require, first, the consideration of possible alternatives; and, second, the choice of that alternative yielding the largest return on the investment. We presume that the Bureau of Reclamation has given consideration to various alternative solutions for the water problems of the central Arizona area. This leads us to suggest that these be briefly reviewed in the report so that the Congress and the public will be assured that optimum returns will result from the investment of the public funds required."

Federal Power Commission

"It is observed that the burden of irrigation costs on power would be considerable and that costs of commercial power would be approaching a level that cannot be classed as low-cost power in the region. This raises the question of whether subsidies for irrigation should not be looked for from sources other than power if the irrigation features of the project are adopted.

"The staff is not prepared at this time to comment on the justification for the proposed allocation of $60,715,000 of the cost of the Bridge Canyon, Bluff, and Coconino Reservoirs to silt control, recreation, and fish and wildlife conservation. It is pointed out, however, that this cost, which would be nonreimbursable and which includes about $36,000,000 allocated to recreation, amounts to more than 25 percent of the estimated cost of these reservoirs."

ADEQUACY OF PROJECT PLANS

Comments of the Federal Power Commission and the Department of Agriculture with respect to the adequacy of the proposed plans of the project to carry out proposed functions over the proposed life of repayment are quoted as follows:

Federal Power Commission

"The Commission staff believes that the Glen Canyon Reservoir project on the Colorado River upstream from the Bridge Canyon site should be initiated very soon after the Bridge Canyon Reservoir is constructed. This will be necessary to prolong the period of usefulness of the storage capacity at Bridge Canyon which would otherwise probably be entirely filled with silt in from 40 to 50 years, even with the Bluff and Coconino Reservoirs constructed with the capacities proposed in the report. Bluff and Coconino Reservoirs, being off the main stream, would be of no assistance in reregulating the depleted flows from the upper basin above the confluence of the San Juan River, to meet the 10-year average requirements under the Colorado River compact. Without major upstream storage on the main Colorado River, such as at the Glen Canyon site. as the Bridge Canyon active storage capacity is gradually reduced by silt deposits, this project and the firm power available therefrom, would become more sensitive to upper basin depletions and withholdings of water in headwater storage, and would gradually assume the character of a run-of-river plant. The Glen Canyon Reservoir would obviate the necessity of the Bluff Reservoir, insofar as silt storage is concerned, or at least would defer the necessity of Bluff."

Department of Agriculture

"The contemplated reservoirs will be rendered useless by sediment within a comparatively few years if nothing is done to reduce erosion. It seems clear from the foregoing that the proposed central Arizona project must be supported by projects and activities not contemplated in the report; in particular, by upper basin reservoirs and a program of land treatment."

GENERAL JUSTIFICATION

COMMENTS OF THE BUREAU OF THE BUDGET

The concluding comments of the Bureau of the Budget with respect to the proposed project are as follows:

Bureau of the Budget

"From an examination of the report, of the comments of the affected States, and of the remarks of other interested Federal agencies, it is apparent that there are a number of important questions and unresolved issues connected with the proposed central Arizona project. The provision of adequate water supply, if found to be available, is admittedly a high-cost venture which is justified in the

report essentially on the basis of an urgent need to eliminate the threat of a serious disruption of the area's economy. Even so, the life of certain major parts of the project is appreciably less than the recommended 78-year pay-out period. The work could be authorized only with a modification of existing law or as an exception thereto. Furthermore, there is no assurance that there will exist the 'extremely important element' of a substantial quantity of Colorado River water available for diversion to central Arizona for irrigation and other purposes.

"The foregoing summary and the project report have been reviewed by the President. He has instructed me to advise you that authorization of the improvement is not in accord with his program at this time and that he again recommends that measures be taken to bring about prompt settlement of the water-rights controversy."

SHERIDAN DOWNEY.

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