
CVP COST ALLOCATION STUDY

DRAFT REPORT

January 2001

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LIST OF ACRONYMS AND ABBREVIATIONS

AJE	alternative justifiable expenditure
Bay-Delta Plan	1994 Delta Water Quality Control Plan
CIP	Construction-In-Progress
COA	Coordinated Operations Agreement
COE	U.S. Army Corps of Engineers
Commissioner	Commissioner of Reclamation
Coordination Act	Fish and Wildlife Coordination Act of 1934
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
D-1485	State Water Resources Control Board Decision 1485
Delta	Sacramento-San Joaquin River/San Francisco Bay Delta
DMC	Delta-Mendota Canal
DOE	Department of Energy
ESA	Endangered Species Act
GAO	General Accounting Office
IDC	interest during construction
M&I	municipal and industrial
O&M	Operations and Maintenance
Reclamation	U.S. Bureau of Reclamation
SCRB	separable cost-remaining benefits
Secretary	Secretary of the Interior
Service	U.S. Fish and Wildlife Service.
SOD	safety of dams
State	State of California
SWP	California State Water Project
SWRCB	State Water Resources Control Board
Western	Western Area Power Administration

EXECUTIVE SUMMARY

The Central Valley Project (CVP) is a multi-purpose water resources project operated by the Bureau of Reclamation (Reclamation) that supplies water to more than 250 long-term water contractors in the Central Valley, the San Francisco Bay Area, and the Santa Clara Valley. It also generates sufficient hydroelectric power to operate the project and to supply power to numerous preference power customers in California. In addition to water supply and power, the project has been authorized by Congress through a series of legislative acts to serve flood control, fish and wildlife, recreation, navigation, and water quality protection needs.

Like many major water resources projects designed and operated to serve multiple purposes, the CVP is comprised of both single-purpose and multi-purpose facilities. In accordance with project authorization, portions of the costs for CVP facilities are to be reimbursed by project water and power users. Cost allocation is a process to distribute the costs of multi-purpose project facilities among the various purposes served in order to identify responsibilities for repayment of reimbursable costs. Reimbursable costs require some level of repayment from project beneficiaries whereas non-reimbursable costs are borne by the Federal government (i.e., Federal taxpayers).

If all of the purposes in a multi-purpose project were non-reimbursable, no cost allocation would be required, at least for repayment purposes, since no reimbursement would be necessary. In a multi-purpose project, such as the CVP, with reimbursable costs for one or more purposes, a cost allocation is necessary to determine the level of reimbursement responsibilities. In a multi-purpose project, the costs of a single-purpose facility can simply be assigned to that purpose for reimbursement. The central challenge of the allocation process is the

equitable allocation of joint costs – the costs of facilities serving more than one project purpose.

In the case of the CVP, an initial cost allocation was completed while the project was in the early stages of construction. Since that time, several updated and revised cost allocations have been developed as more and more actual construction costs have been incurred. The last detailed CVP cost allocation was completed in 1975, and the percentages developed in that study for allocating costs among purposes served are still in use today. The allocations were based on the separable costs-remaining benefits (SCRB) method, which considers benefits accruing to each project purpose and has been accepted for use by Federal water resources agencies. Since 1975, relatively minor updates and adjustments have been made annually to the CVP cost allocation to determine repayment responsibilities of water and power users as new project facilities have been added and water and power uses changed. All cost allocations to date are considered interim because construction of the CVP is not considered complete.

Purpose and Need for This Study

The present study was undertaken to comply with the requirements of Public Law 99-546, dated October 27, 1986, and to respond to a recommendation in the General Accounting Office (GAO) report titled *Central Valley Project Cost Allocation Overdue and New Method Needed*, dated March 1992. The latter called for a more streamlined method to allocate joint costs of the CVP. This report describes the existing allocation of CVP costs and its historical basis, considers alternative methods to allocate costs, and recommends a preferred alternative.

Public outreach in support of this study began shortly after the study was initiated and continued through development and evaluation of alternatives considered in this report. An additional public meeting will be held during the review period of this draft report to support the issuance of the final report.

Alternatives Development

In the course of this study, two alternative cost allocation methods were developed and compared to the Existing Allocation. A Proportional Alternative was developed based on a suggestion from the GAO, and a Contractors' Proposal was developed from a proposal received from CVP water and power contractors.

For the Existing Allocation and the two alternatives, costs were allocated to project purposes and repayment responsibilities were calculated for the reimbursable functions – municipal and industrial (M&I) water users, irrigation water users, and commercial power customers. Evaluation of the alternatives required development of study-specific evaluation criteria because the circumstances involved in this cost allocation study differ from those typically encountered in cost allocation studies, which are conducted during project planning and development. At the start of project planning, no allocation exists, and the problem is that of developing one, including choice of the appropriate allocation method. For this study, an allocation does exist so that the relevant question is whether one or both of the alternative allocation methods have characteristics that provide a compelling reason to change the existing method. The evaluation criteria applied in this study were formulated to address that question, and if the answer were affirmative for both alternatives, to provide guidance in the selection of one of them as the recommended method. The criteria were applied to determine whether the alternatives met the basic requirements for an interim cost allocation and to highlight differences between the existing allocation method and the alternatives.

The Proportional Alternative

The Proportional Alternative would allocate joint costs in proportion to specific costs – the costs of individual physical features that serve only a single project purpose. This approach, which is similar to an accounting method that distributes overhead costs among various units, does not consider the level of benefits generated by joint-use facilities when allocating their costs.

This study found that implementation of the Proportional Alternative would constitute a significant departure from benefits-based allocation methods that have been used by Federal water resources agencies for nearly half a century. In addition, the Proportional Alternative is not well suited to accept future additions of single-purpose project facilities because the costs of these features, which are specific costs, would affect the allocation of joint costs of existing facilities. This would occur even if the new facility resulted in no change in those project benefits that stemmed from the joint facilities.

The Contractors' Proposal

The Contractors' Proposal, as interpreted by Reclamation, is based on the existing cost allocation but contains two significant components that would alter the allocation and repayment of CVP costs. First, the factors used to allocate joint costs are based on results from the 1970 reallocation study rather than results from the 1975 study. Second, the proposal attempts to account for the environmental re-operation of the CVP by creating a new environmental water use for the determination of repayment responsibilities of costs allocated to the water supply purpose.

The use of the 1970 joint cost allocation factors in place of the 1975 factors would significantly affect the allocation of joint costs to the power and flood control purposes. In the 1975 study, the power factor increased to 21.8 percent from 5.9 percent in 1970 while the flood control factor fell to 20.5 percent from 35.5 percent in 1970. The contractors proposed

this change claiming that the cost of the single-purpose power alternative in 1975 study was biased by high energy costs at the time and that flood control benefits were understated because previous Corps of Engineers (COE) flood control benefit estimates were not indexed to then-current levels in the 1975 study. This study reviewed these claims and found that high energy costs were symptomatic of the period and that the COE recommendation (that flood control benefits not be indexed because there were other offsetting characteristics of the method being applied) appears to have been reasonable. Of course, it is not known with certainty if the power and flood control benefits from 1970 are more accurate today or over the years between 1975 and today than the benefits developed for these purposes in 1975. An updated estimate of project benefits for all project purposes would be required to make such a determination. Even after such a determination were made, however, questions regarding the integration of the results with past flood control and power benefits, past allocations, and past repayments would remain.

The Contractors' Proposal maintains that the authorized purposes of the CVP have been greatly expanded and that the project has undergone significant re-operation since completion of the 1975 reallocation study. The accomplishments of the project have been altered dramatically as a result of legislation and policy decisions including the CVPIA, Endangered Species Act, and the 1994 Delta Water Quality Control Plan. According to the proposal, the existing allocation method does not adequately reflect the significant new environmental benefits that have been generated by the re-operation of the project and the associated enhancement and mitigation activities that have occurred. Also, the existing allocation method does not reflect the reduction in benefits accruing to water and power users.

The environmental water use account in the Contractors' Proposal would be based on the 800,000 acre-feet of water dedicated annually by section 3406(b)(2) of the Central Valley Project Improvement Act (CVPIA) for the primary purpose of implementing the fish, wildlife, and restoration purposes of the Act. For purposes of

determining repayment responsibilities for costs allocated to water supply, this authorized use of existing water would be treated as an additional CVP water supply in the proposal. The Contractors' Proposal provides a formula – derived from repayment requirements specified for many of the actions mandated in section 3406(b)(4)-(23) of the CVPIA – that would treat 37.5 percent of the costs associated with the environmental water account as reimbursable by water and power users and the remaining 62.5 percent as non-reimbursable. This cost sharing arrangement would be tantamount to treating 37.5 percent of the environmental water as mitigation water and the remaining 62.5 percent as enhancement water.

This study found the addition of an environmental water use account to be insupportable for a number of reasons. First, unlike other provisions of the CVPIA wherein cost sharing arrangements and surcharges on water and power users have been specified, Congress neither directed that a new cost allocation study be undertaken as a result of likely reductions in water contract deliveries nor provided a cost allocation formula related to the 800,000 acre-feet of dedicated water. Second, section 3406(b)(2) of the CVPIA did not state that any of the dedicated water is for environmental enhancement. Furthermore, section 3406(b)(3) of the CVPIA required implementation of a program to supplement the quantity of water dedicated in section 3406(b)(2). This indicates that the CVPIA did not contemplate that the dedicated water would meet all the environmental goals enumerated in section 3406(b)(2). Mitigation, protection, and restoration must precede enhancement, and it is unlikely that the 800,000 acre-feet alone could completely mitigate, protect, and restore, and therefore that any portion of it could be considered enhancement.

Third, the three water supply functions in the Existing Allocation are all end uses – M&I users, irrigators, and wildlife refuges. The “environment,” on the other hand, as used in the Contractors' Proposal, is not an end use in the same sense that M&I, irrigation, and

wildlife refuges are end uses. Environmental water released from CVP reservoirs for instream environmental benefits could also be used downstream for other beneficial purposes, including irrigation or M&I uses, farther downstream. In such cases, the Contractors' Proposal would double count the use of water.

Fourth, underlying the Contractors' Proposal are the assertions that form the basis for proposing the environment as a water use, namely, that the authorized purposes of the CVP have been greatly expanded and that the CVPIA established the environment as a new project purpose. Fish and wildlife considerations, however, have long been a responsibility of water projects developed by Reclamation and other Federal agencies as a result of the Fish and Wildlife Coordination Act and its various amendments. The original act, passed in 1934, required that projects impounding water consider use of project water for fish culture and migratory bird habitat, and provision of fish passage past dams. The 1946 amendment to the act required that agencies impounding or diverting water consult with the Service with the view to preventing loss of and damage to wildlife resources, and that consistent with the primary project purposes, provide for conservation, maintenance, and management of fish and wildlife and their habitats. In recognizing the importance of fish and wildlife resources and increasing public interest, the 1958 amendment provided that wildlife conservation should receive equal consideration and be coordinated with other project features through effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation.

Authorizations of components of the CVP and reauthorizations of the entire CVP have also addressed consideration of fish and wildlife and their habitats. These include authorization to use CVP water supplies to develop and maintain waterfowl management areas. Authorizations to add the Trinity River Division, the New Melones Project, and the San Felipe Division included provisions to preserve and propagate fish and wildlife resources.

Finally, both Federal legislation, including the CVPIA, and State Water Resources Control Board (SWRCB) decisions require the CVP to meet certain environmental conditions as an operational priority. Decisions of the SWRCB, which are implicitly reinforced by the language of the CVPIA that "Nothing in this title shall affect the State's authority to condition water rights permits for the Central Valley Project," have made it clear that all CVP water rights are junior to inbasin needs, including needs within the Delta itself, and that the CVP can only export water from the Delta that is surplus to inbasin needs. In other words, not only are fish and wildlife purposes not new to the CVP, but, as a matter of State law, CVP water rights have always been junior in priority to such environmental requirements. In short, the introduction into the CVP cost allocation of an environmental water account proposed by the water and power contractors is not consistent with provisions of Federal law, Reclamation guidance on allocating costs, State water rights decisions, and would likely double count water use.

Seen in this context, the CVPIA reinforced the obligation of the CVP to protect the environment by re-emphasizing the priority of meeting environmental needs, but did not add the environment as a new project purpose.

Conclusions and Recommendations

A summary of the changes in total repayment responsibilities from the Existing Allocation that would result from the two alternatives considered in this study is provided in Table ES-1. Changes in M&I costs associated with the water rate components are shown in Table ES-2, and changes in irrigation costs associated with the water rate components are shown in Table ES-3.

This study concludes that neither the Proportional Alternative nor the Contractors' Proposal includes characteristics that provide compelling reasons to change the existing allocation method. Accordingly, the Existing Allocation is recommended as the preferred allocation alternative.

This study makes two additional recommendations. First, joint costs should continue to be allocated using a benefits-based method. Since 1956, the joint costs of the CVP have been allocated using the SCRIB method, which is a benefits-based method. This method has been accepted as the basis for setting water rates for many decades and is the method established for use by Federal water resources agencies. In addition, the procedure for allocating the costs of existing and new project features has been incorporated into the expectations of water users. Second, Reclamation should consider completing a reallocation of CVP costs based on new estimates of project accomplishments – including water supply, flood control, power, and fish and wildlife – benefits, and costs. It is expected that

such a study would be time consuming and potentially costly. Before such a study were undertaken, an evaluation should be completed to identify what existing data are available for use, what new data would be required, the levels of effort needed to develop new data and perform the analyses required for a new cost allocation study, and how present benefits and costs would be integrated with former estimates of benefits and costs and contractor repayment. This evaluation would include coordination with other agencies that would be expected to provide input to a new allocation study – such as the COE and Fish and Wildlife Service – to determine their ability and willingness to participate in it.

TABLE ES-1
CHANGES IN TOTAL REPAYMENT RESPONSIBILITIES
(\$ MILLION)

Repayment Entity	Plant-In-Service Total Cost In Existing Allocation	Change in Total Cost As Compared to Existing Allocation	
		Proportional Alternative	Contractors' Proposal
M&I Water Users	436.5	-1.0	-1.9
Irrigation Water Users	1,476.2	27.6	-32.8
Commercial Power Customers	568.8	12.3	-35.8
State of California and Local Governments	244.5	0.6	-0.2
Federal Non- reimbursable	564.1	-39.4	70.7
TOTAL	3,290.2	0.0	0.0
Notes:			
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.			
Totals may not be completely accurate due to rounding.			

TABLE ES-2
CHANGES IN M&I WATER RATE COMPONENTS
(\$ MILLION)

Rate Component	Existing Allocation	Change As Compared to Existing Allocation	
		Proportional Alternative	Contractors' Proposal
Storage	75.6	-4.2	-2.3
Conveyance	286.4	0.0	-0.4
Conveyance Pumping	3.1	0.0	-0.1
Direct Pumping	39.2	0.0	0.0
Other	8.3	2.9	2.0
Project Use Power	17.5	0.3	-1.0
San Luis Drain	0	0.0	0.0
Subtotal Used in Setting Rates	430.2	-1.0	-1.9
Repayment Contracts for Distribution Systems	6.4	0.0	0.0
TOTAL	436.5	-1.0	-1.9
Notes:			
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.			
Totals may not be completely accurate due to rounding.			

TABLE ES-3
CHANGES IN IRRIGATION WATER RATE COMPONENTS
(\$ MILLION)

Rate Component	Existing Allocation	Change As Compared to Existing Allocation	
		Proportional Alternative	Contractors' Proposal
Storage	341.5	42.3	-14.2
Conveyance	471.3	-25.7	-12.3
Conveyance Pumping	45.6	0.0	-1.7
Direct Pumping	107.0	0.0	0.0
Other	40.4	8.6	4.4
Project Use Power	109.5	2.4	-8.9
San Luis Drain	46.5	0.0	0.0
Subtotal Used in Setting Rates	1,161.8	27.6	-32.8
Repayment Contracts for Distribution Systems	314.4	0.0	0.0
TOTAL	1,476.2	27.6	-32.8
Notes:			
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.			
Totals may not be completely accurate due to rounding.			

Chapter I

INTRODUCTION

Cost allocation is a process to distribute the costs of multi-purpose project facilities among the various purposes served in order to identify responsibilities for repayment of reimbursable costs. Reimbursable costs are costs that require some level of repayment from project beneficiaries. These can be contrasted with non-reimbursable costs, which are costs borne by the Federal government (i.e., Federal taxpayers). Generally, cost allocation is first performed during project planning before construction begins to give contractors an estimate of their repayment responsibility and to determine whether the project is financially feasible. In the case of the CVP, an initial allocation was completed while the project was in the early stages of construction. Since that time, several updated and revised cost allocations have been developed as more and more actual construction costs have been incurred. In addition, numerous laws have been enacted, agreements made, and policies established to guide the allocation of costs among CVP purposes and to assign repayment responsibilities for reimbursable costs to water and power users and other non-Federal entities.

The last detailed CVP cost allocation study was completed in 1975, and the percentages developed in that study for allocating costs among purposes served are still in use today. Since then, relatively minor updates and adjustments have been made annually to the cost allocation to determine repayment responsibilities of water and power users as new project facilities have been added and water and power uses changed.

This report describes the existing allocation of CVP costs and its historical basis, considers alternative methods to allocate costs, and selects a recommended alternative. This study was undertaken to comply with the requirements of Public Law 99-546, dated October 27, 1986, and to respond to recommendations presented in the GAO report titled *Central Valley Project Cost Allocation Overdue and New Method Needed*, dated March

1992.

The remainder of this chapter provides background for this CVP cost allocation study, Chapter II summarizes past CVP cost allocation studies, Chapter III describes the existing CVP cost allocation, Chapter IV discusses cost allocation methods and presents two alternatives to the existing allocation, Chapter V contains numerical results of cost allocations using the existing and two alternative allocation methods, Chapter VI presents evaluation criteria and results of comparative evaluations of the three allocation methods, and Chapter VII contains conclusions and recommendations.

BACKGROUND

The CVP is the largest surface water storage and delivery system in California and is also the largest irrigation water supply project constructed and operated by Reclamation. Facilities and service areas of the CVP cover a large geographic area and include 35 of the State's 58 counties. The CVP includes 20 reservoirs, with a combined storage capacity of approximately 11 million acre feet; 8 powerplants and 2 pumping-generating plants, with a combined capacity of approximately 2 million kilowatts; 2 pumping plants; and approximately 500 miles of major canals and aqueducts. The CVP supplies water to more than 250 long-term water contractors in the Central Valley, the San Francisco Bay Area, and the Santa Clara Valley.

The CVP is authorized as a financially and operationally integrated water supply project, providing water storage both north and south of the Sacramento-San Joaquin River/San Francisco Bay Delta (Delta). As shown on Figure I-1, major CVP dams and reservoirs are located on the Trinity, Sacramento, American, Stanislaus, and San Joaquin rivers. CVP water supplies north of the Delta are controlled by Shasta and Folsom dams on the

Sacramento and American rivers, respectively. Water from the Trinity River is stored, re-regulated, and diverted through a system of dams, reservoirs, tunnels, and powerplants to the Sacramento River to supplement the supply developed by Shasta Reservoir.

Hydroelectric power generation at numerous CVP facilities provides adequate power for project requirements (project use power) and additional power is available for commercial sale. Commercial power generated by CVP facilities is marketed and sold by the Western Area Power Administration (Western), an agency of the Department of Energy.

Total long-term contracts for CVP water exceed 9 million acre-feet per year. Historically, approximately 90 percent of the water delivered by the CVP has been for agricultural uses. At present, increasing quantities of water is being provided to municipal customers, including the cities of Redding, Sacramento, Folsom, Tracy, and Fresno, most of Santa Clara County, and the northeastern portion of Contra Costa County.

The CVP was authorized through a series of legislative acts, beginning with the Rivers and Harbors Act of 1935, which authorized construction of initial features on the Sacramento and San Joaquin Rivers and in the Delta by the COE. The River and Harbors Act of August 26, 1937, reauthorized the CVP for construction under provisions of Federal reclamation laws by the Secretary of the Interior (Secretary). Successive Congressional acts authorized additional facilities, and, in most cases, groups of facilities were authorized as Divisions or Units (components of a division) based on geographical proximity and purposes served.

The first allocation of costs and assessment of financial feasibility for the CVP was completed in 1946. In 1954, the COE, the Federal Power Commission, and the Department of the Interior agreed to use the separable costs-remaining benefits (SCRB) method as the preferred approach for the allocation of project costs. (The SCRB allocation method is explained in Chapter IV.) In 1956, Reclamation completed its first reallocation of CVP costs based on the SCRB method. This allocation was revised in 1960 and again in 1970, when

updated SCRB analyses were completed. In 1975, a “short-form” reallocation of CVP costs was prepared using updated benefits and indexed costs for some project purposes to revise the 1970 allocation. No major reallocation of CVP costs has been completed since 1975.

To date, the allocation studies of the CVP have provided “interim” results because construction of the CVP is not yet considered complete. Capital costs continue to be incurred for new facilities and for replacements and additions to existing facilities. Consequently, a final cost allocation cannot be completed at this time.

Each year, Reclamation prepares an update to the interim cost allocation of the CVP for plant-in-service, operations and maintenance (O&M), construction work-in-progress, and the authorized project. The updates utilize factors developed in the 1975 reallocation study. The annual plant-in-service update provides input to Reclamation’s water ratesetting process, Western’s commercial power ratesetting process, Reclamation’s and Western’s financial statements, Reclamation’s Statement of Project Construction Cost and Repayment, and Western’s Power Repayment Study. In addition, Reclamation prepares an allocation of CVP operation and maintenance (O&M) costs annually that also provides input to Reclamation’s water ratesetting process.

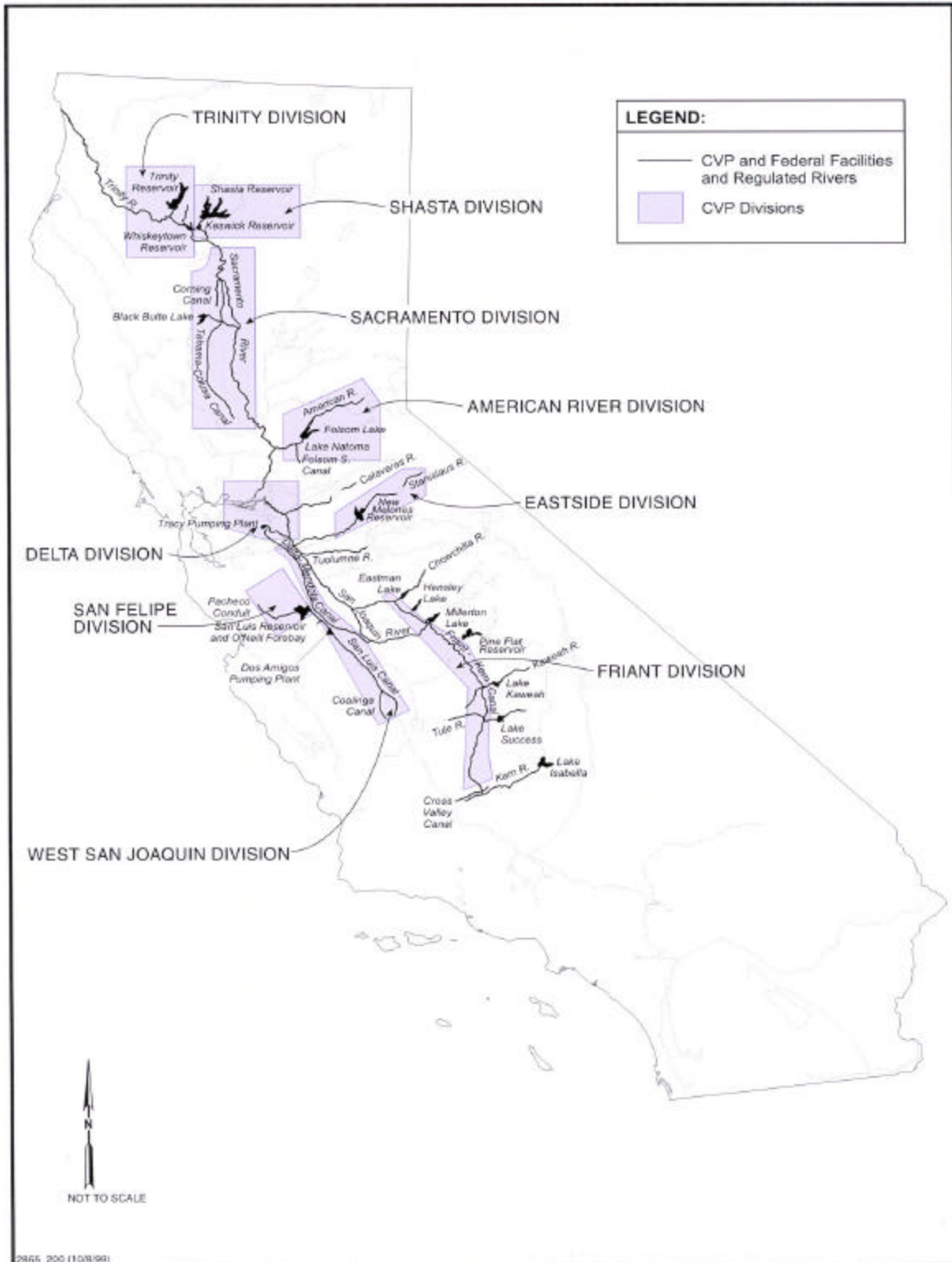


FIGURE I-1
THE CENTRAL VALLEY PROJECT

NEED FOR COST ALLOCATIONS

Early Federal efforts in the field of water resources development consisted of simple, single-purpose projects, but soon after that the trend was toward increasingly complex, multi-purpose developments. If a project serves only one purpose, its costs can simply be assigned to that purpose, whether or not the purpose is reimbursable. If all of the purposes in a multi-purpose project are non-reimbursable, no cost allocation is required, at least for repayment purposes, since no reimbursement is necessary. In a multi-purpose project, such as the CVP, with one or more purposes that must reimburse costs, a cost allocation is necessary to determine the level of reimbursement responsibilities.

Like many major water resources projects designed and operated to serve multiple purposes, the CVP is comprised of both single-purpose and multi-purpose components. Costs for single-purpose facilities, such as canals to provide M&I water and irrigation water, are, of course, allocated to the purposes they serve for repayment in accordance with legislation, agreements, and policies. Costs of multi-purpose facilities, such as dams and reservoirs that may be designed and operated to provide water supply, flood control, and other benefits, must be allocated to the multiple purposes served. Costs incurred for some purposes are completely or partially reimbursable while costs incurred for other purposes are completely non-reimbursable. Thus, the central challenge of the allocation process is the equitable allocation of joint costs – the costs of facilities serving more than one project purpose.

Since repayment requirements are established by law and agency policies, some of which are project-specific, the cost allocation process is often project-specific and can require substantial detail. Any allocation process relies to some extent on judgment, and the goal is the development of an apportionment of joint costs that complies with Federal laws and regulations, agency cost allocation and contracting policies, and is perceived as acceptable to all parties. In the CVP, the cost allocation process is used to distribute project costs among its seven authorized purposes and to identify repayment responsibilities for reimbursable costs. The cost allocation identifies costs to be repaid to

the Federal government by water and power users as well as the repayment obligations of non-Federal public entities, such as the State of California (State) and counties. The allocation also identifies non-reimbursable costs, borne by Federal taxpayers.

NEED FOR A REVISED COST

Authorized Purposes of the CVP

- Water Supply
- Hydroelectric Power Generation
- Flood Control
- Fish and Wildlife Protection, Restoration and Enhancement
- Recreation
- Navigation
- Water Quality

Repayment Entities

- Irrigation Water Users
- Municipal and Industrial Water Users
- Commercial Power Customers
- State of California and Counties

ALLOCATION OF THE CVP

Since the last cost reallocation study completed in 1975, two events have occurred that direct Reclamation to conduct a new CVP cost allocation study. Title I of P.L. 99-546 directed the Secretary to operate the CVP in conformity with State water quality standards for the Delta. That law also required that the costs associated with providing CVP water supplies for the purpose of salinity control and for complying with State water quality standards of the Coordinated Operations Agreement be allocated among the project purposes and reimbursed in accordance with existing Reclamation law and policy. The Secretary was authorized and directed to undertake a cost allocation study of the CVP and implement it no later than January 1, 1988. Reclamation completed a draft cost allocation study in 1988, but it was never implemented.

In 1992, the GAO submitted a report titled *Central Valley Project Cost Allocation Overdue and*

New Method Needed, dated March 1992, on the CVP cost allocation to the Chairman of the Congressional Subcommittee on Water, Power and Offshore Energy Resources. According to the report, the analysis in the 1988 draft allocation study included inappropriate costs, was based on questionable estimates of project benefits and alternative costs, and required information that was not always available or was costly and time-consuming to obtain. The GAO recommended that the process used to complete the allocation study be streamlined by using less costly and more timely methodologies and suggested two approaches to allocate joint costs that differ from the SCRB procedure. In a response to the GAO recommendation that was published as part of the GAO report, Reclamation indicated that it was working expeditiously to complete the new interim cost allocation study and would examine one approach suggested by the GAO. It would allocate joint costs in direct proportion to specific costs and compare the results to joint costs allocated using the benefits-based method. This would allow Reclamation to assess the results of both methods and determine which methodology is more appropriate for use in allocating costs for the CVP.

SCOPE OF STUDY

The objectives of this cost allocation study were established based on issues raised by the GAO in its 1992 report and other concerns raised by Reclamation staff in recent years. Study objectives include:

- Consider the use of a simplified method to allocate joint costs
- Develop a streamlined process for completing annual updates to the CVP cost allocation
- Identify and correct discrepancies in the allocation or repayment computations to assure compliance with legislation, agreements, and policies
- Consider the need for a new, comprehensive cost reallocation study

In planning this cost allocation study,

Reclamation decided not to develop an entirely new allocation with new allocation factors based on updated estimates of project benefits or alternative costs. Updating water and power operations studies, re-estimating project benefits, re-designing project features and re-estimating their costs in today's dollars would require a significant investment in time and effort and would not be consistent with the GAO recommendation for a more streamlined allocation process. Before making such an investment, it would be prudent to consider the need for it and to consider whether it would likely result in a more acceptable allocation of costs. Accordingly, this study was limited to the level of effort needed to identify and correct discrepancies in the computations, revise computational tools, and to consider alternative allocation methods that would not require a new application of the SCRB method to complete.

As noted above, although Reclamation annually updates four different types of CVP cost allocations, only the plant-in-service allocation and O&M cost allocation are used in the water ratesetting process. Furthermore, the O&M allocation itself is generally based on the plant-in-service allocation. From a functional standpoint then, the plant-in-service allocation is the most crucial of the four and is the only one addressed in this study.

PUBLIC OUTREACH

Public outreach began shortly after the study was initiated and included a presentation of the existing cost allocation process. Outreach continued through development and evaluation of alternatives considered in this report. A summary of public meetings and workshops held during development of this draft report is provided in Table I-1.

A public meeting will be held during the review of the Draft Report to provide clarification and solicit comments from the public. The Final Report will include responses to comments received on the Draft Report.

TABLE I-1
SUMMARY OF PUBLIC MEETINGS AND WORKSHOPS

DATE	PURPOSE
February 4, 1999	<ul style="list-style-type: none"> • Provided Overview of the Cost Allocation Study • Described Methodology Used in Existing Cost Allocation • Described Corrections Applied to 1995 Cost Allocation • Discussed Potential Strategies for Development of Alternatives
March 10, 1999	<ul style="list-style-type: none"> • Provided Examples of Existing Allocation Computations • Described Allocation Methods Suggested by the GAO
April 23, 1999	<ul style="list-style-type: none"> • Reviewed GAO Recommendations • Presented Initial Results from Analysis of GAO-Suggested Method
May 20, 1999	<ul style="list-style-type: none"> • Presented Further Results from Analysis of GAO-Suggested Method
July 15, 1999	<ul style="list-style-type: none"> • Presented Revised Results from Analysis of GAO-Suggested Method • Solicited Input on Other Possible Allocation Alternatives to be Considered • Water and Power Contractors Requested Opportunity to Present Alternative for Consideration
February 8, 2000	<ul style="list-style-type: none"> • Presented Summary and Results of Three Allocation Alternatives (Existing Allocation, Proportional Alternative, Contractors' Proposal) • Solicited Input on Criteria to Evaluate and Compare Alternatives
June 15, 2000	<ul style="list-style-type: none"> • Summarized Allocation Alternatives Under Consideration • Presented Evaluation Criteria to be Applied to Alternatives

Chapter II

SUMMARY OF CVP COST ALLOCATION STUDIES

The allocation of CVP costs is used to establish repayment requirements for various project functions. Annual updates adjust the allocation as changes in the uses of project-supplied water and power occur and as new investments in facilities are completed. These updates are required each year to provide input to the CVP water ratesetting process performed by Reclamation and the power ratesetting process performed by Western. An allocation for the fully “authorized CVP,” which includes facilities that have been authorized by Congress and may be constructed in the future, also accompanies annual appropriations requests that are submitted to Congress with the Reclamation’s budget. Cost allocations are also used to establish bases for financial feasibility studies when proposals are made for new additions to the project.

ANNUAL COST ALLOCATION UPDATES

As noted in Chapter I, Reclamation updates several types of cost allocations each year to support a variety of administrative requirements.

The plant-in-service cost allocation is updated to reflect changes in the total capital investment for in-service facilities during the most recent fiscal year and changes resulting from legislation or policy determinations. A similar update is made for the O&M cost allocation to reflect changes in the annual costs to operate and maintain the CVP. Calculations of repayment responsibilities for allocated plant-in-service and O&M costs are based on periodic updates of historic and projected water deliveries and power generation and use for each water use function. Shifts in repayment responsibilities can change gradually in response to long-term trends in water supply uses. For example, if the total of historic and projected M&I water use increases as irrigation use decreases, the repayment responsibilities for reimbursable water supply costs

would tend to shift from irrigation customers to M&I customers. Upon completion of the repayment analysis, changes in the repayment responsibilities of M&I water, irrigation water, and commercial power customers are used in the water and power ratesetting processes performed by Reclamation and Western.

The construction work-in-progress cost allocation provides information on the allocation of costs associated with facilities under construction. Repayment of these costs does not occur until the facilities have been put into service and the costs are recorded on the plant-in-service allocation. The cost allocation of the authorized CVP reflects the allocation of all costs for the entire project as authorized. Costs for facilities on which construction has not been started or completed are shown as estimates that are subject to revision.

As noted in Chapter I, this study addresses only the plant-in-service allocation for the CVP. The recommended allocation method, however, will also be used to complete the construction work-in-progress cost allocation. The allocation of the authorized CVP uses percentages derived from the plant-in-service allocation so that it too will be based on the recommended allocation method. The O&M allocation deals with the annual costs of operating the project and includes categories of costs that are not directly associated with project facilities, such as the hazardous materials management program. Annual costs directly associated with project facilities are allocated in the same proportion as the plant-in-service costs so that the allocation of these costs will also be based on the recommended allocation method.

PREVIOUS CVP COST ALLOCATION STUDIES

Significant allocation studies prepared for the CVP since its inception are summarized in the following sections.

Initial Central Valley Project Studies

During the early to mid-1940s, Reclamation employed many specialists from other Federal, State, and local agencies, the private sector, and academia to address 24 specific problems relating to the CVP. Problem 8 addressed the allocation of project costs to power and irrigation while Problem 9 addressed allocations to navigation, flood control, salinity repulsion, and national security.

Problems 8 and 9 were assigned to a group of investigators drawn from a broad cross-section of Federal and State agencies, the University of California, local planning agencies, and agricultural water users. The committee first applied four different allocation methods – the benefit method, proportionate use method, the vendibility theory, and the alternative justifiable expenditure (AJE) method – and combined the result to produce an allocation of CVP costs that it submitted to Dr. Harlan H. Barrows, Director of Central Valley Project Studies, by letter of June 10, 1946. (The AJE allocation method is discussed in Chapter IV.) Not all members of the group concurred with the recommendation and some issued minority statements. The cost allocation results presented in that report received no official sanction and were never used in project repayment analyses, but they undoubtedly set the stage for subsequent studies.

1946 Cost Allocation Study

Reclamation prepared its own report in 1946 on the allocation of costs and financial feasibility of the CVP. The study was prepared pursuant to section 7(b) of the Reclamation Project Act of 1939, which authorized the Secretary of the Interior to make allocations of costs in accordance with provisions of section 9 thereof.

In the 1946 cost allocation study, Reclamation utilized two methods – AJE and use of facilities – and averaged the results. According to *Document No. 146, 80th Congress, 1st Session*, in which the

allocation was published, the AJE and use of facilities were the two methods for which a reasonable claim to validity existed for application to the CVP. That the two methods produced results with few differences was accepted as proof of the approximate validity of each. Since it was thought that there was no sure way to choose between them, the final result was taken as an average of the two.

1956 Reallocation Study

At the national level, the issue of the appropriate allocation method for use in Federal water resources projects was the subject of several investigations in the early 1950s. The Federal Inter-Agency River Basin Committee represented the COE, the Departments of the Interior, Agriculture, and Commerce, and the Federal Power Commission. In May 1950 its Subcommittee on Benefits and Costs submitted a report entitled *Proposed Practices for Economic Analysis of River Basin Projects*, commonly known as the *Green Book*, in which it recommended the SCRB method for general use in allocating costs on Federal multi-purpose river basin projects. This recommendation, however, was not immediately adopted by the participating agencies.

The Subcommittee on Civil Works of the House Committee on Public Works investigated cost allocations for Federal water projects and in December 1952 issued its report entitled the *Allocation of Costs of Federal Water Resource Development Projects* which was published as *House Committee Print No. 23, 82nd Congress, 2nd Session*. The report did not recommend use of a specific method by all agencies but did state that the Subcommittee was “favorably impressed” by the SCRB method. The subcommittee did recommend that the Bureau of the Budget be designated as the agency to approve cost allocations made for Federal water projects, but the recommendation was not adopted.

On April 6, 1954, the COE, the Federal Power Commission, and the Department of the Interior announced that they would all consistently employ the same approach for cost allocations. The SCRB was considered preferable, but the AJE and use of facilities methods would also be permitted under special circumstances. The Commissioner

subsequently issued implementing instructions stating that SCRIB was the preferred method and that other methods would be permitted only in exceptional cases. This policy was restated in Reclamation Instructions and remains in effect today through the Reclamation Manual. The Mid-Pacific Region of Reclamation completed its first reallocation of CVP costs by this method in 1956, but some questions regarding its application remained.

Although the same allocation method had been adopted by Federal water resources agencies, differences emerged in its application. For example, the COE allocated costs to a water conservation purpose (i.e., water supply) as part of the SCRIB study, then sub-allocated that amount between the end functions of irrigation and M&I service. Reclamation at that time allocated directly to the purposes without the sub-allocation process. Also, a question lingered as to whether power should first be allocated as a total amount and then sub-allocated between project use power (i.e., that used for pumping M&I, irrigation, and wildlife refuge water) and commercial power – as was the practice in some Reclamation regions – or be allocated directly to the end functions. Little guidance was available within Reclamation and no coordination of such matters existed among Federal departments.

1960 Reallocation Study

Between 1956 and 1959, CVP cost allocation changes were limited to annual adjustments to project cost estimates. Although project costs did not change significantly, several updates to input data were available, making a new reallocation study necessary. Most notably, a recently completed hydrologic study by Reclamation provided updated estimates of water supply and power accomplishments of the project. In addition, the COE had provided updated estimates of flood damage reduction and navigation benefits of the CVP. These revised estimates resulted in changes in project benefits that could not be reflected without a reallocation of the costs of the entire project.

San Luis Unit costs were not included in the 1960 reallocation because the study was nearly completed at the time San Luis was authorized. It was decided that costs for the San Luis Unit should

be allocated separately and treated as an addition.

1970 Reallocation Study

During the 1960s, many changes occurred which showed that some of the accomplishments of the project were not in accord with the 1960 estimates. Various adjustments were made in the interim to account for the changes, but by 1968 the effect of the adjustments had reached a level of significance that the need to re-evaluate the cost allocation in its entirety was evident. In response a proposal from the Regional Director, the Commissioner instructed the Mid-Pacific Region to proceed with a cost reallocation within the framework of existing authorizations.

The 1970 reallocation study was completed in six steps applying to different parts of the project and shown in Table II-1, each of which was completed separately and summed to derive the allocation for the total project. This approach was adopted in recognition of the effects that various authorizations had on the construction and operation of the overall project. The 1970 allocation addressed the authorized CVP and so included costs estimates for facilities that had been authorized by Congress but not yet constructed. Costs for many of the facilities were allocated using the SCRIB method. However, with the exception of the Los Banos Creek Detention Dam, which was allocated using the SCRIB method, the San Luis Unit was allocated using the proportionate use method for the delivery of water for irrigation and M&I uses. Costs for COE facilities that had been transferred to and/or financially integrated into the CVP were allocated by the COE. The six steps used in the 1970 reallocation study are summarized in Table II-1.

Within the framework of the 1970 reallocation study, several issues emerged that were resolved at a meeting in Washington, DC, during the week of October 21, 1968. The specific issues considered in the 1970 reallocation study and their resolutions are summarized in Table II-2.

ASSUMPTIONS AND CRITERIA EMPLOYED IN THE 1960 COST REALLOCATION STUDY

NEW DATA USED IN THE STUDY

- A recently completed hydrologic operation study provided the basis for the estimated water and power accomplishments.
- Flood control and navigation benefits were based on revised estimates provided by the COE that reflected recent information on flood frequencies and magnitudes, and river traffic and freight rates.

ANALYTICAL ASSUMPTIONS

- The SCRB method was used.
- Project costs were allocated in total rather than feature by feature.
- Construction and O&M costs were combined and allocated concurrently.
- The period of analysis was extended to 100 years from the 50-year period commonly used in previous studies.
- Direct benefits were used for all project purposes except irrigation, which was credited with both direct and indirect benefits.
- Specific costs incurred for either minimum basic recreational facilities or mitigation of fish and wildlife damages were assigned directly to the functions involved.
- All costs were indexed to July 1959 price levels and the cost allocation was performed on the indexed amount. Costs assigned to project purposes were then adjusted downward proportionate to the relationship between the actual project cost and the indexed July 1959 level. This approach was necessary because actual project costs had been incurred over a long period of time at many price bases while all single-purpose and remaining project alternative costs were at the July 1959 level. Indexing of actual costs to the same base as the alternatives was necessary to maintain comparability. The downward adjustment after completion of the allocation returned the indexed costs to their actual amounts.
- All future project benefits and costs were converted to present-worth values over a 100-year period, with an annual interest rate of 2-1/2 percent.
- The single-purpose commercial power alternative assumed privately financed steam-electric construction.
- Commercial power and M&I water benefits were measured as equivalent to their alternative costs.

TABLE II-1
SUMMARY OF 1970 REALLOCATION STUDY

STEP	FACILITIES	ALLOCATION METHOD	DISCUSSION
Base I	CVP features through the Trinity River Division	SCRB	Recorded costs were indexed to the then-current levels to be comparable with estimates for various alternatives, which were used in the SCR method. Upon completion of the initial allocation, indexed costs were converted back to their actual levels.
Base II	San Luis Unit	Proportional Use SCRB	With the exception of the Los Banos Detention Dam, the costs of the San Luis Unit were allocated by the proportionate use method, based on prior direction from the Commissioner. The proportionate use method had been used in the studies that supported authorization of the San Luis Unit. Los Banos Detention Dam was allocated separately using the SCR method because a flood control purpose is included with this facility and no common use denominator was available for the proportionate use method.
Base III	Auburn-Folsom South Unit	SCRB	Allocation of costs for the Auburn-Folsom South Unit was completed in three parts. Auburn Dam and Folsom South Canal were allocated together using the SCR method. This combination was considered to be essential because much of the water supply for Folsom South Canal would be supplied from Auburn Reservoir. The Foresthill Divide and Folsom-Malby sub-units were allocated separately because of their independence from the remainder of the Auburn-Folsom South Unit. The SCR method was used in allocating the cost of each of these sub-units. The results from the three parts were combined.
Base IV	COE Projects	Unknown	Used allocated costs provided by COE.
Base V	San Felipe Division	SCRB	All facilities allocated using SCR method.
Base VI	Black Butte Dam and Reservoir	Unknown	Used allocated costs provided by COE.

TABLE II-2

SIGNIFICANT ISSUES ADDRESSED IN THE 1970 REALLOCATION STUDY

ISSUE	RESOLUTION
Water supply allocation with sub-allocation to irrigation, M&I, and waterfowl conservation functions	In previous CVP cost allocations, water supply costs had been directly allocated to end-use functions. The 1970 reallocation adopted an allocation to water supply with sub-allocations to water use functions based on proportionate water deliveries to each function. This approach was adopted so that adjustments for future changes in project accomplishments could be more readily accommodated.
Power total allocation with sub-allocation to commercial power and the project use functions of irrigation, M&I, and waterfowl conservation	Similar to the decision on water supply sub-allocation, it was determined that a total power allocation with costs sub-allocated to commercial and project use functions was preferable. It was decided that total power costs should be sub-allocated in proportion to costs of separate alternative projects for both commercial and project use that would provide power equivalent to that of the multipurpose project. The project use share was further sub-allocated among irrigation, M&I, and waterfowl in proportion to the amounts of energy used by each.
Allocations to recreation and fish and wildlife purposes	After consideration of the difficulties in directly allocating costs to these two purposes, it was decided to combine recreation and fish and wildlife into a single purpose. After allocation to the combined purpose, sub-allocations were made to the separate purposes proportionate to benefits accruing to each.
Flood Control and Navigation	The COE re-evaluated flood control and navigation accomplishments of the CVP and provided revised benefits by letter of April 25, 1969.
Use of COE allocation studies for project units authorized for construction by the COE	The New Melones, Hidden, Buchanan, and Marysville projects were authorized for construction by the COE, but with differing provisions for their integration with the CVP upon completion. It was decided that the cost estimates and allocations made by the COE should be incorporated in the CVP cost allocation.
Interest Rate	The then-current interest rate of 3-1/4 percent was used in the allocation. It was recognized that many of the features of the CVP were built when other interest rates prevailed, but attempts to use a series of rates would unduly complicate the study and probably add little to its accuracy.
Allocation of joint costs for the San Luis Unit to the recreation purpose	<p>The 1955 feasibility report for the San Luis Unit included minimal recreational development estimated at about \$90,000. This amount was indexed upward to \$100,000 during 1960 congressional hearings for authorization. The San Luis authorization provided for joint development with the State. A joint project was developed, and recreation facilities were greatly expanded. Reclamation participated to the extent of approximately \$3 million in sharing specific costs of these facilities.</p> <p>A question emerged regarding the propriety of allocating a share of the joint costs for the San Luis Unit to recreation. It was agreed that the authorization did not provide for allocation of joint costs on a non-reimbursable basis. The Mid-Pacific Region was directed to allocate only specific costs to recreation in the San Luis Unit.</p>
Use of Federally financed single-purpose alternatives in the cost allocation	It was reaffirmed that the single-purpose alternative for all purposes should be based on the same period of analysis and financed in the same manner as the multi-purpose project.

1975 Reallocation Study

A “short form” reallocation of CVP costs was prepared in 1975. It too was an allocation of the authorized CVP. The shortcut approach utilized some information prepared for the 1970 study, adjusted and updated other information, and developed completely new information for still other purposes. The 1975 study did utilize revised benefits, including those for power, navigation, and fish and wildlife, which were provided by other Federal agencies. All other benefits were re-evaluated by the Mid-Pacific Regional Office. The 1975 study did not include re-evaluation of hydrologic operations or resizing and re-costing of alternatives.

Water supply benefits were not re-evaluated since it was assumed they would exceed the cost of a single-purpose alternative. Power benefits were re-evaluated based on energy and capacity dollar values for nuclear powerplants as provided by the Federal Power Commission. Fish and wildlife benefits were re-evaluated by the Fish and Wildlife Service (Service), and the COE provided a new evaluation of navigation benefits but recommended using the flood control benefit values it supplied for the 1970 reallocation study. The present worth of the stream of annual flood control benefits did increase somewhat because of a decline in the interest rate used by Reclamation to perform the present worth computations. Recreation benefits were not re-evaluated, and at that time water quality was not considered a project purpose to which costs were allocated.

Prior to commencing the 1975 study, representatives from the regional and Washington offices met to discuss and agree on the criteria to be used. The meeting was held in Washington on February 13-14, 1975, and culminated in re-confirmation of most of the decisions reached at a similar meeting preceding the 1970 reallocation study and described in Table II-2 pertaining to special problems and techniques to be used in application of the SCRB method. No major departures from the previous approaches were recommended.

These early decisions were important since they set the stage for several decades of Reclamation

practice, including decisions to allocate to water supply first, then sub-allocate to M&I, irrigation, and fish and wildlife water supply and a precedent that different cost allocation methods could be applied to different groups of facilities in such a large project, with different facilities built at different periods of time.

CONGRESSIONAL ACTIONS THAT AFFECT ALLOCATIONS AND REPAYMENT

Historical relationships between project authorizations and expenditures have linked cost allocations and repayment with Congressional actions since passage of the Reclamation Act of 1902. When the primary features of the CVP were authorized and constructed in the 1940s through the 1960s, the focus of Congressional actions was on authorization of project features. During the past two decades, however, the focus of Congress has shifted toward corrective actions to address environmental problems associated with the CVP.

For several of the corrective actions, Congress specified repayment obligations. With the exception of the Fish and Wildlife Coordination Act, all of the following Congressional actions that affect CVP cost allocations and repayment have occurred since 1975.

Fish and Wildlife Coordination Act Requirements

The Fish and Wildlife Coordination Act (Coordination Act), enacted in 1934 and amended in 1946, 1958, and 1965, directs Federal agencies to coordinate their activities with the Service in the development of projects that may affect biological resources. The act recognizes that the construction and operation of water resources projects affect environmental resources, with the potential to create harm or to enhance existing conditions. The act contains provisions for the repayment of costs associated with environmental mitigation and enhancement. While costs for environmental enhancement are considered non-reimbursable Federal expenditures, repayment obligations for mitigation costs have changed over time.

In the 1934 act, mitigation costs were considered reimbursable and were included in the project repayment obligations for water and power users. The 1946 amendment to the act, passed shortly before major construction of the CVP was undertaken, stated that mitigation costs were henceforth considered non-reimbursable Federal expenditures. However, the 1965 amendment, enacted prior to construction of the San Luis Unit and San Felipe Division of the CVP, repealed the non-reimbursability provision for fish and wildlife mitigation costs. In the allocation of CVP costs, the construction date of features that require fish and wildlife mitigation is used to determine whether such costs are reimbursable or non-reimbursable in accordance with the various amendments to the act.

Congressional Approval of Cost Allocations

The Department of Energy Organization Act, dated August 4, 1977, authorized establishment of the Department of Energy (DOE) and transferred all power marketing functions from Reclamation to that agency. Section 302(a)(3) of that Act provided that no “changes in any cost allocation or project evaluation standards shall be deemed to authorize the reallocation of joint costs of multipurpose facilities theretofore allocated unless and to the extent that such change is hereafter approved by Congress.”

By letter of March 13, 1978, the Regional Solicitor advised the Regional Director that allocation revisions made pursuant to the Mid-Pacific Region Supplement to Reclamation Instructions dated March 10, 1975, would not be effective unless they were approved by Congress. The Solicitor also advised by a second letter dated April 13, 1978, that the allocation adjustments prepared annually for budget appropriation hearings were not affected by the provisions of the act. Since a detailed reallocation of CVP costs completed after 1977 could significantly affect the allocation of joint costs, it is likely that Congressional approval of some form would be necessary.

Trinity River Mitigation and Restoration Activities

The Trinity River Division was authorized by Public Law 84-386, dated August 12, 1955. Section 2 of that act authorized and directed the Secretary to

adopt appropriate measures to insure the preservation and propagation of fish and wildlife. Costs incurred for fish and wildlife purposes pursuant to this act were considered non-reimbursable Federal expenditures in accordance with the Coordination Act of 1946.

Following completion of original project elements in the Trinity River Division, additional features were authorized as part of the Trinity River Restoration Program. Work was performed under the authority of Public Law 96-335, dated September 4, 1980, and Public Law 98-541, dated October 24, 1984, for the purposes of stream rectification and fish and wildlife restoration in the Trinity River Basin.

Stream rectification costs incurred in accordance with the 1980 act were subject to a 50-50 cost sharing requirement between the State and Federal governments, with Federal construction costs limited to \$3.5 million subject to indexing as appropriate. Fish and wildlife restoration costs incurred in accordance with the 1984 act were allocated 50 percent as reimbursable expenditures, 35 percent as non-reimbursable Federal expenditures, and 15 percent to the State and Humboldt and Trinity Counties.

Therefore, for the Trinity River Division, the authorization governing expenditures on fish and wildlife mitigation costs determines the reimbursement and cost-share requirements among water and power users, and Federal, State, and local governments.

Coordinated Operations Agreement and Suisun Marsh Preservation Agreement

In 1986, Reclamation and the State entered into a Coordinated Operations Agreement (COA) that described how the CVP and the California State Water Project (SWP) are to be operated in a coordinated manner to jointly meet Delta salinity control and water quality standards as defined by SWRCB. The COA included many provisions concerning the joint operations of CVP and SWP, including methods to ensure that water demands in specific areas north of the Delta and in the Delta are met prior to exporting water to areas south of the Delta. In addition, COA provisions defined how

much water the CVP and the SWP can export when the Delta conditions allow exports.

Title I of P.L. 99-546 directed the Secretary to operate the CVP in conformity with State water quality standards for the Delta. The act specified that costs associated with providing CVP water supplies for salinity control and to comply with State water quality standards be allocated among project purposes and reimbursed in accordance with existing Reclamation law and policy. Title I also authorized and directed the Secretary to undertake a cost allocation study of the CVP and to implement such allocations no later than January 1, 1988.

Title II of the act, The Suisun Marsh Preservation Agreement, authorized Reclamation to execute and implement that agreement including construction of a number of Suisun Marsh preservation facilities and set a cost ceiling on the Federal contribution. The act also required Reclamation to allocate these costs among the reimbursable and non-reimbursable purposes served by the project. Suisun Marsh preservation facilities have been constructed and their costs allocated as directed by Title II.

As noted in Chapter I, Reclamation undertook and completed a draft cost allocation study of the CVP in 1988 to comply with the requirements of Title I, but the draft allocation was never implemented.

General Accounting Office Report

As discussed in Chapter I, the GAO in 1992 submitted a report to Congress on the CVP cost allocation, together with its finding that the draft CVP cost allocation study prepared in 1988 included inappropriate costs, was based on highly questionable data, and required data that were unavailable or difficult to obtain. It suggested two alternative approaches to cost allocation intended to simplify the process and provide a more representative allocation of costs among current project beneficiaries.

One method would allocate joint costs in proportion to specific costs. Under this method, joint costs would be allocated in direct proportion to the specific costs assigned to each project purpose.

For example, if specific costs associated with irrigation were 80 percent of all specific project costs, then irrigation would receive 80 percent of the joint costs. In concept, this method is similar to an allocation of overhead costs among multiple products within a business.

The second method suggested in the GAO report would allocate joint costs on the basis of use. For example, if 20 percent of the water in a reservoir is used for M&I purposes while 80 percent is used for irrigation, then 20 percent of the costs of the dam and reservoir would be allocated to M&I purposes and 80 percent to irrigation. To apply this method, a uniform unit of measurement, such as acre-feet of water supply, is needed. Because CVP dams and reservoirs provide flood control, power generation, navigation, fish and wildlife, recreation and water quality benefits in addition to water supply benefits, it is not possible to develop a common unit of measurement. Therefore, this method is not considered applicable for the allocation of CVP costs.

Central Valley Project Improvement Act

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575) that included Title XXXIV, the CVPIA. The CVPIA amended the Act of August 26, 1937, the basic authorizing legislation for the CVP, to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic uses and fish and wildlife enhancement as a project purpose equal to power generation.

The CVPIA identified a number of specific measures to meet these new purposes. It also directed the Secretary to operate the CVP consistent with these purposes, to meet the Federal trust responsibilities to protect the fishery resources of affected Federally-recognized Indian tribes, to meet all requirements of Federal and State law, and to achieve a reasonable balance among competing demands for CVP water.

Many of the provisions included in the CVPIA identified specific measures intended to improve fishery conditions in Central Valley rivers and the

Delta. In many cases, the provisions also provided specific cost sharing and allocation criteria. As a result, the allocation of costs for CVPIA-mandated actions was directed by Congress, with Congress specifying the percentage of costs to be allocated to water and power users, the Federal government, and the State. Relevant examples are the actions specified in section 3406(b)(4)-(23) and refuge water supplies addressed in section 3406(d).

On the other hand, the CVPIA contained requirements that could affect CVP water availability and use without directing that a new cost allocation be undertaken or providing a cost allocation formula. Section 3406(b)(2) of the CVPIA directed the Secretary to dedicate and manage 800,000 acre-feet of CVP yield for the primary purpose of implementing the fish, wildlife, and restoration purposes of the act, to assist the State in its efforts to protect Bay/Delta waters, and to help meet other legally imposed obligations on the CVP, including but not limited to additional obligations under the Federal Endangered Species Act. The dedication of this water would be expected to reduce the capability of the CVP to deliver contracted for amounts of water to M&I and irrigation contractors. Congress neither

directed that a new cost allocation study be undertaken as a result of likely reductions in water contract deliveries nor provided a cost allocation formula related to the dedicated water.

In summary, throughout the life of the CVP, the allocation of its costs has been affected directly or indirectly by Federal legislation, continuing up to the recent specific allocation of costs of certain actions and facilities mandated by the CVPIA. This has meant that different rules may apply to different groups of CVP facilities or facilities built during different periods of time.

Once the SCRB allocation method was adopted by Reclamation in 1954, it has been applied to most project facilities in the recurring allocation studies of the CVP. Exceptions for certain groups of facilities, such as the San Luis Unit, have been made where the facilities in question are single-purpose in nature and an allocation using the SCRB method is unnecessary.

The current CVP cost allocation study must be understood in the context of these changing mandates and application of different procedures to different sets of CVP facilities. It is also important to note that the existing CVP water ratesetting process, dependent as it is on the allocation of CVP costs, has relied on this amalgamation of practices.

Chapter III

EXISTING CVP PLANT-IN-SERVICE COST ALLOCATION

As an initial step in conducting this CVP cost allocation study, Mid-Pacific Region staff of Reclamation reviewed and revised the 1995 annual interim update to the allocation of plant-in-service costs (the most recent completed at the time). The review, which was made to assure compliance with authorizing legislation, regulatory requirements, interagency agreements, and/or policy guidelines revealed several deficiencies that had been part of previous annual updates, and data that had been introduced into the 1995 interim allocation. The types of deficiencies identified and corrected included arithmetic errors in some computations, inconsistent rounding of computed values, incomplete allocation of some costs, and the use of allocation criteria that were inconsistent with authorizing legislation, regulatory requirements, and/or policy guidelines.

In November 1998 prior to the first public meeting on the cost allocation study that was held in February 1999, Reclamation provided a three-volume documentation of the CVP cost allocation to agency staff, stakeholders, and interested parties. The first volume presented allocation factors and repayment responsibilities for plant-in-service costs listed in the CVP financial statement on a feature-by-feature basis. For each feature, this volume described any adjustments to costs reported in the financial statement that are needed prior to the allocation computations, the authorization of and allocation criteria applied to each feature, and the repayment criteria used to determine reimbursable costs allocated to the water supply, power, fish and wildlife, and recreation purposes. The second and third volumes of the documentation comprised a compendium of reference materials regarding authorizations, agreements, and agency policies on issues affecting cost allocation and repayment. Subsequently, the 1996 and 1997 plant-in-service interim cost allocations were based on intermediate versions of the revisions that were available for

application in these annual updates. Beginning in 1998, annual cost allocation updates have been based on the results of the revisions made at this step.

As a part of the study, a revised and expanded computer spreadsheet was developed to improve the speed with which cost allocation updates can be completed. The spreadsheet uses standardized computations to allocate costs and calculate repayment responsibilities for each feature in the CVP. Beginning in 1996, interim cost allocation updates have been completed in a matter of weeks rather than over a period of months, which had typically been required prior to the improvements.

COST ALLOCATION COMPUTATIONAL PROCESS

A three-step process is followed in the allocation of CVP costs.

- Identify costs to be allocated.
- Allocate costs to project purposes.
- Calculate repayment responsibilities for each project purpose.

The following discussions provide general descriptions of these three steps.

Identify Costs to be Allocated

As described in Chapter II, the CVP was authorized at different times through various pieces of legislation and includes facilities constructed by Reclamation and other facilities constructed by the COE that have been transferred to Reclamation for repayment. In addition, certain facilities constructed by Reclamation, while still operated as an integral part of the CVP, have been transferred from Reclamation to DOE.

The Department of Energy Organization Act of 1977, establishing DOE, transferred the power marketing functions of Reclamation, including the construction, operation, and maintenance of transmission lines, to the new department. Western was created within DOE and exercises the power marketing functions for the CVP. The plant-in-service costs of CVP transmission lines were subsequently transferred to Western and no longer appear in Schedule No.1 (Plant, Property and Equipment) of the CVP financial statement.

The CVP financial statement reflects costs of facilities that can be broadly grouped into the six categories described below. Costs of facilities transferred to Western are included as a seventh category.

Single-Purpose Facilities – These are features of the project that serve a single purpose, such as canals and pumping plants (water supply purpose), powerplants and switchyards (power purpose), fish facilities (fish and wildlife purpose), and recreation facilities (recreation purpose). The allocation of single-purpose facilities is simple, with costs assigned to the single purpose the facility serves.

Some of the single-purpose facilities listed in the CVP financial statement are local water distribution systems serving both M&I and irrigation water users that are being repaid through repayment contracts with the United States. A repayment contract specifies a fixed obligation that is to be repaid through a fixed number of installments and is similar in nature to a home mortgage. These facilities are included in the CVP cost allocation because Reclamation is responsible for collections under provisions of the repayment contracts. Their costs are allocated to the water supply purpose and then set aside in a separate repayment contract category. Since these costs are recovered through repayment contracts, they are not included in water or power rates.

Multi-Purpose Facilities – These are features of the CVP that serve multiple purposes, such as dams and reservoirs. A number of CVP dams and reservoirs provide flood control benefits and/or store water for both hydroelectric power generation and water supply. Other multi-purpose facilities include

radio, telemetry, and other communications equipment, rain and stream gages, permanent operating facilities, and protective measures in Suisun Marsh to control salinity water conditions.

Since 1956, the costs for multi-purpose features of the CVP have generally been allocated among the purposes served by each facility using the SCRB method.

The existing cost allocation uses factors that were calculated in the 1975 reallocation study. These factors identify the portion of costs for each multi-purpose facility that are specific to individual purposes (separable factors) and the proportional allocation of remaining joint costs among multiple purposes (joint factors).

COE-Transferred Facilities – The CVP includes three facilities listed below that were constructed by the COE and transferred to Reclamation for operational and financial integration with the CVP. They appear in Schedule No.1 of the CVP financial statement. Folsom Dam was constructed by the COE, transferred to Reclamation, and integrated into the CVP; Reclamation has developed allocation factors for Folsom Dam as part of its own cost allocation studies. Reclamation has adopted the COE cost allocation for the other two facilities and collects for repayment accordingly. Each year the COE provides a letter to Reclamation that presents the current-year allocation of costs for the two facilities.

- Folsom Dam and Reservoir
- New Melones Dam, Powerplant, and Reservoir
- Black Butte Dam and Reservoir

In addition, Reclamation, through the CVP, has assumed the repayment obligation for two other facilities constructed and operated by the COE. The two facilities are listed below. Reclamation has also adopted the COE allocation for these facilities and collects for repayment accordingly. Each year the COE provides a letter to Reclamation that presents the current-year allocation of costs for the two facilities.

- Hidden Dam and Hensley Lake
- Buchanan Dam and Eastman Lake

Non-Reimbursable Costs – The plant-in-service costs of a number of CVP facilities include components directly set aside to a non-reimbursable category pursuant to Congressional legislation. In the CVP allocation these component costs are directly assigned to the appropriate category and are removed from the allocation base. The non-reimbursable costs are as follows:

- Federal share of Safety of Dams improvements
- Archeology, cultural, and historical
- Highway improvement
- Non-reimbursable Interest During Construction
- Capitalized movable equipment
- Buildings and service facilities

Authorized Deferred Use – Public Law 89-161, dated September 2, 1965, authorized the Auburn-Folsom South unit and allowed the Secretary to include additional capacity in the Folsom South Canal to deliver water to potential future additions to the CVP along the east side of the Central Valley. Public Law 90-65, dated August 19, 1967, authorized the Secretary to include extra capacity in the Tehama-Colusa Canal to enable it to provide future water service to areas that could be authorized as an extension of the CVP. In both cases the incremental costs of the additional canal capacity were to be assigned to deferred use. These costs would become the repayment responsibility of water users if and when facilities that formed the basis for the deferral are ever constructed.

State Share of San Luis Unit – Public Law 86-488, dated June 3 1960, authorized the Secretary to construct, operate, and maintain the San Luis Unit as an integral part of the CVP. Certain facilities, including San Luis Dam, pumping plants, and the

San Luis Canal, were to be jointly used with the State and are known as joint-use facilities. Contract No. 14-06-200-9755, dated December 30, 1961, provides that the State shall pay 55 percent of the construction cost of joint-use facilities and the Federal government 45 percent. In the allocation of CVP costs, the State share of the construction costs of joint-use facilities is directly assigned to the State and removed from the allocation base.

Western Facilities – Facilities owned and operated by Western are the Central Valley Power System and Interties Power System. They are single-purpose power facilities, and plant-in-service costs are derived from Western’s annual Results of Operations for both systems.

Allocate Costs to Project Purposes

Starting with each year’s financial statement, cost allocation computations are completed in several steps to assure that cost components are identified and allocated in accordance with existing legislation, agreements, and policies. First, costs reported in the financial statement are disaggregated, as necessary. The total costs of many features reported in the financial statement include cost components that are to be directly assigned to a non-reimbursable expense category or are subject to allocation and repayment criteria that differ from those of the main feature.

For example, the total cost of a feature reported in the financial statement may include non-reimbursable costs associated with archaeological, cultural, and historical studies. These costs are identified and assigned directly to the appropriate non-reimbursable cost category. In other cases, total costs in the financial statement include interest during construction (IDC), safety of dams improvements, or other items that are not subject to the same cost allocation and repayment criteria as the main feature. In general, the repayment requirements of these components have been specified by Congressional legislation. The costs are identified and allocated separately. Such adjustments may be based on specified dollar amounts or percentages of total costs incurred.

After completing the adjustments described above, the remaining costs represent the total capital

investment to be allocated among the authorized project purposes of the CVP. For single-purpose facilities, costs are allocated in total to the purpose served. Subsequent computations, described in a later section, distribute allocated costs for determination of repayment responsibilities.

For multi-purpose facilities, costs are allocated using separable and joint cost allocation factors. In the existing cost allocation, these factors are based on the results of the 1975 reallocation study, which was completed using the SCRB method. First, separable cost factors are applied to identify the portion of total costs allocated among project purposes as separable costs. (Separable costs are discussed in Chapter IV.) The remaining costs are then allocated among multiple purposes using the joint cost allocation factors. The total allocation to each project purpose is the sum of separable costs and that portion of joint costs allocated to the purpose.

Calculate Repayment Responsibilities

Repayment responsibilities for costs allocated to each project purpose are determined separately for each purpose. Depending on the facility, costs allocated to water supply, power, fish and wildlife, and recreation purposes are either fully or partly reimbursable by the project beneficiaries. Costs allocated to flood control, navigation, and water quality are non-reimbursable Federal expenditures. In general, the costs of constructing CVP facilities are initially paid by the Federal government (Reclamation) with funds appropriated by Congress. Reimbursable costs are the costs that will be repaid to the Federal government by M&I and irrigation water users, commercial power customers, the State, and counties within the State. In the context of this study, the term “reimbursable” generally applies to costs to be repaid by water and power customers. Non-reimbursable costs are the construction costs that will not be repaid to the Federal government; in effect, they are borne by the Federal taxpayer. A brief description of the repayment analysis to determine reimbursable costs follows.

Water Supply Repayment – Costs allocated to the water supply purpose are sub-allocated among the M&I, irrigation, and wildlife refuge water use

functions in proportion to their respective water deliveries. More specifically, costs are distributed using factors based on the type of facility used (storage, conveyance, conveyance pumping, or direct pumping) in proportion to the amount of water stored, conveyed, or distributed for each function. In order to appropriately reflect use of such facilities, proportional use is based on the total of actual historic and projected future water deliveries for both water users and wetland habitat areas. For any given allocation update, actual water delivery records begin with the first CVP water deliveries and continue through the year two years prior to the year of the update. Projected water deliveries extend from that date through the end of the repayment period (2030 for in-basin facilities, and 2036 for San Felipe Division facilities) and assume the delivery of full contract amounts or are reduced to reflect possible future reductions in the amount of CVP water available to its contractors. The effect of year-to-year changes in water deliveries on these proportions based on actual use is normally very small due to the long period considered. Consequently, factors used to determine water supply repayment obligations do not vary significantly from year to year.

Costs sub-allocated to the wildlife refuge water supply function are further sub-allocated among reimbursable and non-reimbursable functions based on cost sharing criteria included in the CVPIA. Reimbursable costs are assigned to non-Federal entities (project water and power users and the State) in accordance with legislative requirements. The distribution of that portion of wildlife refuge water supply costs that is reimbursable by project water and power users (M&I water, irrigation water, and commercial power contractors) is made in proportion to the previous year’s costs allocated to the three reimbursable functions of M&I water supply, irrigation water supply, and commercial power.

Power Repayment – Costs allocated to the power purpose are first sub-allocated between project use and commercial power using factors derived from the long-term project power generation and project use power studies prepared by Reclamation with input from the Western. In this distribution, the costs of Western’s Interties Power

System are allocated entirely to the commercial power function. They and other costs allocated to commercial power are collected by Western in the power rates it charges preference power customers.

Costs sub-allocated to project use power are further sub-allocated among the M&I, irrigation, and wildlife refuge water use functions. This sub-allocation is based on estimates of project use power requirements prepared by Reclamation.

Costs for project use power that is used to convey water to wildlife refuges are further sub-allocated among reimbursable and non-reimbursable functions based on cost sharing criteria included in the CVPIA. Similar to what is done for refuge water supply costs, the distribution of reimbursable power costs for refuge water supply among project water and power users (M&I water, irrigation water, and commercial power contractors) is made in proportion to the previous year's costs allocated to the three reimbursable functions.

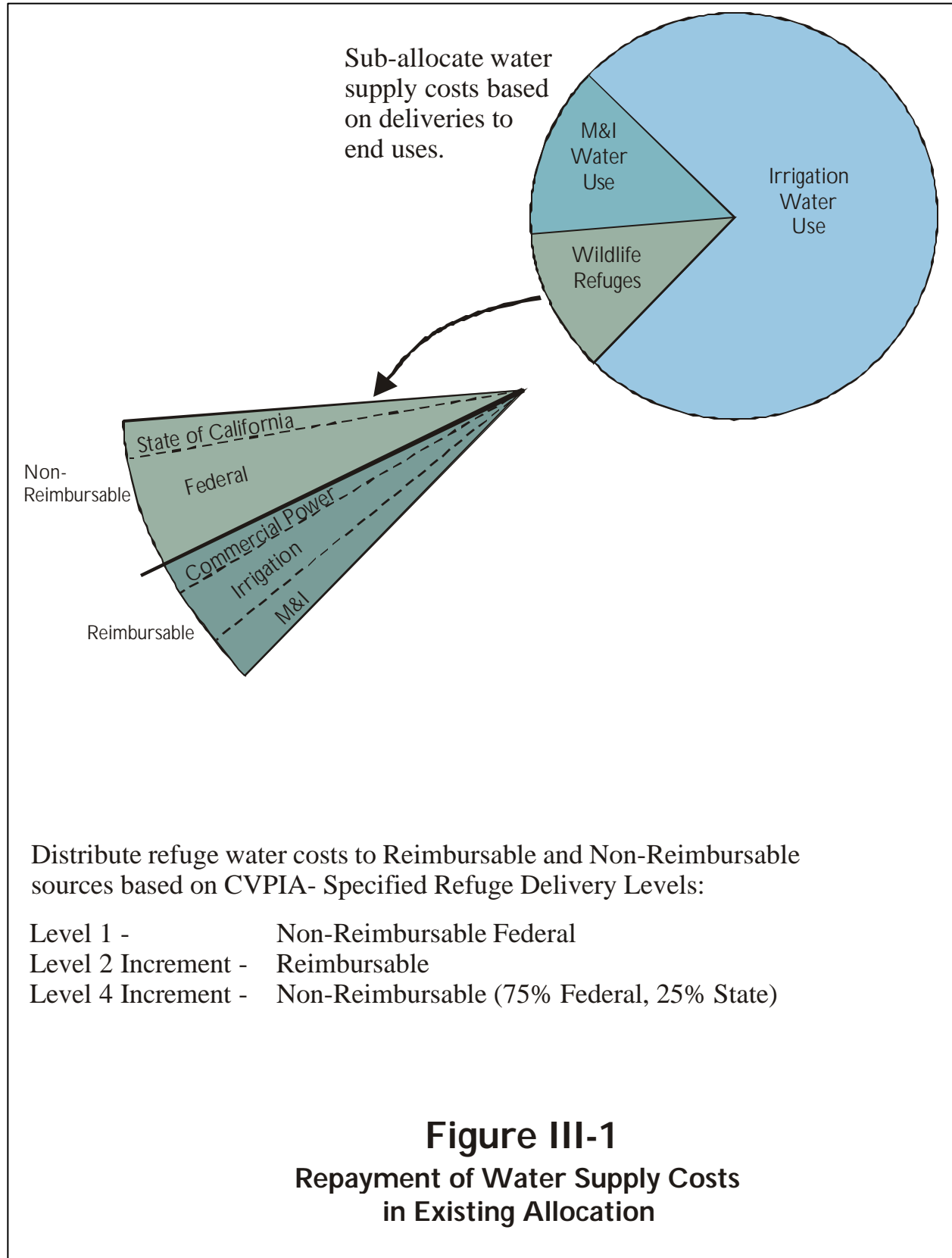
Fish and Wildlife Repayment – The repayment of costs allocated to the fish and wildlife purpose depends whether the actions involved are enhancement or mitigation. Costs incurred for enhancement are entirely non-reimbursable while costs for mitigation may be reimbursable or non-reimbursable. As described in Chapter II, the Coordination Act has been amended several times, and the year in which mitigation costs are incurred is the key factor that determines whether fish and wildlife mitigation costs are reimbursable or non-reimbursable. Reimbursable mitigation costs are assigned to irrigation and M&I water users and commercial power customers in proportion to the current year's costs of the "causal" facility assigned for repayment purposes to these three functions. As an example, the Coleman National Fish Hatchery was built to mitigate losses of anadromous fish spawning areas behind Keswick and Shasta Dams and its costs are assigned to irrigation and M&I water users and commercial power customers in proportion to the current year's costs of Keswick and Shasta Dams allocated to those three functions for repayment. If a particular "causal" facility cannot be identified (i.e., if the facility is for mitigation of project operation in general), costs are distributed in proportion to the previous year's overall project costs allocated to these three

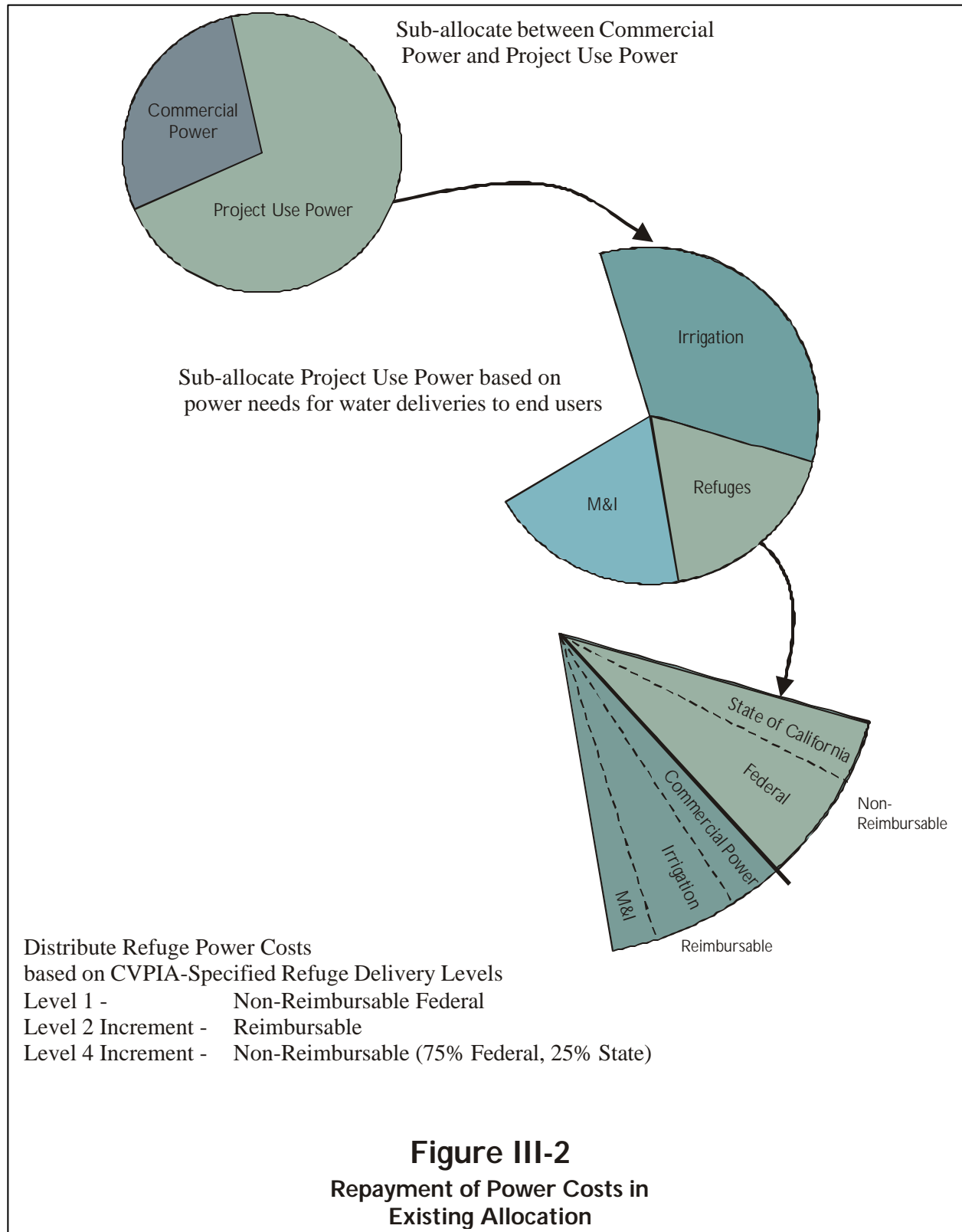
functions for repayment.

Most recently, the cost sharing criteria applied to certain activities designed to mitigate impacts on and restore fish, wildlife, and associated habitats have been Congressionally mandated by the CVPIA.

The costs of many of these activities are partially non-reimbursable and therefore paid by Federal taxpayers while a portion is repaid by the State and a portion repaid by CVP water and power users. The distribution of reimbursable costs among M&I water, irrigation water, and commercial power contractors is made in proportion to the current year's costs of the "causal" facility allocated to these three functions for repayment. In the event a particular "causal" facility cannot be identified, costs are also distributed in proportion to the previous year's overall project costs allocated to these three functions for repayment.

Recreation Repayment – Capital costs allocated to the recreation purpose are repaid according to the legislation authorizing the expenditure. In some cases, recreation facilities have been provided under the authority of the Federal Water Project Recreation Act, dated July 9, 1965, which authorizes construction of recreation facilities as a part of Federal water resources projects. The act also has provisions governing the allocation of costs to recreation and cost sharing with non-Federal entities. Legislation authorizing a number of units and divisions of the CVP has included the construction of recreational facilities and provided that the Federal share of such costs shall be non-reimbursable.





SUMMARY OF EXISTING CVP COST ALLOCATION

To date the total cost of CVP plant-in-service facilities is approximately \$3,290 million (1999 CVP interim cost allocation annual update). This amount represents total non-indexed costs incurred since construction of CVP facilities began. As noted in Chapter I, the central challenge of the allocation process is the allocation of joint costs; these amount to a total of about \$623 million (about 19 percent of total CVP plant-in-service costs).

As described above, the allocation of joint costs is a multi-step process that uses allocation factors developed in the 1975 reallocation study and applies repayment criteria provided in legislation, agreements, and policies. Although the allocation of CVP costs to its authorized purposes may be of interest, the final results of cost allocation computations are generally displayed as repayment responsibilities for reimbursable and non-reimbursable costs. A summary of repayment responsibilities from the 1999 CVP cost allocation is provided in Table III-1.

**TABLE III-1
EXISTING CVP COST ALLOCATION
REPAYMENT RESPONSIBILITIES
AS OF SEPTEMBER 30, 1999**

Repayment Entity	Cost (\$Million)
M&I Water Users	436.5
Irrigation Water Users	1,476.2
Commercial Power Customers	568.8
State of California and Local Governments	244.5
Federal Non-reimbursable	564.1
TOTAL	3,290.2
<p>Notes:</p> <p>Results based on the 1999 CVP Interim Cost Allocation Annual Update.</p> <p>Costs for multi-purpose facilities allocated using factors derived from 1975 reallocation study.</p> <p>Totals may not be completely accurate due to rounding.</p>	

Chapter IV

DEVELOPMENT OF ALTERNATIVES

As discussed in Chapter II, several methods are available to allocate the joint costs of multi-purpose projects. As an initial step in this study, a number of cost allocation methods (discussed in economics and water resources literature) were surveyed and qualitatively evaluated for possible application to the CVP. A summary of these evaluations is included in this chapter. As a result of these evaluations, certain alternatives were selected for numerical evaluation (i.e., allocations using CVP costs were prepared), with the results presented in Chapter V. This chapter provides descriptions of the allocation methods considered in more detail and discusses their applicability for use in allocating CVP costs and their potential application in this study.

CRITERIA FOR DEVELOPMENT OF ALTERNATIVES

The purposes of this allocation study guided the development of alternatives. As stated in Chapter I, the purposes are to comply with the requirement of P.L. 99-546 and to recommend revisions to the existing CVP cost allocation that will result in a streamlined process as suggested by the GAO.

Compliance with P.L. 99-546

The provisions of P.L. 99-546 directed the Secretary to operate the CVP in coordination with the State to meet salinity standards in the Delta. The standards were defined in SWRCB Decision 1485 (D-1485). P.L. 99-546 stated that costs necessary to comply with D-1485 salinity standards in the Delta should be allocated to project purposes and reimbursed in accordance with existing Reclamation law and policy. The law also stated costs necessary to meet salinity standards above those included in D-1485 should be non-reimbursable.

Shortly after passage of P.L. 99-546, Reclamation conducted hydrologic simulations of CVP operations to compare the effects of the COA operations to meet D-1485 standards with a base condition without D-1485 standards. The results of these analyses showed that the CVP could be re-operated to satisfy D-1485 requirements with no reductions in the water deliveries for long-term water service contracts. Based on these results, no additional “cost” would be incurred to comply with the law, and therefore, no change in the allocation of CVP costs was considered necessary.

In 1994, the Federal and State governments signed an accord to jointly operate the CVP and SWP, respectively, to meet the requirements of a more stringent water quality objective, as presented in the 1994 Delta Water Quality Control Plan (Bay-Delta Plan). The agreement stated that the Federal portion of the water to comply with the Bay-Delta Plan would be credited toward the amount of water to be dedicated to anadromous fishery protection under section 3406(b)(2) of the CVPIA.

Recommendations in the GAO Report

In its 1992 report, the GAO recommended the use of less costly and more streamlined methodologies to complete the CVP cost allocation study. As described in Chapter III, Reclamation has implemented numerous improvements to the spreadsheets used to complete the annual updates of the existing CVP interim cost allocation. These improvements are of two types: to correct errors previously not recognized in the allocation of project costs and to significantly reduce the time and effort to complete the allocation update computations.

The GAO also suggested two alternative approaches for the allocation of joint costs that were intended to simplify and streamline allocation computations. One method would allocate joint costs in direct proportion to specific costs assigned to each project purpose. The second method would

allocate joint costs on the basis of use and assumes that the uses of each facility for each project purpose can be accounted separately. The problem with this second method and the reason why it is not considered viable is that for some facilities there is no common unit of measurement for such an apportionment. For example, although the storage capacity of reservoirs formed by dams can often be apportioned between flood control space and water storage, such facilities are also used for hydropower production with no specific reservation of reservoir storage space for power production.

As discussed in the following sections, both allocation methods suggested by the GAO were considered in this study. The one viable GAO method, the allocation of joint costs in proportion to specific costs, was carried forward for evaluation.

ALLOCATION METHODS CONSIDERED

A variety of methods exist to allocate costs of multi-purpose projects among project users and beneficiaries. The use of different methods often gives different results. Each method has certain advantages and limitations. As described in Chapter II, no single method had been established for the allocation of costs of Federal multi-purpose water resources projects during the first half of the 20th century when many projects were in the planning stage. The resulting variation often triggered intra-agency and interagency disputes related to the selection of allocation methods. Because the selection of a cost allocation method could affect the apparent financial viability of a project, it has been said that allocation methods were sometimes used to promote the development of those project purposes with the most organizational support.

In 1954 Reclamation adopted the SCRB allocation method. Prior to that time, several other procedures had been employed. Although they are no longer used, previously used techniques, as discussed below, can be useful for understanding the use and advantages of the SCRB method. In the development of alternatives, several historical and relatively recent allocation methods were reviewed and considered for potential application to this study or for recommendation in subsequent studies.

As noted in Chapter I, the central challenge of the cost allocation process is the allocation of joint costs, and the following sections describe a variety of approaches to allocate joint costs of multi-purpose projects. Some of these methods are described simply to provide historical perspective of the issues involved in the allocation of CVP costs while others could possibly be viable methods for application to the CVP. Again, as noted in Chapter I, the scope of this study limits Reclamation's ability to undertake a complex reallocation of joint costs at this time. However, a thorough review of potential allocation methods was completed to identify methods that may be applicable in whole or in part for the purposes of this study. The methods are not presented in order of potential application or preference.

In general terms, cost allocation methods considered in this study can be organized into four groups: quantity-based methods, priority-based methods, benefits-based methods, and user- group methods. Quantity-based methods are founded on the premise that joint costs can be shared in proportion to physical characteristics or the costs of single-purpose facilities. These approaches are relatively simple to comprehend, but often difficult to apply in practice. Priority-based methods assume that project purposes can be ranked in order of priority, and joint costs can be allocated based on these priorities. Benefits-based methods consider the benefits of a project or can employ measures of alternative costs to achieve the benefits for each purpose. Although benefits-based methods are more complex and time-consuming to apply, they provide a common base (dollars) on which to measure benefits for a variety of purposes. User-group methods focus on cost allocation arrangements under which different user groups, representing project purposes, would join together to pursue a multi-purpose project.

Quantity-Based Methods

Some early cost allocation procedures were based on measurable physical criteria such as “use of space” or “water released.” For application to multi-purpose projects, however, it was found that such approaches often did not adequately measure the extent of use by the various purposes involved.

For example, it was difficult to compare the use of reservoir space reserved for water storage with that used for flood control since the former had no specific reservation in CVP reservoirs. The physical approach was also found to be unsatisfactory because it did not provide a common denominator for all purposes involved. For example, physical measurement procedures do not adequately recognize that fish and wildlife benefits can be realized without the release of additional water over the amounts used for irrigation, power generation, and flood control.

Each of the following methods utilizes a quantity (physical or financial) associated with facilities to allocate joint costs. The advantages and disadvantages of each method are described.

Use of Facilities – The use of facilities method is based on the premise that joint costs should be allocated among the various purposes in proportion to their amount of “use” of the multi-purpose facilities. Two different approaches may be taken in determining the meaning of the term “use.” The first is related to capacity of a project facility, or “readiness to serve.” The second concerns the quantities of water actually involved.

As an example, consider a canal that serves water to both irrigation and M&I users. Although irrigation and M&I are considered as a single-purpose (water supply) in the CVP cost allocation, it provides a good example of the application of this method.

Under the capacity-driven approach, the canal cost would be assigned to the two functions (irrigation and M&I) in proportion to the canal capacity required by each to meet its peak flow demands. In practice, neither function would use its entire capacity all of the time, but the canal would be scaled in size to meet “peak” combined demands, which usually occur in midsummer. The chief merit of this method is that it charges each function

according to the magnitude of its use or its “readiness to use.” However, application to a true multi-purpose facility, such as a reservoir, would require an estimate of costs for single-purpose projects, as described in a subsequent method, and as noted previously such effort was beyond the scope of the study. Because of this and because of the problems with capacity-based measures generally (discussed above), capacity-driven use of facility method was dropped from further consideration.

Under the quantity of water approach, the canal costs would be allocated to the irrigation and M&I functions proportionate to the actual quantity of water delivered for each purpose during a year. This approach is currently applied in the sub-allocation of CVP water supply costs among M&I, irrigation, and wildlife refuges, and is utilized in the allocation of water supply facilities in the San Luis Unit and San Felipe Division. Therefore, this method is retained for application in the sub-allocation of CVP water supply costs.

Reservation of Dedicated Space – This method would allocate joint costs among project purposes based on the proportional reservation of the facility for each purpose. This method may appear well suited for the allocation of dam and reservoir costs but requires a common unit of measurement for all project purposes. For the CVP it may be most applicable for allocating costs to the flood control purpose since storage space is reserved for flood control. This method, however, cannot be used to allocate the costs of CVP dams and reservoirs to other project purposes because the operation of the CVP includes no explicit reservation for recreation, water supply, fish and wildlife, navigation, power, or water quality. This method was retained for possible use in “creating” a separable cost for flood control in the development of an alternative for further consideration.

Separate Projects Method – The separate projects method may divide either (1) the total cost of a project or (2) the joint cost (after first allocating the specific or separable costs to the purposes) in proportion to the cost of obtaining the same project benefits by constructing suitably sized

single-purpose projects. Because alternative projects need not be justified this method may produce unreasonable results – a limitation that has prevented wide acceptance of this method. Due to its limited acceptance and the significant effort that would be required to develop conceptually separate projects, this method was dropped from further consideration.

Equal Apportionment Method – Since there is no fixed mathematical formula for allocating costs, this method apportions either all of the costs of the project, or its joint costs, equally among the purposes. Obviously, the results of such a method could be considered arbitrary and even unreasonable unless the respective purposes produced benefits that were approximately equal. For example, it could easily result in an allocation in which one project purpose was allocated costs greater than the benefits received. Since this method was considered arbitrary, it was dropped from further consideration.

Priority-Based Methods

The following methods are based on the assumption that multi-purpose projects are designed and operated to meet a primary purpose and that all other purposes are subsidiary.

Priority of Use Method – The priority of use method is based on the premise that when a project is operated primarily for one purpose and secondarily for another, the primary purpose should be assigned a greater portion of the cost. In all multi-purpose projects, the various purposes compete with each other to some extent for the use of water or storage space. The purposes have different time requirements for the periods of optimum release and storage of water; thus, all of them cannot be served in the most advantageous manner. If this method were to be developed, significant study would be required to evaluate potential project operations under a variety of prioritization schemes. This approach would be needed to identify the extent to which priority is given to each project purpose. Furthermore, at least in the case of the CVP, these priorities may change over time, further complicating a determination of the way to apply the method. The recognition that multi-purpose facilities of the CVP are often

operated to meet multiple priorities and that significant cost would be required to complete a series of operations studies suggests that this method may not be appropriate for the allocation of CVP costs. Therefore, this method was dropped from further consideration.

Incremental Method – The incremental method allocates the separable costs to their respective purposes and the total joint cost to one basic purpose, considered to be the principal or basic purpose of the project. An example would be found in a multi-purpose project serving flood control, irrigation, and electric power. If flood control were identified as the primary purpose, flood control would be allocated its separable cost plus all of the joint costs. Then, the irrigation and power purposes would be allocated only their respective separable costs. This method is not considered applicable to the CVP since the project was not authorized nor is operated to meet a primary purpose. Therefore, this method was dropped from further consideration.

Specific Costs Method – The specific cost method is a variation of the incremental method. Instead of allocating separable costs to the incidental purposes, only specific costs are allocated to those purposes. The remaining joint costs are then assigned to the primary purpose. Using this method may be justified where a purpose is added after a project has been completed. For example, dams are sometimes built containing penstocks, but no other facilities for power generation. When generation facilities are added after passage of a number of years, they might legitimately be considered to be a new project. This “new project” concept might utilize the specific costs method of allocation. This method is also not considered applicable to the CVP since the project was not authorized, nor is it operated, to meet a primary purpose. Therefore, this method was dropped from further consideration.

Benefits-Based Methods

Because of the limitations inherent in the use of measurable physical criteria, attention was focused on approaches based on benefits. Theoretically, there are many advantages to the benefits concept because it not only measures the extent of use but

also provides a common denominator for all purposes involved. However, a method strictly based on benefits does not recognize the possibility of securing comparable effects at less cost through alternative means. Thus, methods that recognize both benefits and alternative costs have been developed and reviewed below. The AJE method and the SCRB method are examples of methods that combine benefits and alternative costs.

Each of the benefits-based methods discussed below depends on the benefits obtained from the various purposes served. All three approaches limit the cost allocated to any purpose so that it will not exceed the corresponding benefits. A principal difficulty in all the procedures is the necessity of estimating all benefits on a comparable basis and stating them in monetary values.

The Benefits Method – The benefits method allocates the total cost of the project among the various purposes in proportion to their estimated benefits. This assumes that the entire project can be considered a joint cost. Another procedure also referred to as the benefits method first allocates specific costs to each purpose, then allocates a share of the joint cost in direct proportion to the estimated net benefits accruing to it. The latter procedure is similar to the AJE method described below.

Alternative Justifiable Expenditure Method – The AJE method fundamentally and indirectly rests on an estimate of benefits, but it is directly based on the justified investment for each purpose. The maximum justified investment is the smaller of either (1) the benefits ascribed to the purpose or (2) the cost of the most economical alternative single-purpose project which would achieve substantially the same benefits as does that purpose in the multi-purpose project. The lesser of these two amounts, called the alternative justifiable expenditure, represents the largest investment that could be justified for a purpose in the multi-purpose project. This means that no more should be spent on any project purpose than (1) the value of the benefits it will produce, or (2) the cost of producing those benefits by the least expensive alternative source. The approach is used to establish the maximum cost allocated to each project purpose. The minimum allocation to each project purpose is

the specific cost incurred for each purpose.

Examples of single-purpose alternative projects are thermal instead of hydro powerplants, rail instead of water transportation, and levees instead of storage space for flood protection. The alternative projects are hypothetical, and there are instances where an alternative for one purpose is located within the same space as the alternative of another, which is a physical impossibility. However, this does not prevent the use of the estimated costs of these alternatives in allocating the investment in a multi-purpose project.

After the maximum justifiable investment is determined for each purpose, the respective specific costs in the multi-purpose project are subtracted from it. Specific costs are the costs of individual physical features that serve only a single purpose. The balance is called the remaining justifiable expenditure. The joint cost—which is the total project cost minus the sum of all the specific costs—is allocated among the various purposes in direct proportion to the remaining justifiable expenditures.

Each allocated joint cost is then added to its respective specific cost in order to arrive at the total allocation to each purpose.

The AJE method has several advantages. First, no purpose is assigned costs greater than the value of its services or costs less than its specific costs.

Second, AJE may be tied closely to the project's original formulation procedure by use of the same single-purpose alternatives and benefits for each purpose. If a significant period of time has passed since the original project formulation, however, the benefits and appropriate single-purpose alternative may have changed.

The AJE method, however, has two major shortcomings. First, because of budgetary and staffing constraints, the cost of alternative projects generally will not receive as thorough an investigation as will a project contemplated for construction, and, second, the economic basis for this method is uncertain because it is usually impossible for all of the alternative projects to coexist. These shortcomings raise questions as to whether the alternatives are, in fact, the most economical alternative sources. Simply stated, in the absence of the multi-purpose project, all of its

accomplishments could not be realized by a series of single-purpose projects at the cost indicated in the allocation study.

Separable Costs-Remaining Benefits Method – The separable costs-remaining benefits procedure is basically a variation of the AJE method. The SCRB method uses the lesser of benefits or single-purpose alternative costs to determine the maximum allowable allocation, or justifiable expenditure, for each purpose in the same manner as AJE. However, from it the separable (instead of specific) costs are subtracted to obtain the remaining justifiable expenditure. Since separable and specific costs will often differ, the proportionate allocation of the joint costs will generally be different from that derived by the AJE.

The justifiable expenditure is the maximum and the separable cost is the minimum amount allocated to any purpose. The separable cost for each purpose is the difference between the cost of the multi-purpose project and the cost of the project with the purpose omitted. Separable costs usually include more than the specific costs of physically identifiable facilities serving only one purpose. Separable costs include all added costs of increased size of structures and changes in design for a particular purpose over structure size and design required for all other purposes. An example would be the cost of increasing reservoir storage capacity. Separable costs are usually higher than specific costs; however, the two may, on occasion, be equal. Specific costs can never exceed separable costs because specific costs are, by definition, also separable. When the two are equal, the SCRB and AJE methods are identical.

The sum of the separable costs is subtracted from the total project cost to obtain the joint cost, which is then allocated among the purposes in proportion to the remaining justifiable expenditure for each purpose in the same way as for the AJE method. Separable costs and allocated joint costs for each purpose are added together to complete the allocation process.

The SCRB method, which is very similar to the AJE method, has most of the same advantages and disadvantages. However, using separable rather than specific costs usually reduces the amount of

joint costs and increases minimum allocations to project purposes.

One disadvantage is that separable costs are not easily determined and generally require extensive expense and time to estimate. For the current CVP, even historical information on specific design details, quantities, and alternative facility designs are not always available and would need to be redeveloped before separable costs could be re-computed. The extensive level of effort necessary to estimate updated separable costs was not anticipated in the budget for this study. Therefore, the development of a new SCRB-based allocation was not considered for this study, but the SCRB method, employed in earlier cost allocations, was retained because of its many advantages and because it has remained the procedure established for use by Federal water resources agencies. The use of separable and joint cost allocation factors developed in the 1975 reallocation study was retained for consideration.

User Group-Based Methods

Shapley Value Method – The Shapley value method uses information on all possible combinations of users to derive a unique cost allocation that should be acceptable to all users as long as all of the alternative cost functions are “well behaved.” This latter phrase means that (1) the sum of the costs serving each user (or group of users) alone is greater than the project cost of serving them, and (2) each user (or group of users) has a benefit or alternative cost for his (their) share of the water supply that exceeds the incremental cost of providing project water to him (them).

The cost allocation for a user is derived as a weighted average of all the marginal costs of adding the user to every possible group. These groups include the “going-it-alone” option. The weights assume that every group is equally likely and are based on the number of users. The weights are one divided by the number of possible sequences in which all users could have joined the project. The number of possible sequences is N-factorial where N is the number of users. If there are four users, for example, then the number of sequences is $4 \times 3 \times 2 \times 1$ or 24, and the weights are $1/24$.

The major problem with this method is that it requires not only benefit estimates but also a large number of cost estimates in the case where the number of users is large. If there are 5 or 6 users, for example, the number of required cost estimates becomes 120 and 720, respectively. The Shapely method results in a cost allocation in which each user covers its separable costs.

Game Theory Methods – Game theory is the study of the progress and outcome of games, conducted under a specified set of rules, and involving a number of players. Cooperative games are situations in which the players may be able to gain by cooperating with the other players. Cost allocation problems are much like a cooperative game. Each purpose is represented by a player, and the purpose may be accomplished for less cost by participating in the project as opposed to going it alone. If the purpose has a benefit that exceeds the minimum cost of participating (the separable cost), and if this minimum cost is less than the cost of non-participation (the alternative cost), then the player will choose to participate. The most he would pay is the separable cost plus the cost savings from not incurring the alternative cost. These methods also require not only benefit estimates but also estimates of numerous alternatives, and they tend not to be easily comprehensible.

Both Shapley Value and Game Theory methods require significant amounts of data on benefit estimates and alternative costs, extending beyond the scope of this study. In addition, they are conceptually quite complex and often a challenge to comprehend and were not considered appropriate for this study.

ALLOCATION ALTERNATIVES DEVELOPED

After completing review of the various methods described above, three alternatives were developed for evaluation in this study. These include the existing cost allocation (Existing Allocation), which will form the basis of comparison; an alternative in which joint costs are allocated in proportion to specific costs consistent with a suggestion from the GAO (Proportional Alternative); and an alternative proposed by the water and power contractors

(Contractors' Proposal). (The text of the contractors' proposal is included as Appendix A.) Each of these cost allocation alternatives is described in the following sections and summarized in Table IV-1.

Existing Allocation

The existing CVP cost allocation comprises the no-action alternative and would involve continued use of the procedure described in Chapter III to allocate joint costs. In general, this alternative would utilize joint cost allocation factors based on SCRB analysis completed for the 1975 reallocation study.

Proportional Alternative

This alternative was developed based on a suggestion from the GAO and would allocate joint costs in proportion to specific costs. The costs of single-purpose facilities would be summed to determine the total specific cost for the CVP. The proportion of total specific cost incurred for each purpose would be determined and applied to total joint costs to allocate them among project purposes. The total allocation to a purpose would be the sum of specific and joint costs allocated to it.

Development of this alternative requires careful determination of total specific and joint costs. The following steps were taken to identify which costs should be included as specific or joint costs and to make adjustments to create a specific cost total for flood control. Beginning with the total project costs (\$3,290 million in the 1999 allocation) the following adjustments were made. (Costs of facilities subject to adjustment and joint costs are shown in Appendix B.)

TABLE IV-1
CHARACTERISTICS OF
COST ALLOCATION ALTERNATIVES

Characteristic	Existing Allocation	Proportional Alternative	Contractors' Proposal
Allocation of Joint Costs	Continues use of joint cost allocation factors as computed in 1975 SCRB.	Allocates joint costs in proportion to expenditures for specific project purposes.	Uses joint cost allocation factors computed in 1970 SCRB.
Allocation of CVPIA-dedicated water	Reduction in deliveries resulting from CVPIA implementation is reflected in historic and projected water deliveries to irrigation and M&I users.	Same methodology as existing allocation.	<p>Reduction in deliveries resulting from CVPIA implementation is reflected in historic and projected water deliveries to irrigation and M&I users.</p> <p>Establishes the “environment” as a water user and includes “delivery” of up to 800,000 acre-feet per year of water to the environment. The quantification this water is based on an assumed rate of buildup designed to reflect project operations.</p> <p>This approach increases the total water delivery base used to sub-allocate water supply costs among repayment functions.</p>

Characteristic	Existing Allocation	Proportional Alternative	Contractors' Proposal
<p>Repayment of water supply costs</p>	<p>Repayment of water supply costs is proportional to historic and projected water deliveries to end-users over the life of the project.</p> <p>Water supply costs are sub-allocated in proportion to deliveries to irrigation, M&I, and wildlife refuges.</p> <p>Reimbursable costs associated with deliveries to wildlife refuges are distributed in proportion to repayment obligations for irrigation, M&I and commercial power customers.</p>	<p>Same as methodology as existing allocation.</p>	<p>Same methodology as existing allocation, but applied to the increased total water delivery base as follows.</p> <p>A portion of the 800,000 acre-feet added to the water delivery base is considered “mitigation” and the remainder is considered “enhancement.”</p> <p>Water supply costs associated with the “mitigation” portion of the 800,000 acre-feet are sub-allocated to the irrigation, M&I, and commercial power repayment functions using the same methodology as the existing allocation.</p> <p>Water supply costs associated with the “enhancement” portion of the 800,000 acre-feet are not repaid by water and power users.</p>
<p>Repayment of power costs</p>	<p>Total power costs are sub-allocated among project use and commercial power functions based on power generation and use analysis completed by Reclamation.</p> <p>Project use power costs are distributed in proportion to water deliveries to irrigation, M&I, and wildlife refuge uses.</p> <p>Reimbursable project use power costs associated with deliveries to wildlife refuges are distributed in proportion to repayment obligations for irrigation, M&I and commercial power customers.</p>	<p>Same methodology as existing allocation.</p>	<p>Same methodology as existing allocation.</p>
<p>Repayment of reimbursable fish and wildlife mitigation costs</p>	<p>Repayment responsibilities are apportioned based on the repayment responsibilities associated with capital costs associated with the “causal” facility. CVPIA cost shares set by Congress.</p>	<p>Same methodology as existing allocation.</p>	<p>Same methodology as existing allocation.</p>

Exclude Certain Costs from Allocation –

The non-reimbursable CVP cost components and authorized deferred use discussed in Chapter III amount to more than \$135 million and are excluded from the portion of the proportional alternative spreadsheet that calculates the joint cost allocation factors. In addition, the State share of San Luis Unit costs, totaling \$224 million, was also excluded from that portion of the spreadsheet. In summary, the costs excluded are of the following types:

- Federal share of Safety of Dams improvements
- Archeology, highway improvement
- Non-reimbursable IDC
- Capitalized movable equipment
- Buildings and service facilities
- Authorized deferred use
- State share of San Luis Unit

Exempt Certain Costs from Allocation –

In the specific cost total used to allocate joint costs, it was considered inappropriate to include the costs of multi-purpose facilities constructed and allocated by the COE and transferred to Reclamation or the costs of facilities with previously fixed allocations. It was also considered inappropriate to include local distribution facilities that are subject to repayment contracts since these facilities are paid for by separate contracts and not included in the water and power rates that result from the allocation. Also distribution systems can be separated from main project facilities and could have been non-Federally financed. A total of approximately \$1,123 million in costs was removed from the portion of the spreadsheet that calculates the joint cost allocation factors. A summary of features exempted is provided in Table IV-2.

Create Specific Cost for Flood Control –

The removal of the costs of features shown above reduced the total of specific and joint costs to approximately \$1,808 million, of which \$623 million is considered joint costs and \$1,185 million specific costs. No single-purpose CVP facilities have ever been constructed for flood control. Thus, although flood control is an authorized purpose of the CVP and significant flood control benefits are realized by the project, the Proportional Alternative would allocate no joint cost to this purpose. A similar problem also emerges for navigation and water quality, which are authorized purposes with no specific costs.

As a means to recognize that flood control is an important authorized purpose of the CVP, an adjustment was made to the specific and joint costs described above. The reservation of dedicated space method was used to estimate the portion of total reservoir storage capacity that is reserved for flood control and therefore not available to all other purposes. A simplified approach was selected to minimize the effort required to calculate this cost. The specific costs for flood control in three reservoirs, Shasta, Folsom, and Millerton, were calculated using a weighted-average factor based on the percent of total reservoir space reserved for flood control each month. The resulting factors were applied to the total costs for these facilities to create “specific” costs for flood control. In total, this approach shifted approximately \$24 million from joint costs to specific costs for flood control, resulting in a total of \$599 million in joint costs and \$1,209 million in specific costs. Then the allocation of specific costs was used to determine the allocation of the joint costs. It is important to note that any changes over the life of the project in the space reserved for flood control would change the level of specific costs allocated to flood control and then the allocation of project joint costs.

TABLE IV-2

FEATURES EXEMPT FROM PROPORTIONAL ALTERNATIVE

FEATURE	REASON FOR EXEMPTION
<p style="text-align: center;">Items transferred by the COE</p> <ul style="list-style-type: none"> • New Melones Dam, Reservoir and Powerplant • Black Butte Dam and Lake • COE Repayment Assumed 	<p>Multi-purpose projects with cost allocations and repayment obligations determined by the COE.</p>
<p style="text-align: center;">Features Not Integral to the CVP</p> <ul style="list-style-type: none"> • M&I Distribution Systems with Repayment Contracts • Irrigation Distribution Systems with Repayment Contracts • Western Interties • San Felipe Division 	<p>The repayment contracts pertain to facilities that are paid for specifically by water districts and do not, therefore, affect water and power rates. Additionally, these facilities can be separated from main project features. The costs of the Interties are repaid entirely by commercial power users. The San Felipe Division is out-of-basin and not an integral part of the water- and power-generating CVP.</p>
<p style="text-align: center;">Facilities with Fixed Allocations</p> <ul style="list-style-type: none"> • Los Banos Dam – Federal-Only Portion • Spring Creek Debris Dam 	<p>The allocation of the costs of the Federal share of Los Banos Detention Dam and Spring Creek Debris Dam were fixed prior to 1970.</p>

Contractors’ Proposal

In October 1999, the CVP water and power contractors jointly presented a proposed alternative to allocate CVP costs for consideration in this study. Upon review, Reclamation decided to include the proposal as an alternative. The Contractors’ Proposal, as interpreted by Reclamation, is based on the existing cost allocation but contains two significant components that would alter the allocation and repayment of CVP costs. First, the proposal includes the use of a slightly revised version of Base I joint cost allocation factors calculated in the 1970 reallocation study rather than the factors calculated in the 1975 study. Second,

the proposal specifically takes into account the environmental re-operation of the CVP by creating an environmental water use account.

Joint Cost Factors – As noted in Chapter II, the 1970 reallocation study separated the CVP into units, or bases, with each base allocated separately, and these allocations were summed to derive the allocation for the entire CVP. Base I consisted of the Trinity River, American River, Sacramento River, Friant, Shasta, and Delta Divisions. This practice was continued in the 1975 reallocation study. Table IV-3 shows the joint cost allocation factors for Base I.

TABLE IV-3
COMPARISON OF JOINT COST ALLOCATION FACTORS FOR BASE I FACILITIES

PURPOSE	1970 ALLOCATION	1970 ALLOCATION REVISED BY CONTRACTORS	1975 ALLOCATION
Water Supply	0.54180	0.54344	0.55790
Power	0.05630	0.05883	0.21810
Fish and Wildlife	0.01920	0.02004	0.0
Flood Control	0.36120	0.35520	0.20490
Navigation	0.02150	0.02249	0.01910
Recreation	0.0	0.0	0.0
Water Quality	0.0	0.0	0.0
Total	1.00000	1.00000	1.00000
Note: Totals may not be completely accurate due to rounding.			

The joint cost allocation factors for the 1970 cost allocation have been revised slightly in the Contractors' Proposal. In the 1970 reallocation study, Friant Dam and Reservoir were treated in the same way as other Base I dams and reservoirs, with the result that some of Friant's cost were allocated to power. Friant, however, has no power-generating facilities. In the 1975 reallocation study, Reclamation allocated costs for Friant Dam and Reservoir costs to water supply and flood control only. The contractors adopted this approach and prepared a new allocation for Friant, and as a consequence, their version of the 1970 joint cost allocation factors differs slightly from the original. Hereafter, reference to the 1970 joint cost allocation factors in this report will mean the revised set as presented in the Contractors' Proposal.

As one can see from Table IV-3, the most significant difference between the 1975 and 1970 joint cost allocation factors concerns power and flood control. The power factor increased to 21.8 percent in 1975 from 5.9 percent in 1970 while flood control fell to 20.5 percent in 1975 from 35.5 percent in 1970. In the 1970 study, the single-purpose power alternative was a fossil fuel powerplant while a nuclear powerplant was used in

the 1975 study. Power values were provided by the Federal Power Commission.

For both studies, the cost of the single-purpose power alternative was less than the value of power benefits and was used in the SCRB methodology as the justifiable expenditure. From the 1970 allocation to the to 1975 allocation, the justifiable expenditure for power more than doubled while the separable power cost, which is subtracted from the justifiable expenditure to obtain the remaining justifiable expenditure, increased by two-thirds. As a result the remaining justifiable expenditure for power increased significantly in comparison to that for other project purposes, and since the joint cost factors are based on the distribution of remaining justifiable expenditures among project purposes, the joint cost allocation factor for power increased significantly. The remaining justifiable expenditure for flood control actually fell slightly in 1975, and its joint cost allocation factor also fell.

The Contractors' Proposal recommends use of the 1970 joint cost allocation factors for Base I for the following reasons.

1. The 1970 reallocation study is the last major allocation of the CVP. Although documentation for both the 1970 and 1975 allocation studies is limited, the contractors' review of the 1970 study stated that its underlying assumptions are reasonable.
2. From the contractors' perspective, the power assumptions used in 1970 study are more representative of power industry conditions existing throughout the 1970s than those used in the 1975 study, and the 1970 powerplant assumptions are more representative of subsequent periods after nuclear energy was no longer a viable energy resource when the period of spiraling energy prices, which characterized the mid-1970s, had ended.
3. According to the Contractors' Proposal, the allocation of multi-purpose costs to flood control would be "properly restored to a reasonable and equitable level." Partial flood control studies of parts of the CVP since 1975 have given a strong indication that flood control benefits are substantially understated, even for 1970.

Environmental Water Use Account – The Contractors' Proposal maintains that the authorized purposes of the CVP have been greatly expanded and that the project has undergone significant re-operation since completion of the 1975 reallocation study. The accomplishments of the project have been altered dramatically as a result of legislation and policy decisions including the CVPIA, Endangered Species Act (ESA) listings, and Bay-Delta Plan. According to the proposal, the existing allocation method does not adequately reflect the significant new environmental benefits that have been generated by the re-operation of the project and the associated enhancement and mitigation activities that have occurred. Also, the existing allocation method does not reflect the reduction in benefits accruing to water and power users.

The Contractors' Proposal also contends that section 3406(a) of the CVPIA amended the Act of August 26, 1937, to establish the environment as a new project purpose. The new purpose was established to mitigate, protect, restore, and enhance the environment. As noted in Chapter II, although

section 3406(b)(2) of the CVPIA dedicates 800,000 acre-feet of CVP yield toward fish and wildlife activities, it is silent on the issue of cost sharing/allocation. By contrast, section 3406(d) of the act addresses water supplies for wildlife refuges and is much more specific regarding repayment of associated costs. Reclamation's *Report on Refuge Water Supply Investigations*, March 1989, on which the refuge water requirements in section 3406(d) are based, identifies water supplies known as Level 1, 2, and 4. Level 1 supplies are a part of the larger Level 2 and refer to water rights refuges already had at the time and water supplied pursuant to the Act of August 27, 1954. Level 2 supplies were then current average annual water deliveries to refuges while Level 4 was an increment of water beyond Level 2 needed to bring the refuges to optimum management.

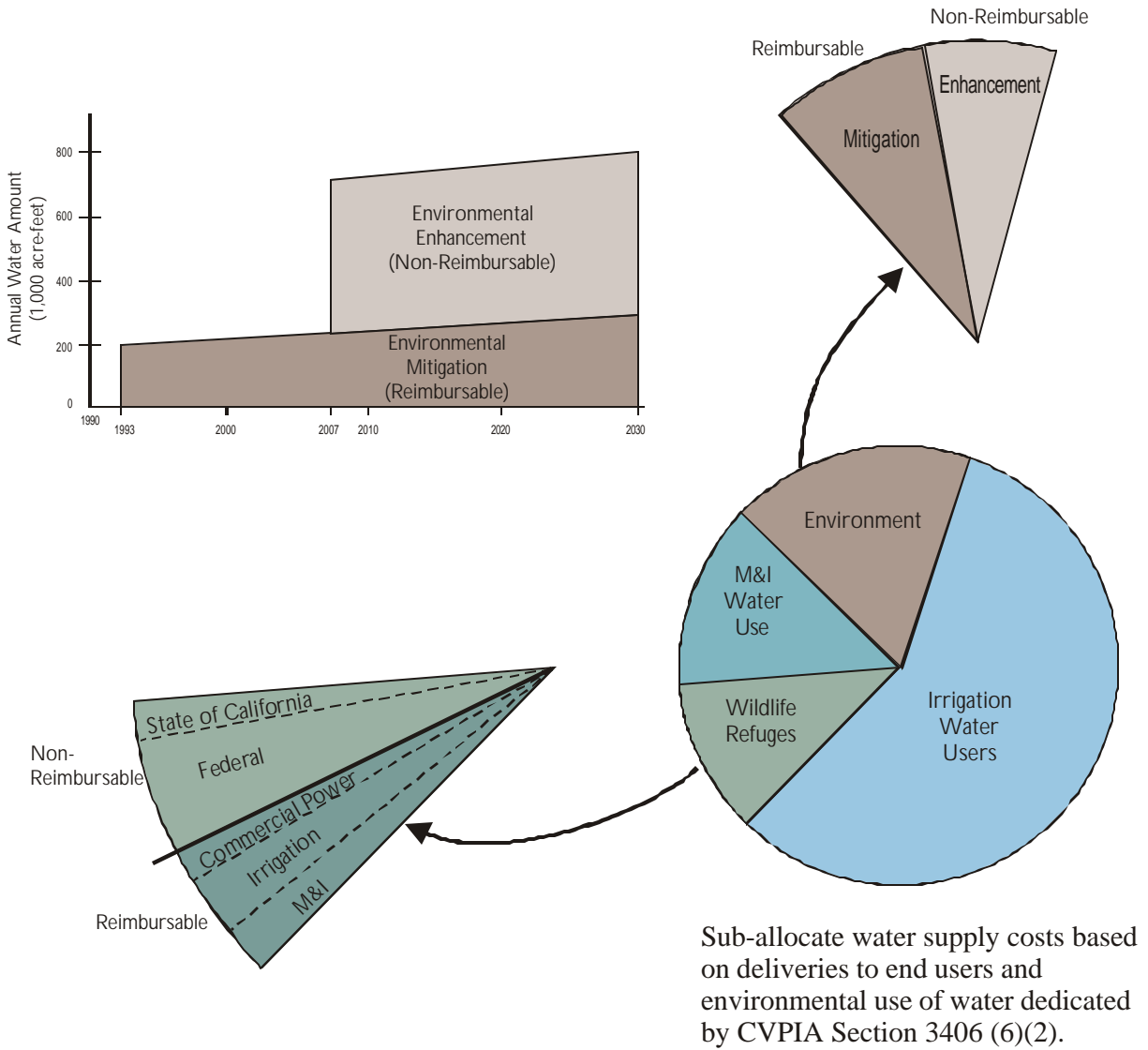
The first sentence of section 3406(d)(3), which addresses repayment of the costs of supplying water to the refuges, states that all costs associated with implementation of paragraph (1) of this subsection shall be reimbursable pursuant to existing law. Paragraph (1) deals with Level 2 refuge water supplies. The remainder of the subsection specifies that 75 percent of the cost of the increment from Level 2 to Level 4 will be Federal non-reimbursable and 25 percent be borne by the State. Reclamation's interpretation of section 3406(d)(3) treats the costs of Level 1 supplies as non-reimbursable while the costs of the remainder of Level 2 are reimbursable by water and power users. Reclamation considers it significant that Congress was specific in addressing the allocation of costs of refuge water supplies in the CVPIA, but made no mention of associating costs with the dedication of 800,000 acre-feet of water or of allocation of such costs.

To reflect the changes in re-operation of the CVP, the contractors propose including the environment as a new project function for the sub-allocation of costs allocated to water supply. Up to 800,000 acre-feet of environmental water dedicated by section 3406(b)(2) of the CVPIA would be treated as an additional CVP water supply, and water supply costs would be assigned to it. As noted above, section 3406(b)(2) is silent on the issue of cost sharing/allocation. The Contractors' Proposal

would treat the repayment of costs associated with the environmental water similarly to the repayment requirements specified for many of the actions mandated in section 3406(b)(4)-(23) of the CVPIA.

For many of these actions, 37.5 percent of the cost is to be repaid by water and power users, 37.5 percent is a Federal non-reimbursable cost, and 25 percent is to be repaid by the State. Thus from the point of view of water and power users, 62.5 percent of these costs are non-reimbursable. The proposal would treat 37.5 percent of the costs associated with the environmental water account as reimbursable by water and power users, and the remaining 62.5 percent would be considered non-reimbursable. Since under Reclamation law the costs of fish and wildlife mitigation measures for recently constructed facilities are generally reimbursable, this cost sharing arrangement would be tantamount to treating 37.5 percent of the environmental water as mitigation water and the remaining 62.5 percent as enhancement water.

As illustrated in Figure IV-1, from 1993 through 2006, while Stage I of the CalFed environmental restoration actions are being completed, the quantity of environmental water would gradually increase each year on a schedule provided in the proposal. The proposal considers all of this water to be for mitigation, and the costs associated with it would be totally reimbursable. Beginning in 2007 when the proposal assumes that restoration actions would be complete, there would be a dramatic increase in environmental water use because enhancement would begin. The repayment of associated costs would be treated as 37.5 percent reimbursable (mitigation) and 62.5 percent non-reimbursable (enhancement). By the end of the CVP repayment period in 2030, the environmental water account would have increased to the full 800,000 acre-feet, with the costs associated with 300,000 acre-feet, representing 37.5 percent of the 800,000 acre-feet, repaid by water and power users and the remainder non-reimbursable.



Distribute refuge water costs based on CVPIA-Specified Refuge Delivery Levels:

- Level 1 - Non-Reimbursable Federal
- Level 2 Increment - Reimbursable
- Level 4 Increment - Non-Reimbursable (75% Federal, 25% State)

Figure IV-1
Repayment of Water Supply Costs
in Contractors' Proposal

Chapter V

COMPARISON OF ALTERNATIVES

For the three alternatives considered in this study, this chapter presents the results of the allocation of costs to the seven authorized purposes of the CVP and then the determination of repayment responsibilities. The computational process is described and results for key steps are provided. Results for the Proportional Alternative and the Contractors' Proposal are compared to those for the Existing Allocation.

EXISTING ALLOCATION

As described in Chapter III, the Existing Allocation is based on cost allocation factors developed in the 1975 cost reallocation study. That study, which was undertaken as an update to the 1970 reallocation study, utilized the SCRB method to develop separable and joint cost allocation factors for the multi-purpose facilities in the CVP. The allocation of multi-purpose features that were constructed by the COE and transferred to the CVP for financial integration and repayment was not modified from the COE allocation. Although Folsom

Dam and Reservoir were constructed by the COE, these costs were allocated by Reclamation using the factors developed in the 1975 reallocation study.

To date the total cost of CVP plant-in-service facilities is approximately \$3,290 million (1999 CVP interim cost allocation annual update). This amount represents total non-indexed costs incurred since construction of CVP facilities began. Of this amount, a total of about \$623 million (about 19 percent of total costs) represents joint costs of multi-purpose facilities that were constructed by Reclamation. Table V-1 identifies portions of this amount that are allocated using separable or joint cost allocation factors developed in the 1975 SCRB reallocation. This process was described in Chapter III. The remaining plant-in-service costs, amounting to more than \$2.6 billion, represent costs of single-purpose facilities, costs not subject to allocation to one of the seven authorized purposes of the CVP, or costs of multi-purpose facilities for which the allocation of separable and joint costs was made by the COE.

TABLE V-1
COSTS ALLOCATED USING SEPARABLE AND
JOINT COST ALLOCATION FACTORS

ITEM	(\$MILLION)
Costs allocated using joint factors	469.3
Costs allocated using separable factors	153.5
TOTAL	622.7
Note: Totals may not be completely accurate due to rounding.	

Total costs allocated to the seven authorized purposes of the CVP can be classified into three categories. These are costs of single-purpose facilities that are allocated in total to that purpose, costs of multi-purpose facilities that are allocated by Reclamation using factors from the 1975 SCRБ reallocation, and costs of COE-constructed facilities allocated by it. Table V-2 summarizes the allocation of CVP plant-in-service costs as of September 30, 1999, to the seven authorized project purposes and also lists those costs not subject to allocation to these purposes.

Repayment of allocated costs in the Existing Allocation is based on repayment criteria applicable to each project purpose. As described in Chapter III, costs allocated to water supply and power are sub-allocated to reimbursable and non-reimbursable functions based on the proportion of water delivered or power used in the delivery of water for specific functions. Water supply costs are sub-allocated based on the sum of historic and projected water deliveries to irrigation and M&I water users and to wildlife refuges. Power costs are first sub-allocated between project use and commercial power functions based on a power generation.

TABLE V-2
ALLOCATION OF PROJECT COSTS IN THE EXISTING ALLOCATION

ITEM	Cost (\$Million)
Project Purposes	
Water Supply	1,790.8
Power	665.1
Fish and Wildlife	263.4
Recreation	69.1
Flood Control	138.0
Navigation	5.8
Water Quality Improvement	5.5
Subtotal	2,937.7
Other Authorized Costs	
Authorized deferred use	56.9
Archeological, cultural, historical	4.1
Highway improvement	14.7
Non-reimbursable IDC	27.2
Safety of dams	25.6
State Share of San Luis	224.1
Subtotal	352.6
TOTAL	3,290.2
Notes:	
Results based on the 1999 CVP Interim Cost Allocation Annual Update.	
Costs for multi-purpose facilities allocated using factors derived from 1975 reallocation study.	
Totals may not be completely accurate due to rounding.	

and use study completed by Reclamation. Then, costs associated with project use power are further sub-allocated to irrigation, M&I and wildlife refuges based on energy requirements associated with water deliveries to these entities. Table V-3 summarizes total repayment responsibilities for plant-in-service costs in the Existing Allocation.

As described above and in Chapter III, with the exception of M&I and irrigation fixed obligation repayment contracts, the repayment responsibility of M&I water users and irrigation water users is collected by Reclamation in the water rates it charges its water contractors. The repayment responsibility of commercial power customers is collected by Western in the power rates it charges preference power customers. These repayment responsibilities represent costs

of facilities for water storage, water conveyance and pumping, power generation, and power transmission, and costs for other related system-wide facilities that are allocated to the water supply and power purposes. Water rates are based, in part, on the type of services utilized in storing and conveying water to each water user. For example, the rate for water that is stored in a CVP reservoir and then directly diverted by a water contractor from the stream below the reservoir would be lower than the rate for water that is stored in the same reservoir but also conveyed through a CVP canal and lifted for delivery to a water contractor by CVP pumping plants. The final step in the cost allocation process is the determination of costs associated with the water rate components that make up the repayment responsibility of M&I and irrigation water users.

TABLE V-3
REPAYMENT RESPONSIBILITIES IN
THE EXISTING ALLOCATION

REPAYMENT ENTITY	Cost (\$Million)
M&I Water Users	436.5
Irrigation Water Users	1,476.2
Commercial Power Customers	568.8
State of California and Local Governments	244.5
Federal Non-reimbursable	564.1
TOTAL	3,290.2
Notes:	
Results based on the 1999 CVP Interim Cost Allocation Annual Update.	
Costs for multi-purpose facilities allocated using factors derived from 1975 reallocation study.	
Totals may not be completely accurate due to rounding.	

Table V-4 shows total costs associated with the water rate components for M&I and irrigation water contractors for the Existing Allocation. The rate component “Other”

represents reimbursable costs of facilities considered environmental mitigation for the CVP as a whole rather than mitigation for a specific facility and is applied to all CVP M&I

and Irrigation water contractors. As explained in Chapter III, if an environmental mitigation facility can be associated with a specific facility, such as the Coleman National Fish Hatchery mitigating for Shasta and Keswick Dams, its repayment obligation would be classified in the same rate component as the facility it is mitigating. For project-wide mitigation measures, such as the Trinity River Restoration Program, repayment obligations are classified as “Other” and included in all CVP water contractors’ rates. The amounts shown as repayment contracts are fixed repayment obligations of M&I and irrigation water contractors for water distribution systems and do not enter into the determination of water rates.

PROPORTIONAL ALTERNATIVE

The Proportional Alternative differs from the Existing Allocation in the allocation of joint costs. In the Proportional Alternative, the allocation of the \$623 million of joint costs shown in Table V-1 is made in proportion to the

allocation of specific costs, which are the costs of single-purpose features. As described in Chapter IV, the derivation of joint cost allocation factors requires careful consideration of the nature of costs in the CVP cost allocation. Chapter IV describes approximately \$359 million in costs that are excluded from this calculation because they are non-reimbursable expenditures, many of which are not allocated to one of the seven authorized project purposes. In addition, a second group of costs are exempt from this process because they represent costs of facilities that do not affect water and power rates, or because they are associated with features that were allocated by the COE, or because their allocation has been fixed prior to the 1975 reallocation study. The San Felipe Division is included in this group because it is out-of-basin, does not contribute to the water- and power-generating capacity of the CVP, and its costs are the repayment responsibility of the two out-of-basin contractors in the San Felipe Division.

**TABLE V-4
WATER RATE COMPONENTS IN THE EXISTING ALLOCATION**

RATE COMPONENT	REPAYMENT RESPONSIBILITY OF M&I WATER USERS (\$Million)	REPAYMENT RESPONSIBILITY OF IRRIGATION WATER USERS (\$Million)
Storage	75.6	341.5
Conveyance	286.4	471.3
Conveyance Pumping	3.1	45.6
Direct Pumping	39.2	107.0
Other	8.3	40.4
Project Use Power	17.5	109.5
San Luis Drain	0.0	46.5
Subtotal Used in Setting Rates	430.2	1,161.8
Repayment Contracts for Distribution Systems	6.4	314.4
TOTAL	436.5	1,476.2
Notes:		
Results based on the 1999 CVP Interim Cost Allocation Annual Update.		
Totals may not be completely accurate due to rounding.		

The removal of the above-described costs reduces the total of specific and joint costs to approximately \$1,808 million, of which about \$623 million is considered joint costs and \$1,185 million is considered specific costs. As explained in Chapter IV, the allocation of specific costs based on this distribution would result in no allocation to flood control because no single-purpose CVP facilities have ever been developed for flood control. To address this deficiency, a “specific” cost for flood control was estimated based on proportional flood control storage in reservoirs authorized and operated for flood control. This adjustment creates a specific cost of about \$24 million for

flood control and raises the total specific cost to \$1,209 million and decreases total joint costs to \$599 million. A summary of total specific costs and the calculated joint cost allocation factors for the Proportional Alternative is presented in Table V-5.

The joint cost allocation factors shown in Table V-5 are applied to the \$599 million of joint costs. Allocated joint costs are added to (a) the specific costs listed in Table V-5 and (b) the excluded and exempt costs to develop the allocation of total costs. Table V-6 summarizes total plant-in-service costs allocated to the authorized project purposes and other authorized costs in the Proportional Alternative.

TABLE V-5
SPECIFIC COSTS AND JOINT COST ALLOCATION FACTORS IN THE PROPORTIONAL ALTERNATIVE

PROJECT PURPOSE	TOTAL SPECIFIC COST (\$MILLION)	JOINT ALLOCATION FACTOR IN PROPORTIONAL ALTERNATIVE
Water Supply	725.8	0.60036
Power	365.3	0.30215
Flood Control	24.0	0.01983
Fish and Wildlife	83.4	0.06902
Recreation	10.4	0.00864
Navigation	0.0	0.0
Water Quality	0.0	0.0
TOTAL	1,208.9	1.00000
Notes:		
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.		
Totals may not be completely accurate due to rounding.		

TABLE V-6
ALLOCATION OF PROJECT COSTS IN THE
PROPORTIONAL ALTERNATIVE

ITEM	Cost (\$Million)
Project Purpose	
Water Supply	1,888.5
Power	707.4
Fish and Wildlife	170.9
Recreation	69.4
Flood Control	95.7
Navigation	0.0
Water Quality Improvement	5.5
Subtotal	2,937.6
Other Authorized Costs	
Authorized deferred use	56.9
Archeological, cultural, historical	4.1
Highway improvement	14.7
Non-reimbursable IDC	27.0
Safety of dams	25.6
State Share of San Luis	224.1
Subtotal	352.6
TOTAL	3,290.2
Notes:	
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.	
Totals may not be completely accurate due to rounding.	

The calculation of repayment responsibilities in the Proportional Alternative is based on the same process described for the Existing Allocation. The sub-allocation of water supply costs is based on the same water delivery assumptions as in the Existing Allocation, and the sub-allocation of power costs is based on the same power generation and use study results as

the Existing Allocation. Table V-7 summarizes total repayment responsibilities for plant-in-service costs in the Proportional Alternative, and Table V-8 shows the total costs associated with the water rate components for M&I and irrigation water contractors for the Proportional Alternative.

TABLE V-7
REPAYMENT RESPONSIBILITIES IN THE
PROPORTIONAL ALTERNATIVE

REPAYMENT ENTITY	Cost (\$Million)
M&I Water Users	435.5
Irrigation Water Users	1,503.8
Commercial Power Customers	581.1
State of California and Local Governments	245.1
Federal Non-reimbursable	524.7
TOTAL	3,290.2
Notes:	
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.	
Totals may not be completely accurate due to rounding.	

TABLE V-8
WATER RATE COMPONENTS IN THE PROPORTIONAL ALTERNATIVE

RATE COMPONENT	REPAYMENT RESPONSIBILITY OF M&I WATER USERS (\$MILLION)	REPAYMENT RESPONSIBILITY OF IRRIGATION WATER USERS (\$MILLION)
Storage	71.4	383.8
Conveyance	286.4	445.6
Conveyance Pumping	3.1	45.6
Direct Pumping	39.2	107.0
Other	11.2	49.1
Project Use Power	17.8	111.9
San Luis Drain	0.0	46.5
Subtotal Used in Setting Rates	429.1	1,189.4
Repayment Contracts for Distribution Systems	6.4	314.4
TOTAL	435.5	1,503.8
Notes:		
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.		
Totals may not be completely accurate due to rounding.		

CONTRACTORS' PROPOSAL

The Contractors' Proposal differs from the Existing Allocation in two ways. First, the factors used to allocate joint costs are based on results from the 1970 reallocation study rather than results from the 1975 reallocation study. Second, the sub-allocation of water supply costs assumes uses of CVPIA-dedicated water for environmental purposes to be additional end uses of CVP water and combines these amounts with historical and projected deliveries to M&I and irrigation contractors and wildlife refuges.

The primary differences between the 1975 and the 1970 joint cost allocation factors are evident in the power and flood control purposes. Changing from the 1975 to the 1970 factors would reduce the power joint cost allocation factor from nearly 22 percent to less than 6 percent and would increase the flood control joint cost allocation factor from about 20 percent to nearly 36 percent. A comparison of joint cost allocation factors for the 1970 and 1975 reallocation studies is provided in Table V-9. Total allocated costs for the Contractors' Proposal are summarized in Table V-10.

TABLE V-9
COMPARISON OF JOINT COST ALLOCATION FACTORS

PURPOSE	1970 ALLOCATION REVISED BY CONTRACTORS	1975 ALLOCATION
Water Supply	0.54344	0.55790
Power	0.05883	0.21810
Fish and Wildlife	0.02004	0.0
Flood Control	0.35520	0.20490
Navigation	0.02249	0.01910
Recreation	0.0	0.0
Water Quality	0.0	0.0
TOTAL	1.00000	1.00000

Note: Totals may not be completely accurate due to rounding.

TABLE V-10
ALLOCATION OF PROJECT COSTS IN THE
CONTRACTORS' PROPOSAL

ITEM	COST (\$MILLION)
Project Purpose	
Water Supply	1,787.8
Power	616.6
Fish and Wildlife	269.4
Recreation	69.1
Flood Control	182.5
Navigation	6.8
Water Quality Improvement	5.5
Subtotal	2,937.7
Other Authorized Costs	
Authorized deferred use	56.9
Archeological, cultural, historical	4.1
Highway improvement	14.7
Non-reimbursable IDC	27.2
Safety of dams	25.6
State Share of San Luis	224.1
Subtotal	352.6
TOTAL	3,290.2
Notes:	
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.	
Costs for multi-purpose facilities allocated using factors derived from 1970 re-allocation study as revised by Contractors.	
Totals may not be completely accurate due to rounding.	

The calculation of repayment responsibilities in the Contractors' Proposal is based on the same process described for the existing allocation. The sub-allocation of water supply costs, however, is based on assumed end uses of CVPIA-dedicated water as well as historical and projected deliveries for M&I,

irrigation, and wildlife refuges. Table V-11 summarizes total repayment responsibilities for plant-in-service costs in the Contractors' Proposal, and Table V-12 shows the total costs associated with the water rate components for M&I and irrigation water contractors for the Contractors' Proposal.

TABLE V-11
REPAYMENT RESPONSIBILITIES IN THE
CONTRACTORS' PROPOSAL

REPAYMENT ENTITY	COST (\$MILLION)
M&I Water Users	434.6
Irrigation Water Users	1,443.4
Commercial Power Customers	533.0
State of California and Local Governments	244.3
Federal Non-reimbursable	634.9
TOTAL	3,290.2
<p>Notes:</p> <ul style="list-style-type: none"> Costs based on the 1999 CVP Interim Cost Allocation Annual Update. Costs for multi-purpose facilities allocated using factors derived from 1970 re-allocation study as revised by Contractors. Totals may not be completely accurate due to rounding. 	

TABLE V-12
WATER RATE COMPONENTS IN THE
CONTRACTORS' PROPOSAL

RATE COMPONENT	REPAYMENT RESPONSIBILITY OF M&I WATER USERS (\$MILLION)	REPAYMENT RESPONSIBILITY OF IRRIGATION WATER USERS (\$MILLION)
Storage	73.3	327.3
Conveyance	286.0	459.0
Conveyance Pumping	3.0	43.9
Direct Pumping	39.2	107.0
Other	10.3	44.8
Project Use Power	16.5	100.6
San Luis Drain	0.0	46.5
Subtotal Used in Setting Rates	428.3	1,129.0
Repayment Contracts for Distribution Systems	6.4	314.4
TOTAL	434.6	1,443.4
<p>Notes:</p> <ul style="list-style-type: none"> Costs based on the 1999 CVP Interim Cost Allocation Annual Update. Costs for multi-purpose facilities allocated using factors derived from 1970 re-allocation study as revised by Contractors. Totals may not be completely accurate due to rounding. 		

SUMMARY OF RESULTS

Table V-13 provides a summary of total costs allocated to each project purpose for the Existing Allocation, Proportional Alternative,

and Contractors' Proposal. For the latter two alternatives differences from the Existing Allocation are also shown for ease of comparison.

TABLE V-13
SUMMARY OF TOTAL ALLOCATED COSTS FOR ALL ALTERNATIVES
(\$ MILLION)

ITEM	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE		CONTRACTORS' PROPOSAL	
	TOTAL COST	TOTAL COST	CHANGE FROM EXISTING	TOTAL COST	CHANGE FROM EXISTING
Project Purpose					
Water Supply	1,790.8	1,888.7	97.9	1,787.8	-3.0
Power	665.1	707.4	42.3	616.6	-48.6
Fish and Wildlife	263.4	170.9	-92.5	269.4	6.0
Recreation	69.1	69.4	0.3	69.1	0.0
Flood Control	138.0	95.8	-42.3	182.5	44.5
Navigation	5.8	0.0	-5.8	6.8	1.0
Water Quality Improvement	5.5	5.5	0.0	5.5	0.0
Subtotal	2,937.6	2,937.6	0.0	2,937.6	0.0
Other Authorized Costs					
Authorized deferred use	56.9	56.9	0.0	56.9	0.0
Archeological, cultural, historical	4.1	4.1	0.0	4.1	0.0
Highway improvement	14.7	14.7	0.0	14.7	0.0
Non-reimbursable IDC	27.2	27.2	0.0	27.2	0.0
Safety of dams	25.6	25.6	0.0	25.6	0.0
State Share of San Luis	224.1	224.1	0.0	224.1	0.0
Subtotal	352.6	352.6	0.0	352.6	0.0
TOTAL	3,290.2	3,290.2	0.0	3,290.2	0.0
Notes:					
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.					
Totals may not be completely accurate due to rounding.					

Table V-14 summarizes total repayment responsibilities for the three alternatives. This table shows that the repayment responsibility for M&I water users in the Proportional Alternative and Contractors' Proposal would change very little from that in the Existing Allocation. Compared to the Existing Allocation, the total irrigation repayment responsibility would increase in the Proportional Alternative and would decrease by a somewhat larger amount in the Contractors' Proposal. Similarly, total commercial power repayment responsibility increases in the Proportional Alternative and decreases by a larger amount in the Contractors' Proposal.

The total repayment obligations by the State and local governments in the Proportional Alternative and Contractors' Proposal would be nearly the same those as in the Existing Allocation. The changes in reimbursable repayment obligations for water and power users would be offset by changes in Federal non-reimbursable costs. In the Proportional Alternative, Federal non-reimbursable costs would decrease by somewhat more than \$39 million while in the Contractors' Proposal Federal non-reimbursable costs would increase by nearly \$71 million.

TABLE V-14
SUMMARY OF REPAYMENT RESPONSIBILITIES IN ALL
ALTERNATIVES
(\$ MILLION)

REPAYMENT ENTITY	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE		CONTRACTORS' PROPOSAL	
	TOTAL COST	TOTAL COST	CHANGE FROM EXISTING	TOTAL COST	CHANGE FROM EXISTING
M&I Water Users	436.5	435.5	-1.0	434.6	-1.9
Irrigation Water Users	1,476.2	1,503.8	27.6	1,443.4	-32.8
Commercial Power Customers	568.8	581.1	12.3	533.0	-35.8
State of California and Local Governments	244.5	245.1	0.6	244.3	-0.2
Federal Non-reimbursable	564.1	524.7	-39.4	634.9	70.8
TOTAL	3,290.2	3,290.2	0.0	3,290.2	0.0
Notes:					
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.					
Totals may not be completely accurate due to rounding.					

The changes in water supply repayment responsibilities shown on Table V-14 are reflected in changes in costs associated with the M&I and irrigation rate components. As shown in Table V-15, costs for the M&I water rate components in both the Proportional and Contractors' Proposal are very similar to the Existing Allocation, with minor changes in the "Storage," "Other," and "Project Use Power"

components. Table V-16 shows that changes in costs for the irrigation water rate components in both the Proportional Alternative and Contractors' Proposal relate primarily to changes in the "Storage" and "Conveyance" components, with limited changes to the "Other" and "Project Use Power" components.

TABLE V-15
SUMMARY OF M&I RATE COMPONENTS IN ALL
ALTERNATIVES
(\$ MILLION)

RATE COMPONENT	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE		CONTRACTORS' PROPOSAL	
	COST	TOTAL COST	CHANGE FROM EXISTING	TOTAL COST	CHANGE FROM EXISTING
Storage	75.6	71.4	-4.2	73.3	-2.3
Conveyance	286.4	286.4	0.0	286.0	-0.4
Conveyance Pumping	3.1	3.1	0.0	3.0	-0.1
Direct Pumping	39.2	39.2	0.0	39.2	0.0
Other	8.3	11.2	2.9	10.3	2.0
Project Use Power	17.5	17.8	0.3	16.5	-1.0
San Luis Drain	0.0	0.0	0.0	0.0	0.0
Subtotal Used in Setting Rates	430.2	429.1	-1.0	428.3	-1.9
Repayment Contracts for Distribution Systems	6.4	6.4	0.0	6.4	0.0
TOTAL	436.5	435.5	-1.0	434.6	-1.9
Notes:					
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.					
Totals may not be completely accurate due to rounding.					

TABLE V-16
SUMMARY OF IRRIGATION RATE COMPONENTS IN ALL
ALTERNATIVES
(\$ MILLION)

RATE COMPONENT	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE		CONTRACTORS' PROPOSAL	
	COST	TOTAL COST	CHANGE FROM EXISTING	TOTAL COST	CHANGE FROM EXISTING
Storage	341.5	383.8	42.3	327.3	-14.2
Conveyance	471.3	445.6	-25.7	459.0	-12.4
Conveyance Pumping	45.6	45.6	0.0	43.9	-1.7
Direct Pumping	107.0	107.0	0.0	107.0	0.0
Other	40.4	49.1	8.6	44.8	4.4
Project Use Power	109.5	111.9	2.4	100.6	-9.0
San Luis Drain	46.5	46.5	0.0	46.5	0.0
Subtotal Used in Setting Rates	1,161.8	1,189.4	27.6	1,129.0	-32.8
Repayment Contracts for Distribution Systems	314.4	314.4	0.0	314.4	0.0
TOTAL	1,476.2	1,503.8	27.6	1,443.4	-32.8
Notes:					
Costs based on the 1999 CVP Interim Cost Allocation Annual Update.					
Totals may not be completely accurate due to rounding.					

Consistent with the relatively small changes in the M&I water users repayment responsibility shown in Table V-14, it can be seen from Table V-15 that the changes in costs associated with the M&I water rate components are relatively minor. From Table V-16, it can be seen that costs associated with the irrigation water rate components either do not change or increase for the Proportional Alternative, with one exception, and either do not change or decrease for the Contractors' Proposal, again with one exception. The entire reduction of almost \$26 million in the "Conveyance" component of the Proportional Alternative results from the change in the

allocation factors for the Tehama-Colusa Canal, with a cost of \$81 million, and Tehama-Colusa Canal Fish Facilities, with a cost \$43 million. Both facilities are classified as "Conveyance" for ratesetting purposes. In the Existing Allocation, the costs of these facilities are allocated using separable cost factors from the 1975 reallocation, and therefore these costs are considered joint costs in the Proportional Alternative. In the Existing Allocation, some 93 percent of the cost of the canal and 13 percent of the cost of the fish facilities are the repayment responsibility of irrigation. In the Proportional Alternative, on the other hand, only about 42

percent of the cost of the canal and 48 percent of the cost of the fish facilities are the repayment responsibility of irrigation. The net effect of these two changes is a reduction in the irrigation repayment responsibility of nearly \$26 million.

The “Other” component for both M&I and irrigation in the Contractors’ Proposal increases

because the environmental water account includes an element that would be considered mitigation. It would be entirely reimbursable and appears in this table for ratesetting purposes in the “Other” component.

Chapter VI

EVALUATION OF ALTERNATIVES

As previously discussed in Chapter II, the issue of CVP cost allocation was the subject of a special study completed in the 1940s while the first stages of the project were still under construction. In that study, which was never officially sanctioned, a combination of methods was used to allocate CVP costs. In completing the first official allocation of CVP costs in 1946, Reclamation also faced the issue of selecting a cost allocation method from among competing methods and utilized two different approaches – AJE and use of facilities – and averaged the results.

According to Document No. 146, 80th Congress, 1st Session, in which the 1946 allocation performed by Reclamation was published, the AJE and use of facilities were the two methods for which a reasonable claim to validity existed in application to the costs of the CVP. That the two methods produced results with few differences was accepted as proof of the approximate validity of each. Since it was thought that there was no sure way to choose between them, the final result was an average of the two.

As noted in Chapter II, the issue of the appropriate allocation method for use in Federal water resource projects was the subject of several investigations in the early 1950s, and in 1954, the COE, the Federal Power Commission, and the Department of the Interior announced that they would all consistently employ the same approach for cost allocations. The SCRB was considered preferable, but the AJE and use of facilities methods would also be permitted under special circumstances. Beginning with the first reallocation of CVP costs in 1956 and extending through the most recent reallocation study in 1975, Reclamation has followed this policy and used the SCRB method.

As a result, the allocation method applied to the CVP has become accepted as well as the water rates that stem from it. Although the various reallocation studies since that time utilized new data on benefits and costs and new facilities were included as construction was completed, the allocation method itself was never re-examined. In this cost allocation study, however, the appropriateness of the existing cost allocation has been raised as an issue. As described in Chapter IV, it is being addressed through the development of two new alternative allocation methods and the selection of one of them or the existing method as the recommended alternative.

In the sections that follow, criteria by which to evaluate alternative allocation methods are developed and applied to the alternatives. A recommended alternative is selected.

EVALUATION CRITERIA

During this study Reclamation has consulted several sources for guidance on criteria to be used to evaluate the cost allocation alternatives. Discussions with staff in other Reclamation regions, publicly owned utilities, and water districts confirmed that a cost allocation method is typically selected and usually applied during the planning phase of a project. For Reclamation the SCRB continues to be the preferred method for any new projects and the Commissioner's office approval must be obtained to use an alternative method. Major changes in cost allocation methodology are generally not contemplated following completion and long-term operation of major project features. As a result of the early cost allocations made for the CVP, different user groups were assigned a share of project costs. Long-term water and power contracts, and water

user expectations, are generally based on the original allocation of costs and on that same method being used to allocate additional costs. As additional costs are incurred by a project, such as major repairs or rehabilitation of existing facilities or additional facilities, there is likely an expectation and understanding that such additional costs will be treated in a similar manner unless otherwise specified in legislation. Usually, these periodic updates of the cost reallocation apply techniques similar to those used in previous cost allocations of the same project, and the issue of alternative methods is not raised. Thus, little if any, previous experience in developing evaluation criteria for the reallocation of major water projects is available for consideration.

The circumstances involved in this cost allocation study also differ from those typically encountered in cost allocation studies, which are conducted during project planning and development. At the start of project planning, no allocation exists, and the problem is that of developing one, including choice of the appropriate allocation method. For this study, an allocation does exist so that the relevant question is whether one or both of the alternative allocation methods presented in Chapter IV have characteristics that provide a compelling reason to change the existing method. The evaluation criteria applied in this study were formulated to address that question, and if the answer were affirmative for both alternatives, to provide guidance in the selection of one of them as the recommended method. The criteria were applied to determine whether the alternatives met the basic requirements for an interim cost allocation and to highlight differences between the existing allocation method and the alternatives. A summary of evaluation criteria is provided in Table VI-1.

APPLICATION OF EVALUATION CRITERIA TO ALTERNATIVES

The criteria described in Table VI-1 form the basis to evaluate the advantages and disadvantages of the existing allocation and the two alternatives considered in this study. The following sections describe the application of

the evaluation criteria to the alternatives and their ability to meet the criteria. For each criterion, alternatives are assigned an evaluation rating of “meets,” “does not meet,” or “partially meets” depending on the degree to which the criterion is met by the alternative.

Criterion 1 – Allocate Joint Costs Based on Project Benefits

A benefits-based allocation method links the allocation of costs and repayment responsibility of an entity to the level of accomplishments or services received by that entity. This approach is consistent with guidance applicable to Federal water projects across agencies, as referenced earlier.

As described Chapter III, the Existing Allocation uses joint cost allocation factors that were developed using the SCRB method in 1975. The 1975 reallocation study was prepared as a “short form” allocation that was based on the major 1970 reallocation, and the joint cost allocation factors from the 1975 study have been in use for nearly 25 years. These factors were established based on consideration of project benefits and costs for single purpose alternatives. Therefore, the Existing Allocation is assigned an evaluation of “meets” this criterion.

The Proportional Alternative allocates joint costs in proportion to the allocation of specific costs among project purposes, not on the basis of project benefits. Therefore, it is assigned an evaluation of “does not meet” this criterion.

The Contractors’ Proposal recommends use of the joint cost factors from the 1970 reallocation study rather than those from the 1975 study, which are used in the Existing Allocation. Issues raised by the Contractors’ Proposal concerning the use of the 1975 factors focus on the formulation of the single-purpose power alternative and the treatment of flood control benefits.

TABLE VI-1
CRITERIA TO EVALUATE
COST ALLOCATION ALTERNATIVES

CRITERION	DISCUSSION
1. Allocates joint costs based on project benefits.	The allocation of joint costs for multi-purpose projects should be based on a methodology that quantifies benefits for each purpose. This approach is consistent with guidance applicable to Federal water projects across agencies – guidance that identified the SCRB as the preferred method for the allocation of joint costs. Alternatives that allocate joint costs based on benefits would be ranked higher than alternatives that do not allocate joint costs based on benefits.
2. Adjusts repayment in response to changes in project operations.	This criterion evaluates the ability of an alternative to reflect changes in repayment in response to changes in project operations. Alternatives that adjust repayment in response to changes in water system operations would be ranked higher than alternatives that do not.
3. Applies accepted cost allocation standards.	The selected cost allocation alternative should utilize accepted cost allocation standards. Alternatives that apply accepted cost allocation standards would be ranked higher than alternatives that do not.
4. Consistent with past methods to allocate CVP costs and potentially suitable for use in the final allocation.	This criterion is intended to identify potential effects of adopting an interim allocation that would cause abrupt changes in repayment responsibility that may be reversed at some future time. This criterion also considers the potential application of a method for the final cost allocation. Methods that are more consistent with past allocations or less likely to cause abrupt changes would be ranked higher than those that do not.
5. Consistent with applicable laws, regulations, and Reclamation cost allocation guidance.	The selected method should comply with all governing laws and regulations regarding cost allocation for Reclamation projects in general and for the CVP in particular. Alternatives that comply with laws and regulations, and are consistent with Reclamation cost allocation guidance will be ranked higher than alternatives that do not.
6. Adaptive and able to accept new project features.	The CVP has not yet been deemed complete and additional project features are likely. As new project features are added, their costs must be allocated among project purposes. This criterion evaluates the effects that the costs of new project facilities would have upon the allocation of existing facilities. Alternatives that allow the addition of facilities that have new costs that are specific to only a single feature or features without leading to the reallocation of existing joint costs would be ranked higher.
7. Simplifies cost allocation process and allocation of joint costs.	This study is being undertaken, in part, in response to a GAO recommendation that the cost allocation process be simplified and streamlined. This criterion assesses whether an alternative would result in more streamlined updates than the allocation process in place at the time of the GAO review.
8. Implementation process	The selected alternative will be forwarded to the GAO. Some alternatives may require Congressional approval before implementation. This criterion describes the approval process that would be required for each alternative and is provided for information purposes. Since the implementation process is determined by existing laws and policies, no weight is assigned to this criterion.

In the 1970 study, a fossil fuel powerplant was used as the single-purpose alternative while the 1975 study used a nuclear plant. In both studies the Federal Power Commission provided energy and capacity values. The Contractors' Proposal notes that Reclamation's choice of nuclear power as the single-purpose alternative, in part, led to these changes in the values of the joint cost factors, particularly those for power and flood control. The single-purpose alternative should represent the most likely alternative that would have been constructed in the absence of a Federal hydropower project, and at the time the 1975 study was prepared, nuclear power was viewed as a viable power source. The Contractors' Proposal recognizes this situation. However, the proposal goes on to point out that events in the power field did not develop as assumed in the allocation study. Nevertheless, at the time of the study, nuclear power was considered viable. All energy costs were increasing in the early 1970s, including those of fossil fuels, so that it was to be expected that the cost of the single-purpose power alternative in the 1975 reallocation would be considerably greater than that used in the 1970 reallocation. This would serve to increase the joint cost allocation for power regardless of the nature of the single-purpose alternative used in the 1975 reallocation study. As described in Chapter IV, the justifiable expenditure for power more than doubled from the 1970 to 1975 study while the separable cost increased about two-thirds. The result was a significant increase in the remaining justifiable expenditure for power with a slight decline in the justifiable expenditure for flood control. Accordingly, the joint cost allocation for power increased and that for flood control fell somewhat while the joint factors for other project purposes experienced relatively minor changes.

Only a complete, new reallocation study that estimated project benefits, costs of facilities in service, and single-purpose alternatives could produce joint cost factors that would represent current conditions. And, even if one were performed, it would still leave questions as to how to integrate the results with past uses of project facilities and historic allocations used for repayment to date.

The Contractors' Proposal also notes that in the 1975 reallocation study, benefits and costs were brought to a common date of 1975, with the exception of flood control benefits. Flood control benefits were neither re-evaluated nor indexed to the 1975 price level. This is one reason why the joint cost allocation factor for flood control fell from 1970 to 1975 and, the Contractors' Proposal contends, therefore becomes a reason for advocating a return to the use of the 1970 joint cost allocation factors. However, historical communication from the COE indicates why a higher value was not used and was likely not justified. As a part of the 1975 reallocation study, Reclamation requested updated flood control benefits from the COE. The COE responded to Reclamation by letter of February 27, 1975, (included as Appendix C). In its letter the COE stated that it appeared that the effect of new hydrology developed since the previous flood control study, price level increases, and increased economic development would increase previously computed flood control benefits. However, in the same letter, the COE also stated that the guideline framework for COE flood control benefit studies had undergone extensive changes and that the effect of the changes would be to appreciably decrease (emphasis added) the benefits. The COE further stated that it had concluded that the net effect of the changes taken together would mean that "current flood control benefits would be at least equal to those previously supplied you in April 1969, but might not significantly exceed them." The COE letter recommended that Reclamation use the flood control monetary benefit values supplied by the COE for its 1970 reallocation study without any indexing. Reclamation did as the COE recommended, accepting the balancing of the two offsetting factors, and so flood control benefits were neither re-evaluated nor indexed.

In Chapter IV, it was noted that the Contractors' Proposal adopted Reclamation's approach to the allocation of Friant Dam and Reservoir used in its 1975 reallocation study by allocating Friant's costs only to water supply and flood control with no allocation to power since Friant has no power-generating facilities. It should also be noted that in all three allocation

alternatives under consideration some of the costs of the Trinity River Division are allocated to flood control, but Public Law 84-386, dated August 12, 1955, which authorized the division, did not include flood control as one of its authorized purposes. The appropriateness of such an allocation would have to be re-examined in any completely new reallocation study of the CVP.

The Contractors' Proposal includes the use of allocation factors that were developed in a SCRB analysis and is therefore assigned an evaluation of "meets" this criterion. As described in Chapter IV, joint cost allocation factors developed in a SCRB analysis reflect the distribution of justifiable expenditures to project purposes in proportion to the remaining justifiable expenditure after separable costs calculated for each purpose have been removed. It should be noted that the Contractors' Proposal uses less recent estimates (1970) than the Existing Allocation (1975), but it was still assigned an evaluation rating of "meets" this criterion.

Criterion 2 – Adjust to Changes in Project Operations

This criterion evaluates the ability of an alternative to reflect changes in cost allocation and repayment in response to changes in project operations. All three alternatives distribute costs allocated to water supply and power to irrigation, M&I, and commercial power for the repayment of reimbursable costs. For water supply, repayment responsibilities are based on total historic and projected deliveries throughout the lifetime of the CVP until the end of the repayment period, thereby allowing long-term trends to be recognized without imposing abrupt short-term changes in water and power rates. All three alternatives use the same factors to determine the repayment responsibilities for the power purpose, but differences appear in determining repayment responsibilities for the water supply purpose between the Existing Allocation and the Contractors' Proposal.

The Existing Allocation and Proportional Alternative determine repayment responsibilities

for the water supply purpose in the same way. They distribute the responsibility for water supply costs in proportion to total water deliveries to the three end uses. The end uses of water supply are irrigation, M&I, and wildlife refuges, and water deliveries are composed of both measured, historic use and estimated future deliveries. Typically, future deliveries are assumed to be either total contract amount or are gradually increased to the total contract amount as demand is anticipated to rise.

The Contractors' Proposal uses the same water deliveries for the three end uses that appear in the Existing Allocation, but adds a fourth category – the environment. As described in Chapter IV, the contractors justify adding the environment as a water use in this alternative to reflect changes in project operations as a result of the CVPIA, ESA, and Bay-Delta Plan. The Contractors' Proposal would establish the environment as an additional water use based on the quantity of water dedicated annually by the CVPIA to restore fish, wildlife, and habitat. The environment would begin as a water use in 1993, and ultimately the assumed use of water for environmental purposes would build up to 800,000 acre-feet per year. For 1999, the addition of this water would raise the total amount of water used to distribute water supply costs from about 260 million acre-feet over the entire repayment period – the value used in the Existing Allocation and Proportional Alternative – to about 282 million acre-feet over the same period in the Contractors' Proposal. The effect of including this water account is to assign a share of water supply costs to the environment.

In the Contractors' Proposal, water supply costs assigned to the environment would be partially reimbursable and partially non-reimbursable. From 1993 through 2006 – the period in the Contractors' Proposal when Stage I of the CalFed environmental restoration actions are planned to be completed – environmental water is considered mitigation, and all of the costs associated with this water supply would be allocated to water and power users and would be totally reimbursable by them. This proposal adopts a gradual buildup in what is labeled environmental water. This assumed schedule is

important because the proposal makes a portion of its cost non-reimbursable starting in 2007, as described below.

As described in Chapter IV and illustrated in Figure IV-1, beginning in 2007 and continuing through 2030, the costs associated with the environmental water account would be partially reimbursable and partially non-reimbursable, using a proposed formula. The formula specified by the Contractors' Proposal is adapted from the repayment requirements for certain other actions required of the CVP – namely, the several actions mandated in section 3406(b) of the CVPIA. Specifically, 37.5 percent of the water would be reimbursable, to be repaid by water and power users, and the remaining 62.5 percent of the water would be non-reimbursable from the perspective of water and power users.

The contractors' rationale for this is that the reimbursable portion (37.5 percent) would be considered mitigation with related costs to be repaid by water and power users while the remaining 62.5 percent of the water would be considered enhancement with related costs to be non-reimbursable from the perspective of water and power users. By the end of the CVP repayment period in 2030, when the environmental water account would have increased to 800,000 acre-feet per year on a schedule provided in the Contractors' Proposal, the costs associated with 300,000 acre-feet, representing 37.5 percent of the 800,000 acre-feet, would be repaid by water and power users and the costs associated with the remaining 62.5 percent would be non-reimbursable.

There are several reasons to reject this line of reasoning. First, section 3406(b)(2) of the CVPIA does not state that any of the dedicated 800,000 acre-feet of water is for enhancement. As noted in Chapter II, the dedicated water is primarily for habitat "restoration" purposes – a term that suggests mitigation, not enhancement. In addition, section 3406(b)(3) of the CVPIA requires implementation of a program to supplement the quantity of water dedicated in section 3406(b)(2). This indicates that the CVPIA did not contemplate that the dedicated water would meet all the environmental goals

enumerated in section 3406(b)(2). Mitigation, protection, and restoration must precede enhancement, and it is unlikely that the 800,000 acre-feet alone could completely mitigate, protect, and restore, and therefore that any portion of it could be considered enhancement. Additionally, the CVPIA does not specify that the cost allocation of the CVP should be modified to accommodate the 800,000 acre-feet dedicated annually by section 3406(b)(2), that a cost should be assigned to this water, nor that some portion of such cost should be non-reimbursable. Rather, the CVPIA treats this water as a required priority use of project water and implicitly an obligation of the water contractors.

It could also be noted that the provisions of the CVPIA from which the repayment formula in the Contractors' Proposal is borrowed do not state that 62.5 percent of the benefits of each measure is considered environmental enhancement and that 37.5 percent is mitigation. And, even if the repayment formula from those sections of the CVPIA were applied, it would require the State to 37.5 percent of the costs, which is not a part of the Contractors' Proposal.

Next, the assumption in the Contractors' Proposal that enhancement would begin in 2007 because the restoration/mitigation actions under Stage 1 of the CalFed program would be complete is not supportable. CalFed actions do not equate to CVPIA actions, and it cannot be assumed that actions taken by CalFed would fully satisfy CVP-specific mitigation, protection, and restoration needs articulated in the CVPIA. Furthermore, CalFed in its Programmatic Record of Decision, dated August 2000, makes no claims that its Stage I actions would, or are intended to, provide complete mitigation or that subsequent environmental actions would constitute enhancement. Finally, Stage I restoration/mitigation actions may not be completed by 2006.

Third, while the distribution of water supply costs in the Existing Allocation and the two alternatives allows changes in project uses to be reflected in the cost allocation, the Contractors' Proposal's treatment of the environment as a

new water use is not justified for other reasons. The three water supply functions in the Existing Allocation are all end uses – M&I users, irrigators, and wildlife refuges. The “environment,” on the other hand, as used in the Contractors’ Proposal, is not an end use in the same sense that M&I, irrigation, and wildlife refuges are end uses. Environmental water released from CVP reservoirs for instream environmental benefits could also be used for other beneficial purposes, including irrigation or M&I uses, farther downstream. In such cases, the Contractors’ Proposal would double count the use of water.

Underlying the Contractors’ Proposal are the assertions that form the basis for proposing the environment as a water use, namely, that the authorized purposes of the CVP have been greatly expanded and that the CVPIA established the environment as a new project purpose. Fish and wildlife considerations, however, have long been a responsibility of water projects developed by Reclamation and other Federal agencies as a result of the Coordination Act and its various amendments. The original act, passed in 1934, required that projects impounding water consider use of project water for fish culture and migratory bird habitat, and provision of fish passage past dams. The 1946 amendment to the act required that agencies impounding or diverting water consult with the Service with the view to preventing loss of and damage to wildlife resources, and that consistent with the primary project purposes, provide for conservation, maintenance, and management of fish and wildlife and their habitats. In recognizing the importance of fish and wildlife resources and increasing public interest, the 1958 amendment provided that wildlife conservation should receive equal consideration and be coordinated with other project features through effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation.

Authorizations of components of the CVP and reauthorizations of the entire CVP have also addressed consideration of fish and wildlife and their habitats. Public Law 83-674, dated August

27, 1954, reauthorized the CVP to include the use of CVP water for fish and wildlife purposes, subject to priorities contained in previous authorizations, via development and maintenance of waterfowl management areas. The Trinity River Division authorizing legislation required adoption of appropriate measures to insure the preservation and propagation of fish and wildlife. Public Law 87-874, dated October 23, 1962, reauthorizing the New Melones Project, also required the adoption of appropriate measures to insure the preservation and propagation of fish and wildlife. The authorization of the San Felipe Division by Public Law 90-972, dated August 27, 1967, included the conservation and development of fish and wildlife resources in accordance with the Federal Water Project Recreation Act.

In summary, the Coordination Act required provision for fish and wildlife resources in connection with the development and operation of water projects such as the CVP as far back as 1934. Various CVP authorizations and reauthorizations have expressed the intention to promote the preservation, propagation, and development of fish and wildlife resources. Major fish and wildlife mitigation measures implemented in the CVP prior to enactment of the CVPIA include the Coleman National Fish Hatchery, minimum flow specifications for the Trinity River, Clear Creek, and lower American River, prescribed operation of the gates at the Red Bluff Diversion Dam, fish spawning channels within and adjacent to the Tehama-Colusa Canal, and a fish salvage facility at the Tracy Pumping Plant.

In addition to Federal law, Reclamation operates the CVP in accordance with State law. However, for a considerable period of time there was a disagreement concerning exactly how this responsibility was to function. It was the Federal position that Reclamation projects were operated pursuant to Federal law and that it was a matter of comity that Reclamation had applied for water rights from the State. Reclamation also held that it operated the CVP to meet water quality standards that were implicit in the objectives of the project pursuant to Federal law

and that State water law had no authority over a Federal project. In *U.S. vs. California*, the U.S. Supreme Court in 1978 held that Reclamation projects are subject to State water law absent a clear Congressional directive to operate otherwise. Section 3406(b) of the CVPIA reinforced this by requiring the Secretary to operate the CVP to meet all obligations under State and Federal law and all decisions of the SWRCB establishing conditions on applicable licenses and permits of the project. Section 3406(a)(4) of the act amended the 1937 CVP authorization by adding the following language, “Nothing in this title shall affect the State’s authority to condition water rights permits for the Central Valley Project.” Decisions of the SWRCB have made it clear that all CVP water rights are junior to inbasin needs, including needs within the Delta itself, and that the CVP can only export water from the Delta that is surplus to inbasin needs. Over time, the levels of Delta outflow considered necessary to protect fisheries and the environment have increased and higher instream flow regimes have been adopted or agreed to by Reclamation, imposed by the SWRCB, or required via species listings under the ESA. These actions have influenced not only CVP operations in the Delta, but also the nature of CVP water rights, obligations of CVP contractors, and obligations of other water users.

Seen in this context, the CVPIA reinforced the obligation of the CVP to protect the environment by re-emphasizing the priority of meeting environmental needs, but did not add the environment as a new project purpose.

In summary, all three alternatives utilize a similar approach to adjust the repayment of water and power costs as water and power uses change. The Existing Allocation and the Proportional Alternative are based on measurable water deliveries to end uses and are assigned an evaluation of “meets” this criterion. By contrast, the Contractors’ Proposal’s inclusion of the environment as an additional water use – the 800,000 acre-feet of water dedicated by section 3406(b)(2) – introduces a very questionable element to the allocation computations from several perspectives,

including long-standing historical mandates in Federal legislation and State water rights rulings. Therefore, the Contractors’ Proposal is assigned an evaluation of “partially meets” this criterion.

Criterion 3 – Apply Accepted Cost Allocation Standards

The Existing Allocation uses joint cost factors based on the SCRB method, which is the established and accepted cost allocation approach for Federal multi-purpose water projects. Therefore the Existing Allocation is assigned an evaluation of “meets” this criterion. The Proportional Alternative allocates joint costs in proportion to specific costs. This approach has not been applied to multi-purpose water projects for the reasons described below.

In the Proportional Alternative, joint costs are allocated in proportion to the costs of single-purpose facilities in the constructed project, i.e., the specific costs – a method very similar to cost accounting methods used by private business. A key disadvantage to this alternative is that no single-purpose facilities have been constructed for three of the authorized purposes of the CVP – flood control, navigation, and water quality. Therefore, if followed to the letter, this method would allocate no costs to flood control, navigation, or water quality. To partially address this deficiency in the Proportional Alternative, for the purpose of evaluation in this study, an estimate of “specific” costs for flood control was made based on the proportion of total reservoir storage authorized for flood control as described in Chapter IV. No attempt was made to identify specific costs for navigation or water quality. Even with this assumption, however, the Proportional Alternative results in a lower allocation to flood control than either the 1970 or 1975 cost allocations that were based on the SCRB method.

The Proportional Alternative is not well suited to accept future additions of single-purpose project features. Under this alternative, future additions of single-purpose facilities, the costs of which are specific costs, would affect the allocation of joint costs of existing facilities.

This would occur even if the new facility resulted in no change in those project benefits which stemmed from the joint facilities. Further discussion of these effects is found under Criterion 6 below. Because the Proportional Alternative would radically change the methodology to allocate joint costs, it “does not meet” this criterion.

The Contractors’ Proposal uses accepted SCRB-derived joint cost allocation factors, but introduces the environment as a water user to provide a surrogate estimate of benefits. As discussed under Criterion 2, the environment, apart from water delivered to wildlife refuges, is not an end use of the 800,000 acre-feet of water used in this alternative, and “environmental protection” is not a new use of project water. As also noted under Criterion 2, the Contractors’ Proposal could result in double counting of water in those cases where some of the water satisfying environmental purposes is used further downstream for M&I and irrigation.

This establishment of the environment as a water user to allocate project costs is not based on standard practices. Therefore, the Contractors’ Proposal “partially meets” for this criterion.

Criterion 4 – Consistency with Past CVP Cost Allocation Methods

The selection of an allocation method should consider consistency with past methods used to allocate CVP costs and the potential to cause abrupt changes in annual repayment responsibilities over the remainder of the repayment period. As described in Chapter II, the CVP has been in operation for over 50 years. During this time, water and power users have made numerous financial and management decisions based on actual and anticipated costs. An abrupt change in repayment requirements, resulting from a significant change in the cost allocation method, could create unintended consequences, such as dramatically changing water and power rates. The adoption of an allocation method that causes these consequences, particularly one that may have to be modified at some future time if the changes to

the cost allocation method were reversed, is not preferred. Continuation of the Existing Allocation clearly would not cause abrupt changes in repayment responsibilities and would allow future changes to be made without having to reverse a change implemented at this time. Therefore, the Existing Allocation “meets” this criterion.

As described under Criterion 3, the Proportional Alternative introduces a radically different approach to the allocation of joint costs from that based on a SCRB allocation. In this alternative, joint costs would be allocated in proportion to the costs of single-purpose facilities in a manner similar to cost accounting methods used by private business. Because the Proportional Alternative would radically change the methodology to allocate joint costs, and would subject allocation of existing joint costs to changes in future specific costs it “does not meet” this criterion.

The Contractors’ Proposal would provide some consistency with past practices but also introduce two changes. First, the adoption of joint cost allocation factors from the 1970 allocation would significantly lower the repayment obligation for commercial power and increase the allocation of costs to flood control, which is non-reimbursable. As stated in the discussion under Criterion 1, there were good reasons for not making these changes. It is not known if the flood control and power benefits from 1970 are more accurate today or over the years between 1975 and today than the benefits developed for these purposes in 1975. An updated estimate of project benefits for all project purposes would be required to make such a determination and even after such a determination were made, it would still leave questions as to how to integrate the results with past flood control and power benefits, past allocations, and past repayments.

The second area of concern regarding the Contractors’ Proposal is the addition of the environment as a water use in the determination of repayment obligations for costs allocated to water supply. As described under Criterion 2, the Contractors’ Proposal would establish up to

800,000 acre-feet per year for environmental uses and defines the percentages of that water that are considered reimbursable (37.5 percent) and non-reimbursable (67.5 percent), percentages not applied by the CVPIA to this dedication of water. The annual quantities for irrigation, M&I and wildlife refuges are based on historic and projected deliveries. Each year water deliveries for those purposes are updated to reflect the conversion of one year of projected to historic deliveries and incorporate any changes in projected deliveries. The Contractors' Proposal, however, fixes the percentages applied to the environmental water to determine reimbursability while the quantities and reimbursability of the other water can change from year to year. Furthermore, the proposal assumes the Stage I CalFed mitigation actions would be completed by 2006, but does not address how the repayment of costs for environmental water would be adjusted if mitigation were not complete by then. Thus, it is likely that additional unknown, and possibly unanticipated, changes to this approach would be necessary in the future, creating potential instability in the application of this method.

As shown in Chapter V, the Contractors' Proposal would result in a reduction in water and commercial power repayment obligations. Because both of the key elements of the proposal – adoption of 1970 joint cost allocation factors and introduction of an environmental water account – are subject to future review, modification, and even potential reversal, it is possible that an abrupt increase in future water and commercial power repayment obligations and repayment rates could occur with the adoption of this alternative. Nevertheless, because the Contractors' Proposal utilizes the SCRIB method, it “partially meets” this criterion.

Criterion 5 – Consistency with Laws, Regulations, and Guidance

As described in Chapter II, the initial phase of this study included a thorough review of the Existing Allocation to assure compliance with all laws, regulations, and guidance. Allocation spreadsheets were modified to reflect these corrections, which have been applied to the 1999

updated allocation. The revised spreadsheets were also used in this study to evaluate the Existing Allocation, the Proportional Alternative, and the Contractors' Proposal. The Existing Allocation “meets” this criterion. The Proportional Alternative and Contractors' Proposal, however, present some conflicts with existing laws, regulations, and guidance.

For projects with multi-purpose features such as the CVP, the SCRIB method is the established and accepted method although other methods, such as AJE, can be used under special circumstances. In an attempt to streamline the cost allocation process, the Proportional Alternative abandons a benefits-based allocation method in favor of a method that relies on more easily determined cost factors alone.

The use of the specific costs of single-purpose facilities in the Proportional Alternative to develop factors to be used to allocate joint costs is not consistent with Reclamation cost allocation policy and guidance, as referenced above. As discussed under Criterion 3, this method introduces a radically different approach to the allocation of joint costs from that used in the SCRIB. Even with assumed flood control benefits based on dedicated reservoir space, the Proportional Alternative results in a lower allocation to flood control than either the 1970 or 1975 cost allocations that were based on the SCRIB method.

The creation of the environment as a water use in the Contractors' Proposal departs from Reclamation cost allocation policy and guidance. As described in Chapter II, the 1970 CVP reallocation study adopted an allocation to water supply with repayment obligation distributions to water use functions based on proportionate historic and projected water deliveries to each function. This approach, which was re-affirmed in the 1975 allocation, was adopted so that adjustments for future changes in project operations could be more readily accommodated. The amount of water assigned to the environment in the Contractors' Proposal is not based on delivered water or on otherwise measured water quantities. Rather, this method adds a somewhat arbitrary amount

to historic and projected water deliveries for the irrigation, M&I and wildlife refuge water use functions. This approach is not consistent with existing Reclamation cost allocation guidance; may result in double counting, as described under Criterion 2; and conflicts with applicable law, as described under Criterion 2 and discussed in more detail below.

The Contractors' Proposal creates an environmental water account based on assumptions concerning or interpretation of the 800,000 acre-foot quantity of water in section 3406(b)(2) of the CVPIA. In the Contractors' Proposal, this quantity starts at 531,000 acre-feet in 1993 and is increased to 800,000 acre-feet annually in the year 2030. In the proposal, the costs of 100 percent of this amount of water is treated as reimbursable between the present and 2006, on the rationale that this water is used entirely for mitigation until that time. Starting in 2007, the proposal designates 62.5 percent of this water as non-reimbursable and 37.5 percent as reimbursable, and, in effect, treats 62.5 percent of the water as being for environmental enhancement and 37.5 percent for mitigation. As described under Criterion 2, the CVPIA does not specify that the cost allocation for the CVP should be modified to reflect the dedication of the 800,000 acre-feet of water, that a cost should be assigned to this water, nor that some portion of any such cost should be considered non-reimbursable. Rather, the CVPIA treats this water as a required priority use of project water and implicitly an obligation of the water contractors. This is similar to the way in which the CVPIA treats the costs of purchasing additional water to help meet the same environmental objectives. Surcharges of \$6 and \$12 per acre-foot (indexed each year) are to be paid by water contractors, and preference power customers are also levied a surcharge in their power rates. The fact that additional water is to be purchased also means that the 800,000 acre-feet of water is not sufficient to satisfy all of the mitigation, protection, and restoration requirements of the act by the year 2007.

It is also noteworthy that, although the CVPIA is specific on allocations for costs in other sections, it makes no mention of cost

allocation or reallocation under section 3406(b)(2). Nevertheless, the contractors' interpretation of this section is that Reclamation should make an allocation of costs to this water and that some of the costs should be non-reimbursable, according to the following formula.

As discussed under Criterion 2, the Contractors' Proposal assumes that the repayment formula of 37.5 percent reimbursable and 62.5 percent non-reimbursable that appears in many of the actions required by sections 3406(b)(4)-(22) of the CVPIA should be applied to the 800,000 acre-feet of water. Reclamation has concluded that if Congress had intended that a cost be assigned to the 800,000 acre-feet of water and that a portion of that cost be non-reimbursable, then specific language to that effect would have been provided in the legislation.

Section 3406(b)(1) of the CVPIA states, "... That the programs and activities authorized by this section shall, when fully implemented, be deemed to meet the mitigation, protection, restoration, and enhancement purposes established under Section 3406(a) of this title." Many of the provisions included in the referenced section (3406) include specific repayment formulae. Since no such cost assignment or reimbursement formula was provided for the 800,000 acre-feet in section 3406(b)(2), its use is considered mitigation and any costs attributable to it are considered reimbursable in total. The creation of the environment as a water use therefore introduces into the cost allocation an element that is insupportable either in existing Reclamation cost allocation procedures or law.

In summary, although the Proportional Alternative complies with laws and regulations, it uses an allocation method that is not consistent with Reclamation cost allocation guidance. Therefore, the Proportional Alternative "partially meets" this criterion. In light of the above-described inconsistencies with historic and recent laws, regulations, and guidance, the Contractors' Proposal "does not meet" this criterion.

Criterion 6 – Adaptive and Able to Accept New Project Features

The CVP is not complete, and additional project features are likely to be added in the future. This criterion evaluates the effects that the costs of new project facilities would have on the allocation of existing facilities.

The Existing Allocation is based on a feature-by-feature analysis that has been developed over the past 40 years. The allocation has been frequently updated and in some cases modified to accommodate the addition of new facilities, changes in repayment policies, and to reflect increased capital expenditures for the expansion, replacement, or repair of existing facilities. Each facility, whether it is a single-purpose or multi-purpose feature, is treated individually in the allocation and repayment computations, allowing facility-specific details to be incorporated without affecting the allocation of other features. Therefore, the Existing Allocation “meets” this criterion. The Contractors’ Proposal can also accept new features in a manner similar to the Existing Allocation and therefore also “meets” this criterion.

The Proportional Alternative is not well suited to accept future additions of single-purpose project features. Under this alternative, future additions of single-purpose facilities, the costs of which are specific costs, would affect the allocation of joint costs of existing facilities. This would occur even if the new facility resulted in no change in those project benefits which stemmed from the joint facilities.

As an example, if major rehabilitation or replacements were made to a canal (water supply) or powerplant (power), such as replacing a lining or rewinding a turbine, the total investment in these single-purpose facilities would increase. Although costs would be incurred simply to maintain or restore existing capacity, the increase in specific costs allocated to the purpose in question would change the percentage distribution of specific costs among all project purposes, and since joint cost allocation factors are derived from the

distribution of specific costs, they too would change. For instance, major rehabilitation on the Madera Canal, a single-purpose facility conveying irrigation water only, would cause an increase in the allocation of specific costs to the entire water supply purpose. In turn, although no other specific costs would have changed, the altered percentage distribution of specific costs to all project purposes would change the allocation of joint costs; namely, the percentage of joint costs allocated to water supply would increase and the percentage allocated to all other purposes would decrease.

In this hypothetical example of rehabilitation of the Madera Canal, the allocation of costs and repayment obligations for all CVP multi-purpose facilities, such as Shasta Dam and Reservoir, would change. The allocation to the water supply purpose would increase, as would the repayment obligations of all water supply functions; the costs allocated to all other purposes sharing joint costs would decline. It would appear unreasonable to expect expenditures on the Madera Canal to increase the repayment obligation of M&I water users and decrease the repayment obligation of commercial power customers when nothing had been done to any facilities they directly utilize. By contrast, under both the Existing Allocation and the Contractors’ Proposal, an increase in the costs of the Madera Canal would increase only the allocation of costs to the water supply purpose. The conveyance component of the irrigation repayment obligation would increase by the full amount of the increase in cost.

Since the addition of single-purpose project facilities would alter the allocation of costs for all facilities with joint costs, the Proportional Alternative “does not meet” this criterion.

Criterion 7 – Simplify the Cost Allocation Process

As stated in Chapter I, this study is being undertaken, in part, in response to recommendations from the GAO that the cost allocation process be simplified and streamlined. The development and use of updated allocation tools under the existing method has significantly

reduced the effort and time needed to complete annual updates. Therefore, this objective has been met, at least in part, by Reclamation. These spreadsheets are applicable to all methods.

This criterion also addresses whether an alternative utilizes a method that simplifies the allocation of joint costs. In both the Existing Allocation and the Contractors' Proposal, the allocation of joint costs is based on previously calculated joint cost allocation factors. These factors would not be changed unless a new benefits-based cost allocation were completed, which would be a time-consuming and labor-intensive effort. The continued use of existing SCRB-derived joint cost allocation factors does not introduce complexity to the annual update process.

The Proportional Alternative would likely involve a recalculation of joint cost allocation factors each year if total capital investment for any project purpose changed (note the discussion of the impacts of adding specific costs under Criterion 6). Although this process has been automated, it might be necessary to describe the detailed derivations of the factors to adequately disclose the causes of changes in the factors. The additional effort to provide this information is considered minimal.

The annual effort required to prepare the Contractors' Proposal would be similar to that required for the Existing Allocation under the assumption that the yearly build-up of the environmental water account remains as presented in the proposal. Accommodating any changes in the account based on results of other calculations would require minor effort.

All three alternatives would result in approximately the same effort to complete annual updates of the cost allocation. The Existing Allocation and Contractors' Proposal would require significantly greater effort if and when a new allocation is undertaken although this work would not be initiated by the selection of either of these alternatives. Therefore, for the comparison of the three alternatives considered in this study, each of the three alternatives is

assigned an evaluation rating of "meets" this criterion.

Criterion 8 – Implementation Process

Although the expediency or complexity of the process to implement an alternative does not justify its selection or rejection, each alternative considered in this study may require different levels of approval. These are discussed below, but no weight is assigned to this criterion.

Regardless of the results and recommendations of this study, the report will be forwarded to the GAO to respond to the recommendations contained in its 1992 report. Requirements to submit this study for further approval are provided by the Department of Energy Organization Act. That act requires that any reallocation of joint costs of multi-purpose facilities be subject to Congressional approval of some form.

The Existing Allocation does not involve a change in the allocation of joint costs, and therefore would not require Congressional approval. Both the Proportional Alternative and the Contractors' Proposal involve changes in the allocation of joint costs. Therefore, the selection of either of these alternatives could require Congressional approval in some form.

EVALUATION SUMMARY

As summarized in Table VI-2, the Existing Allocation "meets" all seven criteria; the Proportional Alternative "meets" two criteria, "partially meets" one criterion, and "does not meet" four of them; the Contractors' Proposal "meets" three criteria, "partially meets" three others, and "does not meet" one of them. On the basis of the evaluation, the Existing Allocation is selected as the recommended allocation.

**TABLE VI-2
COMPARISON OF COST ALLOCATION ALTERNATIVES**

CRITERION	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE	CONTRACTORS' PROPOSAL
Allocate joint costs based on project benefits	MEETS Benefits-based approach Allocates joint costs based on SCRB completed in 1970 and updated in 1975.	DOES NOT MEET Not a benefits-based approach for joint costs Allocates joint costs in proportion to single-purpose expenditures.	MEETS Benefits-based approach Allocates joint costs based on SCRB completed in 1970.
Adjusts to changes in project operations	MEETS Water supply and power repayment responds to changes in water deliveries to end users.	MEETS Same as existing allocation	PARTIALLY MEETS Water supply and power repayment responds to changes in water deliveries to end users and estimated amount of water dedicated to in-stream environmental purposes. The environmental water use assumes that no more than 3/8 of the 800,000 af is needed to accomplish the mitigation goals of the CVPIA; that mitigation is complete by the year 2007 based on objectives stated in CALFED; and that beginning in 2007, up to 5/8 of the 800,000 af is used for fish and wildlife enhancement and therefore represents a non-reimbursable water use.
Applies accepted cost allocation standards	MEETS SCRB is accepted method to allocate costs of Federal multi-purpose projects.	DOES NOT MEET Allocation of joint costs is similar to an accounting technique used to distribute overhead costs.	PARTIALLY MEETS SCRB is accepted method to allocate costs of Federal multi-purpose projects. Use of environment as water user is not based on standard practices, may double count water use, and is not consistent with the CVPIA.

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CRITERION	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE	CONTRACTORS' PROPOSAL
Consistent with past methods to allocate CVP costs and potentially suitable for the final allocation method	<p align="center">MEETS</p> <p>Use of SCRB factors to allocate joint costs is consistent with past CVP allocations.</p>	<p align="center">DOES NOT MEET</p> <p>Use of an essentially accounting technique introduces radically new methodology to allocate costs.</p>	<p align="center">PARTIALLY MEETS</p> <p>Use of SCRB factors to allocate joint costs is consistent with past CVP allocations.</p> <p>Creation of environment as water user is departs from established practice of accounting for delivered water only.</p>
Consistent with applicable laws, regulations, and Reclamation cost allocation guidance	<p align="center">MEETS</p> <p>Method has been analyzed to ensure consistency with applicable laws, regulations, and Reclamation cost allocation guidance.</p>	<p align="center">PARTIALLY MEETS</p> <p>Use of specific costs to allocate joint costs is not a benefits-based method and is not consistent with Reclamation allocation guidance.</p>	<p align="center">DOES NOT MEET</p> <p>The creation of the environmental as a water user is not consistent with Reclamation guidance provided for the 1970 allocation and reaffirmed in the 1975 allocation. This guidance states that water supply costs are to be sub-allocated among irrigation, M&I and wildlife refuge functions based on historic and projected water deliveries.</p> <p>Assumptions that 3/8 of the 800,000 af is needed to accomplish the mitigation goals of the CVPIA; mitigation is complete by the year 2007; and that up to 5/8 of the 800,00 af is used for fish and wildlife enhancement are not consistent with the CVPIA.</p> <p>The CVPIA does not provide for assigning a cost to the 800,000 af or for allocating such a cost.</p>
Adaptive and able to accept new project features	<p align="center">MEETS</p> <p>New facilities would be allocated on an individual basis and not affect the allocation of existing facilities.</p>	<p align="center">DOES NOT MEET</p> <p>The addition of new single-purpose facilities will affect the allocation of existing joint costs.</p>	<p align="center">MEETS</p> <p>New facilities would be allocated on an individual basis and not affect the allocation of existing facilities.</p>

CRITERION	EXISTING ALLOCATION	PROPORTIONAL ALTERNATIVE	CONTRACTORS' PROPOSAL
Simplifies cost allocation process	<p align="center">MEETS</p> <p>Recent improvements to cost allocation tools for the CVP have streamlined the annual update process, dramatically reducing the time and effort required.</p>	<p align="center">MEETS</p> <p>Utilizes improved tools developed for existing allocation method.</p>	<p align="center">MEETS</p> <p>Utilizes improved tools developed for existing allocation method.</p>
Implementation Process	<p>Forward report to GAO</p> <p>Congressional approval is not needed to continue use of existing joint cost allocation factors.</p>	<p>Forward report to GAO</p> <p>Report to Congress on results of GAO-recommended study would summarize findings.</p> <p>Change in joint cost allocation factors would require Congressional approval in some form.</p>	<p>Forward report to GAO</p> <p>Report to Congress on results of GAO-recommended study would summarize findings.</p> <p>Change in joint cost allocation factors could require Congressional approval in some form.</p>

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Chapter VII

CONCLUSIONS AND RECOMMENDATIONS

This study was undertaken to comply with the requirements of P.L. 99-546 and to respond to a recommendation by the GAO to consider a more streamlined method to allocate joint costs of the CVP. It reviewed a number of alternative allocation methods; developed, analyzed and compared in detail the allocation of CVP plant-in-service costs for two alternative methods to the existing allocation; and selected a recommended alternative. Early in the study, the existing allocation was reviewed and revised to assure consistency and compliance with legislation, policies, and agreements. In addition, a new spreadsheet was developed to streamline the annual update of the allocation of CVP plant-in-service costs. Subsequently, two alternative allocation methods were developed – a Proportional Alternative and Contractors’ Proposal. For each alternative, costs were allocated to project purposes and repayment responsibilities for irrigation water users, M&I water users, and commercial power customers were calculated.

To date, the total cost of CVP plant-in-service facilities is approximately \$3,290 million (1999 CVP interim cost allocation annual update). This amount represents total non-indexed costs incurred since construction of CVP facilities began. As noted in Chapter I, since costs specific to one project purpose, such as irrigation, are allocated to the purpose served, the central challenge of the allocation process is the allocation of joint costs – the costs of facilities serving more than one purpose; these amount to a total of about \$623 million (about 19 percent of total CVP plant-in-service costs). With the exception of the Tehama-Colusa Canal and associated fish facilities, the joint costs of the CVP are associated principally with storage facilities that were authorized and constructed from the late 1930s through the mid-1960s. Since that time, facilities constructed by Reclamation have been either single purpose with their costs allocated to the purpose for which the facilities were constructed or the facilities have had the allocation of their costs established by

authorizing legislation. Facilities constructed by the COE and integrated into the CVP have had their costs allocated by the COE. As the total plant-in-service investment has continued to rise with the addition of new features, the joint costs subject to allocation by Reclamation have become a smaller proportion of total project costs. Consequently, the effect of a change in the allocation of these joint costs, regardless of the percentages used, is lessened by both the magnitude of specific costs and the many repayment requirements that are not subject to change.

Evaluation and comparison of the alternatives required development of study-specific evaluation criteria because the circumstances involved in this cost allocation study differ from those typically encountered in cost allocation studies conducted during project planning and development. In planning studies, no allocation exists, and the problem is that of developing one, including choice of the appropriate allocation method. For this study, an allocation does exist so that the relevant question is whether one or both of the additional alternative allocation methods considered have characteristics that provide a compelling reason to change the existing method.

Evaluation criteria were formulated to address that question. Application of the criteria determined which alternatives met the basic requirements for an interim cost allocation and highlighted differences between the existing allocation method and the alternatives.

CONCLUSIONS

As described in detail in Chapter VI, the conclusion of this evaluation process is that neither the Proportional Alternative nor the Contractors' Proposal contains characteristics that support their selection as an interim cost allocation. The principal reasons supporting this selection are summarized below (for more detail, refer to Chapter VI).

Proportional Alternative

The Proportional Alternative would allocate joint costs in proportion to specific costs incurred for each project purpose in a manner similar to the distribution of joint, or overhead, costs by a private firm producing multiple products. This approach would not allocate joint costs in relation to benefits provided by the project. Another serious shortcoming of the Proportional Alternative is that future additions of single-purpose facilities, the costs of which are specific, would alter the allocation of costs for all existing facilities with joint costs even if the benefits derived from the facilities with joint costs did not change.

Contractors' Proposal

The Contractors' Proposal would allocate joint costs based on a determination of project benefits, but would utilize an older estimate of benefits than the Existing Allocation and would introduce the environment as a new water use. This alternative would replace the 1975 joint cost allocation factors used in the Existing Allocation with factors calculated in 1970. This change would be based primarily on the claims that the cost of the single-purpose power alternative in 1975 was biased by high energy costs at the time and that flood control benefits were understated because previous COE flood control benefit estimates were not indexed to then-current levels in the 1975 study. High energy costs were symptomatic of the period, and short of a new study, it is not clear there is a compelling reason for change. The COE flood control benefits were not indexed as a result of the recommendation by the COE, which appears, in this evaluation, to have been reasonable (for more detail, refer to Chapter VI).

In addition, the Contractors' Proposal would add the environment as a water use for the purpose

of calculating repayment responsibilities for costs allocated to the water supply purpose. The amount of environmental water would be based on the amount of water dedicated annually by section 3406(b)(2) of the CVPIA to restore fish and wildlife habitats and would be treated as an additional CVP water supply. Ultimately, according to the proposal, the amount of environmental water would build to 800,000 acre-feet per year. The Contractors' Proposal assumes that some of the costs associated with this water would be reimbursable, representing environmental mitigation, while the remainder, representing enhancement, would be non-reimbursable. As discussed in Chapter VI, the CVPIA does not indicate that any CVP costs are to be reallocated as a result this dedication of water and does not state that any of the dedicated water is for habitat enhancement purposes. In fact, the CVPIA includes provisions to acquire water through water purchases using the Restoration Fund in addition to the 800,000 acre-feet to help fulfill remaining mitigation, protection, and restoration needs and to enhance aquatic and wetland habitats. Furthermore, environmental water released from CVP reservoirs for instream environmental benefits could also be used downstream for other beneficial purposes, including irrigation or M&I uses, farther downstream. In such cases, the Contractors' Proposal could double count the use of water. Finally, the history of Federal legislation and SWRCB decisions clearly shows that maintaining environmental conditions is a requirement of the project and that water rights, including CVP water rights, are contingent upon meeting certain environmental priorities. Consequently, the Contractors' Proposal is not consistent with existing Reclamation guidance on allocating costs, nor with provisions of Federal Reclamation law and State water rights decisions.

RECOMMENDATIONS

Neither the Proportional Alternative nor the Contractors' Proposal includes characteristics that provide compelling reasons to change the existing allocation method. Accordingly, the Existing Allocation is selected as the recommended allocation alternative.

In the course of this study, alternatives to the

Existing Allocation were considered through detailed analysis of the two allocation methods and initial consideration of other potential allocation methods. These evaluations have led to the following two additional recommendations. First, joint costs should continue to be allocated using a benefits-based method. Since 1956, the joint costs of the CVP have been allocated using the SCRIB method, which is a benefits-based method. This method is the established method for Federal water resources agencies to allocate costs and is incorporated in Reclamation directives. For the CVP, the SCRIB method has been accepted as the basis for setting water rates for many decades, and the procedure for allocating the costs of existing and new project features has been incorporated into the expectations of water users. The SCRIB method

should continue to be employed as annual and other adjustments are made to the CVP cost allocation and should be the method used if any major new cost allocation study is performed.

Second, Reclamation should consider the requirements to complete a new cost reallocation study using the SCRIB method and an interim allocation of CVP costs based on new estimates of project accomplishments – including water supply, flood control, power, and fish and wildlife – benefits, and costs. It is expected that such a study would be time consuming and potentially costly. Therefore, before such a study were undertaken, an evaluation should be completed to identify what existing data are available for use, what new data would be required, and the levels of effort needed to develop new data and perform the analyses required for a new cost allocation study and how present benefits and costs would be integrated with former estimates of benefits and costs and contractor repayment. This evaluation would include coordination with other agencies that would be expected to provide input to a new allocation study – such as the COE and Service – to determine their ability and willingness to participate in it.

Appendix A

Cost Allocation Proposal

Introduction:

In November 1998 the U.S. Bureau of Reclamation (Reclamation) released a three volume set of documents entitled "Documentation of the Revised 1995 Plant-In-Service Interim Cost Allocation for the Central Valley Project" (hereafter referred to as the Baseline Allocation) for public review and comment. The Baseline Allocation was prepared in response to a recommendation by the General Accounting Office (GAO) to simplify the allocation process and to comply with the requirements of Public Law 99-546¹. During 1999, Reclamation held several public workshops, starting with one on February 4, 1999, to provide the public an opportunity to comment on the Baseline Allocation, and subsequent updates made by Reclamation.

In addition to the Baseline Allocation, Reclamation prepared a GAO-proposed cost allocation based primarily on the direct cost approach (an accounting method for allocating indirect costs). The latest version of the GAO-proposed method was presented for public review and comment on July 15, 1999. It is our understanding that Reclamation is still refining this method and plans to hold at least one additional public workshop to discuss the results.

A joint CVP cost allocation committee (the Committee) consisting of representatives of the Central Valley Project water and power contractors was formed shortly after the release of the Baseline Allocation. The Committee has submitted comment letters to Reclamation on both the Baseline Allocation (May 19, 1999) and the GAO-proposed method (August 13, 1999). Copies of these letters are included in the appendix for your convenience.

As part of the cost reallocation effort, Reclamation has solicited alternative cost allocation proposals from the CVP stakeholders and general public. This document contains the Committee's proposal for allocating the costs of the Central Valley Project.

Overview:

In developing the cost allocation proposal, the Committee examined various options ranging from proposing changes to the existing Baseline Allocation or GAO-proposed method to proposing that Reclamation perform a new cost allocation study from scratch using the Separable Costs Remaining Benefits (SCRB) or some other suitable economically based cost allocation methodology.

After analyzing the relevant issues surrounding the cost reallocation effort and obtaining policy guidance from water and power contractor management level representatives, the Committee concluded that the cost allocation proposal should build on Reclamation's efforts to revise the Baseline Allocation. In reaching this conclusion, the Committee recognizes the fact that the CVP has not yet been declared complete by the Secretary of the Interior and that any cost allocation study performed in the current period will be considered an interim allocation. Eventually, between now and the end of the project repayment period, a decision will need to be made as to whether a new cost allocation study is warranted in order to finalize the allocation of CVP costs. Until such time, the Committee believes that the Baseline Allocation with the proposed changes presented herein will provide for an equitable and cost effective basis for allocating the costs of the Central Valley Project. Additionally, the Committee believes that the

¹ Title I (Coordinated Operations) of PL 99-546, Section 102(c)(2) authorized and directed the Secretary of the Interior "to undertake a cost allocation study of the Central Valley project, including the provisions of this Act, and to implement such allocations no later than January 1, 1988".

proposed allocation will be easy to maintain and update; thereby satisfying the recommendations made by the GAO in their March 1992 report.

Issues of Concern:

Separable Cost Remaining Benefits Cost Allocation Factors:

The last major cost allocation study for the CVP was completed in 1970. A short-form allocation completed in 1975 primarily updated the prior 1970 data for the multipurpose facilities in "Base 1" including the Shasta, Trinity, Folsom, Friant and Delta facilities. In the 1975 short-form allocation, the type of power plants used as a basis to determine the benefits and single-purpose alternatives for the power project purpose were changed from fossil fuel plants to nuclear plants. This produced a 116% increase in the justifiable expenditure factor for power. In addition, the justifiable expenditure factor for water supply was increased by 83% due primarily to the indexing of costs. Meanwhile, the factor for flood control was left essentially unchanged except for the use of a different discount rate. The end result was a 287% increase in the Base 1 allocation factor to Power and a 3% increase in the Base 1 allocation factor to Water Supply. Conversely, there was a 43% decrease in the Base 1 allocation factor to Flood Control and an 11% decrease to Navigation (refer to Figure 1 below).

Comparison of CVP Allocation Percentages
Base I

	Water Supply	Power	F&WL Enh'mnt	Recreation	Flood Control	Navigation	Total
1969-70 Reallocation	54.18	5.63	1.92	0	36.12	2.15	100.00
1975 Reallocation	55.79	21.81	0	0	20.49	1.91	100.00
Difference	1.61	16.18	-1.92	0	-15.63	-.24	0.00
Percentage Change	+ 3%	+ 287%	- 100%	N/A	- 43%	- 11%	

Figure 1²

The separable and joint cost allocation factors developed in the 1975 short-form allocation for Base 1 have effectively been frozen and carried forward for all allocation updates performed since that time, including the Baseline Allocation currently under consideration. Several key issues to consider regarding the 1975 short-form allocation are described in the following sections.

Nuclear Resource as the Single Purpose Power Alternative

Defining and costing the Single Purpose Alternative (SPA) for each function of a project is a critical phase of the allocation process. The SPA serves as a limit on the benefits that can be attributed to a purpose and, as a result, establishes a ceiling on the amount of costs that can be allocated to the purpose.

² Compiled from Documentation of the Revised 1995 Plant-in-Service Interim Cost Allocation For the Central Valley Project, Volume 2 of 3, November 1998, Section 2, Attachments to letter to Central Files from Regional Economist dated March 8, 1976

In compiling the 1975 short-form allocation, Reclamation made the crucial decision to change its fundamental assumption with respect to the SPA for the power purpose. Instead of continuing to assume that a fossil fuel plant was the preferred SPA, the decision was made to change to a nuclear plant.

It is helpful at this point to gain a perspective on the world energy conditions leading up to the time of Reclamation's preparation of the 1975 short-form allocation. The decade of the 1970's was a period of significantly escalating energy prices. The Arab Oil Embargo of 1973-74 was a major cause for the disruption in the energy market. However, there were other factors as well. The Energy Information Administration of the Department of Energy describes the period effectively in its publication, The Changing Structure of the Electric Power Industry: An Update³. In a section entitled, "Years of Challenge: 1971-1984," it commented as follows:

During the 1970s, the electric utility industry moved from decreasing unit costs and rapid growth to increasing unit costs and slower growth. Among the major factors affecting the electric utility industry during the period were general inflation, increases in fossil-fuel prices, environmental concerns, conservation, and problems in the nuclear power industry.

First, electric utilities with ambitious capital expansion programs heavily financed by borrowing were particularly affected by inflation. As technical and regulatory requirements increased construction lead times, the impact of inflation was compounded.

Second, in the 1970s all fossil-fuel prices rose sharply. Petroleum costs more than doubled in 1974 alone and increased an average of over 26 percent a year for the 1970-1980 period. Natural gas prices, accelerated by decontrol under the Natural Gas Policy Act (NGPA, P.L. 95-621), rose by over 23 percent a year, with the largest increases occurring after 1978. Coal price increases averaged almost 16 percent a year.

Third, during the 1970s environmental legislation increased the costs of building and operating electric utility (particularly coal-fired) power plants. The Clean Air Act of 1970 (CAA, P.L. 91-604) and its amendments in 1977 (P.L. 95-95) required utilities to reduce pollutant emissions, particularly SO₂, causing increases in capital, fuel, and operating costs. The Act also limited use of tall stacks to disperse emissions. The Federal Water Pollution Control Act of 1972 ("Clean Water Act," P.L. 92-500) limited utility waste discharges into water. In addition, the Resource Conservation and Recovery Act of 1976 (RCRA, P.L. 94-580) directed standards for disposal of both hazardous and nonhazardous utility wastes.

Finally, conservation legislation effectively barred utilities from wider use of natural gas and petroleum. The Energy Supply and Environmental Coordination Act of 1974 (ESECA, P.L. 93-319) allowed the Federal Government to prohibit electric utilities from burning natural gas or petroleum. The 1978 Powerplant and Industrial Fuel Use Act (FUA, P.L. 95-620) succeeded ESECA and extended Federal prohibition powers. The National Energy Conservation Policy Act of 1978 (NECPA, P.L. 95-619) required utilities to provide residential consumers free conservation services to encourage slower growth of electricity demand.

In addition to the various energy-related issues that were a dominating influence, the period saw the beginning of high inflation rates that are without precedent in this century aside from that experienced in war times. Figure 2 depicts the historic pattern of the Consumer Price Index.

³ The Changing Structure of the Electric Power Industry: An Update, Updated May 30, 1997, Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels, http://www.eia.doe.gov/cneaf/electricity/chg_str/contacts.html

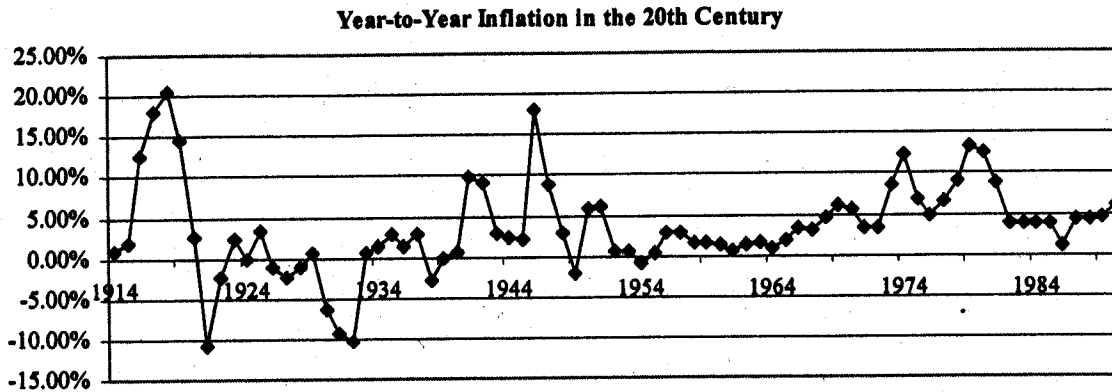


Figure 2⁴

It was against this backdrop that Reclamation had to examine the choice of a SPA for the power function of the CVP. Normally, a change in assumptions as dramatic as that from fossil fuel to nuclear as the basis for determining the SPA for power would not be appropriate for the five-year intervals in which the short-form allocation was performed. However, faced with the wide acceptance of nuclear power in the immediately preceding years, the alarming predictions of continued escalation in the cost of fossil fuels, and the environmental and other concerns that were surfacing, and presented with support from the Federal Power Commission, Reclamation economists were faced with the difficult decision. Understandably, they made the hard choice to revise the allocation, with the effect of increasing the cost of the SPA power cost by 116% over the amount used in 1970.

As it turns out, subsequent events did not play out as expected. The 1975 allocation was published in March 1976 and, within two years, nuclear power had disappeared entirely from the field of viable choices as an energy source in the U.S. Only four construction permits were issued for nuclear plants in 1977, only one was issued in 1978, and not a single one has been issued since then. Figure 3 depicts the dramatic reversal in popularity which the nuclear choice experienced after 1975.

**Nuclear Power Plants
Construction Permits Issued by Year**

1960	1	1971	3
1961	2	1972	5
1965	1	1973	10
1966	5	1974	12
1967	13	1975	7
1968	21	1976	6
1969	5	1977	4
1970	10	1978	1

No construction permits were issued after 1978

Figure 3⁵

⁴ Compiled from U.S. Bureau of Labor Statistics Consumer Price Index data.

<ftp://ftp.bls.gov/pub/special.requests/cpi/cpi.txt>

⁵ From NRC Information Digest (NUREG – 1350 Volume 9) Appendix A: US Commercial Nuclear Power Reactors

The aforementioned publication of the EIA records the events in the following commentary:

Expected high electricity demand growth did not materialize in the 1970s. Instead, capacity growth began to outrun increases in demand. For the first time in the history of U.S. electric power, electricity prices rose consistently, with nominal price increases averaging 11 percent a year. Consequently, demand and generation growth moderated to just over 4 percent a year. However, capacity growth continued at a rate of 6 percent a year. Slackened demand growth, coupled with completion of expensive new capacity, left utilities with excess capacity and without new revenues to pay for it. As a result, some electric utilities suffered financial setbacks and incurred declining investor confidence.

The commercial nuclear power industry expanded rapidly but also met serious reverses. From 1971 through 1974, 131 new nuclear units were ordered, at an average capacity of about 1,100 megawatts. Inflation and real labor and materials cost increases quickly affected construction costs of nuclear power plants, while high interest rates raised financing costs. Capital costs rose from about \$150 per kilowatt in 1971 to over \$600 after 1976. Utilities building commercial nuclear facilities faced financial difficulties in justifying and meeting these increased costs. Safety concerns increased. First, in February 1979 the Nuclear Regulatory Commission (NRC) shut down five operating reactors following concerns about durability during earthquakes. Then, on March 28, 1979, the Nation's most significant commercial nuclear accident occurred at the Three Mile Island Number 2 reactor near Harrisburg, Pennsylvania.

These events heightened public concerns and spurred opposition to commercial nuclear power. As a result of higher costs, slackening electricity demand growth, and public concern, demand for nuclear power plants dropped quickly in the mid- and late-1970s. After 1974, new orders plummeted and cancellations accelerated. No new reactor orders were placed after 1978. Moreover, 63 units were canceled between 1975 and 1980.

In addition to the fundamental assumption about the type of plant for a SPA, Reclamation also made some striking alterations in its assumptions about costs. The 1970 allocation had specified a capacity value, or plant cost, or \$11.67 per kilowatt per year. Although the available report of the 1970 allocation does not include details as to the development of this factor, it can be derived that on the basis of a 100-year amortization period and at an interest rate of 3.25% as described in the report, the capital cost of the fossil fuel plant used in the allocation was about \$344 per kilowatt of capacity. On the other hand, in the 1975 allocation, the cost of the nuclear SPA was based on a capacity value of \$36.00 per kilowatt per year. Using the same assumptions with respect to amortization period and project interest rate, this value suggests a plant capital cost of about \$1,062 per kilowatt of capacity. The alarming aspect of this data is that at \$1,062 per kilowatt of capital cost, the nuclear plant was far more costly than industry experience up to that point in time would suggest. The data in figure 4 depicts the capital costs incurred for plants placed in service in the 1970's:

Year	No. of Plants	Nuclear Power Plants Capital Cost of Plant Cost Range (\$/kW)		Average Cost (\$/kW)	Average Size (MW)
		Low	High		
1971	6	124	330	199	645
1973	20	112	482	260	821
1975	30	109	652	354	852
1977	14	197	720	413	925
1978	7	187	530	395	1030
1979	14	240	577	370	1020
1980	20	296	572	475	983

Figure 4⁶

⁶ From Power Generation - Resources, Hazards, Technology, and Costs, Philip G. Hill, © 1977 by The Massachusetts Institute of Technology, reprinted 1980, Table 7.2.

In comparison, fossil fuel plants were also experiencing increases in the capital cost of construction and, as described earlier, even more significant growth in fuel cost. Apparently, the economists were convinced that the cost of fossil fuels would continue to escalate at a pace that would allow the then-skyrocketing costs of the nuclear alternative to remain competitive.

Again, subsequent events did not occur as originally assumed. As an example, in precisely the same time frame that the 1975 allocation was being completed, Reclamation was participating in the construction of the Navajo power plant in northern Arizona, a coal plant to be used as the source for power for the Central Arizona Project. That 2,250 megawatt plant was completed in 1976 at a capital cost of about \$422 per megawatt. Forecasts being used in 1975 for other fossil fuel plants to be constructed in future years are shown in figure 5.

	Labor	Mat'ls & Equip	IDC	Contin- gencies	Total
800 MW Coal	159	194	85	106	685
800 MW Oil	140	152	71	96	459

Figure 5'

Procedures Used for the Allocation Update

In addition to the problems noted above relative to estimating the costs of power plant alternatives, the 1975 short-form allocation also has a significant technical flaw in the allocation principles used in developing the SPA for power. Because the CVP was constructed over such an extended period of time – from the late 1930's through about 1981 – the allocation process requires that all components of a cost allocation be placed on a common time frame. Reclamation chose to do this by indexing forward to 1975 the costs of the water supply components and certain other aspects of the allocation. It is important to note here that flood control was not indexed. With respect to power, the SPA and benefit calculations were made on the basis of entirely new operating criteria, not on the basis of indexing the cost of employing the old criteria. This approach allowed Reclamation to consider not only power generation technologies that were not available in an earlier time (i.e., nuclear), but to also consider environmental, regulatory, sociological, and other factors that influenced the selection and cost of alternatives. This can and did result in an unbalanced analysis, given that the other existing project purposes were evaluated based on criteria and assumptions from an earlier time period. In other words, the playing field was no longer level and the components of the allocation were no longer evaluated on a common time frame.

In the 1975 short form allocation it was only the power project purpose assumptions that, as described above, were subjected to modification in their fundamental assumptions. The water supply factors were changed primarily by the indexing of costs from 1968, which was the basis for the 1970 allocation, to 1975 cost levels. The benefit value for navigation was changed slightly, from \$1.26 million per year to \$1.5 million, and the discount factor was reduced from 3.25% to 2.75% to cause a total increase of \$12

⁷ From Power Generation – Resources, Hazards, Technology, and Costs, Philip G. Hill, © 1977 by The Massachusetts Institute of Technology, reprinted 1980, Table 7.3.

million in the capitalized navigation benefit. It is significant to note that no change was made in the value of annual flood control benefits between 1970 and 1975.

The end result, as illustrated in Figure 1 on page 2, was that the justifiable expenditures for water supply and power increased significantly, which caused the Base 1 allocation factors to increase 2 and 16 points, respectively, for water and power. At the same time the Base 1 allocation factor for flood control decreased by nearly 15 points. This action has the effect of shifting approximately 15% of the multi-purpose costs (Base 1 costs) from the non-reimbursable flood control function to the reimbursable power and water supply functions. To impose such an enormous shift in costs from non-reimbursable to reimbursable functions without conducting a new flood control benefit study is unreasonable and produces an inequitable allocation of costs.

Periodic Update of the Allocations

Had Reclamation's practice of performing a major cost allocation study every ten years and a short-form allocation at the five-year mid-point between major studies, been continued there would have been a major study performed in 1980 and again in 1990, with short-form allocations occurring in 1985 and 1995. Had these studies been completed, there would have been ample opportunity to revisit and overcome the inequities resulting from the 1975 short-form allocation. However, these periodic updates have never been performed. Consequently, the 1975 allocation has remained standing as the foundation of all subsequent allocations.

Recommendation

We recognize that the performance of a new cost allocation study is an expensive, time consuming process, and that it appears to not be economically feasible to undertake one at this time. We therefore propose that Reclamation return to the 1970 Separable Costs Remaining Benefits cost allocation factors until such time as a new study becomes warranted. It is important to note here that we were able to recompute the 1970 joint cost allocation factors using the available data without exception. Additionally, we were able to re-create the 1970 separable cost allocation factors from this same set of data.

The rationale for returning to the 1970 SCRB is as follows:

1. The 1970 SCRB represents the last time a major cost allocation study was performed. Although there is limited documentation on both the 1970 and 1975 SCRB's, we have reviewed the existing summary and detail information for the 1970 SCRB and have concluded that the underlying assumptions are reasonable.
2. Our analysis indicates that the power plant assumptions utilized in the 1970 SCRB are considerably more representative of power industry conditions existing throughout the decade of the 1970's than those used in the 1975 SCRB. Additionally, the 1970 power plant assumptions are more representative of subsequent periods after nuclear power was no longer a viable energy resource alternative and after the period of increasing spiraling energy prices ended.
3. The allocation of multipurpose costs to the flood control project purpose will be properly restored to a reasonable and equitable level. Partial flood control studies of selected components of the CVP since 1975 have given a strong indication that flood control benefits are substantially understated, even in the 1970 time frame.

In developing the 1970 separable and joint cost allocation factors and implementing them in allocating the plant-in-service costs of the Central Valley Project, we deviated from the original 1970 allocation in one important instance with the regard to the allocation of costs for the Friant Dam and Reservoir. In reviewing the documentation for the 1975 short-form allocation, we noted that Reclamation had performed a separate dual purpose SCRB for Friant Dam and Reservoir, which allocated the costs entirely among its two authorized purposes of water supply and flood control. In the original 1970 SCRB, Friant's costs were treated similar to other multipurpose project features resulting in a portion of the costs being allocated to the power project purpose for which there is no authorization. We concur with Reclamation's approach to allocating Friant Dam and Reservoir costs in the 1975 SCRB and have followed that methodology in recreating the 1970 SCRB factors⁸.

The impact of utilizing the 1970 SCRB factors (modified as noted above for Friant D&R) to allocate the CVP costs results in a shifting of \$45,930,000 from reimbursable project costs to non-reimbursable project costs, primarily back to the Flood Control project purpose (approximately \$40 million). In comparison to total in-basin plant-in-service costs of \$2.9 billion, this represents a 1.58% cost shift.

Please refer to Appendix One of this report for supporting documents, schedules and computations.

Environmental Re-operation of the Project: Since the last CVP cost allocation study (performed in 1975), the authorized purposes of the CVP have been greatly expanded and the project has undergone significant re-operation. The accomplishments of the project have been altered dramatically as a result of various legislative acts and policy decisions including the CVPIA, ESA and Bay/Delta accord. There is also the potential for CALFED to create additional impacts on CVP operations.

The current cost allocation methodology does not adequately reflect the significant new environmental benefits that have been generated by re-operation of the project and the associated enhancement and mitigation activities that have subsequently ensued. Nor does the current allocation reflect the significant diminishment of benefits seen by the water and power functions.

Section 3406(a) of the CVPIA amended the CVP's Authorizing Act of August 26, 1937 to establish the environment as a new project purpose. This new environmental project purpose was established for the purpose of mitigation, protection, restoration and enhancement of the environment. In many instances, the CVPIA specifies the sources of funds and the allocation of expenditures associated with particular tasks to be performed. However, in other instances, the CVPIA is silent. This poses significant problems with regard to reflecting the impacts these activities have on the project when performing the allocation of CVP costs.

The difficulties and ambiguities of the CVPIA are particularly contrasted with regard to CVP water supplies reallocated to the environment under Sections 3406(b)(2) and 3406(d). Section 3406(b)(2) dedicates 800,000 acre-feet of CVP yield toward fish and wildlife activities carried out under the CVPIA. Section 3406(d) is more specific in nature and dedicates additional CVP water toward meeting the water supply needs of wildlife refuges.

Section 3406(d) provides very specific instructions regarding the repayment responsibility for the differing levels of refuge water supply needs. As such, a reasonable basis exists for allocating costs to this activity through the CVP cost allocation process. Under the current cost allocation method, this is accomplished through the water supply suballocation. The suballocation incorporates the historical and projected deliveries to the wildlife refuges and categorizes them as being either Level 1, 2 or 4 deliveries (as determined by the Refuge Water Supply Report released by Reclamation in March 1989). In accordance with the CVPIA, costs allocated through the cost allocation process to Levels 1 and 4 are

⁸ This actually increased the allocation of Friant D&R costs to the reimbursable project purposes of irrigation and M&I by \$770,000 compared to the existing allocation.

considered environmental enhancement and are non-reimbursable to the contractors. Costs allocated to Level 2 through the cost allocation process are reimbursable by the water and power contractors.

In addition to incorporating Section 3406(d) deliveries to the refuges in the water supply suballocation, Reclamation further reflected the impacts of environmental re-operation on the project by reducing projected deliveries to export contractors by as much as 50% of contract entitlement in the current period. Projected deliveries gradually increase back to 100% of contract entitlement by 2026 under the premise that water reallocated to the environment will be replaced with newly developed supplies and/or conservation efforts.

It is important to note at this point that the CVPIA established the environment as a new project purpose with equal status to the previously existing project purposes. As such, consideration should be given to this new project purpose in developing the separable and joint cost allocation factors under the SCRB process. However, as noted earlier, it is not cost effective to perform a new SCRB at this time. We have concluded that the water supply suballocation provides a reasonable alternative for allocating CVP costs to the environment until such time as a new cost allocation study can be performed.

Recommendation

To further refine the water supply suballocation, we propose that the 800,000 AF of environmental water under Section 3406(b)(2) of the CVPIA is treated in a manner similar to the wildlife refuge water under Section 3406(d). While the inclusion of the b(2) water in the water supply suballocation will still not fully reflect the environmental re-operation of the project, it will result in a step in the right direction.

We are aware of the significant difficulties involved in incorporating the b(2) water in the water supply suballocation. Chief among these difficulties is the absence of guidance in the CVPIA regarding expected annual demands for the 800,000 acre-feet as well as guidance pertaining to the allocation of the associated costs between the reimbursable and non-reimbursable components. Clearly however, in spite of the inherent difficulties, an attempt to allocate CVP costs on some reasonable basis to reflect the impact of implementing Section 3406(b)(2) of the CVPIA must be made. The CVPIA specifies that two of its goals are to protect and enhance the environment. To ignore the role that the b(2) water will play in this process is a significant shortcoming of the current cost allocation.

The key to incorporating the b(2) water into the water supply suballocation lies in developing a water delivery schedule for the environment. While not a perfect solution, we believe that the assumptions presented herein can be used to develop an environmental water delivery schedule for the b(2) water and provide a reasonable and equitable basis for allocating CVP costs.

The following assumptions were used to develop an environmental water delivery schedule:

Assumptions for Environmental Water Delivery Schedule

1. Select a geographically representative sample of irrigation and M&I contractors from Schedule A-12 of the CVP Rate Books that together have contract entitlements adding up to 800,000 acre-feet. Reclamation's October 5, 1999 final decision for accounting for the 800,000 acre-feet could be used as a guide in selecting contractors by geographic region. For example, the Reclamation proposal refers to Upstream Actions (Shasta, Trinity, Folsom, New Melones) and Delta Actions. The report goes on to estimate that between 200,000 and 350,000 acre-feet would be needed for winter/fall upstream actions and the remainder to be available for spring/summer measures, both in the Delta and upstream. Based on this information, we would split the difference and pick contractors from North of the Delta amounting to 400,000 acre-feet and contractors from South of the Delta amounting to 400,000 acre-feet, and further divide the selection process to pick 15% M&I and 85% irrigation to

approximate actual usage between the two user groups. The resulting representative contractor delivery schedules would be combined and serve as an environmental water delivery schedule. Environmental deliveries would begin in 1993 and run through 2030.

2. Total water supply for purposes of the water supply suballocation would equal the sum of the historical and projected deliveries for M&I and irrigation for the period 1949-2030, plus the environmental water delivery schedules for CVPIA Sections 3406(d) [Wildlife Refuges] and 3406(b)(2) [Dedication of 800k AF]. The b(2) environmental deliveries would gradually increase in the same proportion that projected contractor deliveries increase in Schedule A-12 so that by 2026, the contractors would once again have their full entitlement and the environment would have full use of the 800,000 acre-feet. The rationale is as follows:
 - The CVPIA provides that M&I and irrigation will get replacement water for the 800,000 acre-feet allocated to the environment. Reclamation in establishing Schedule A-12 took into consideration the South Delta constraints by reducing projected deliveries to as low as 50% for exporters. These restrictions are gradually lifted under the assumption that makeup water will be found.
 - The CVPIA contains shortage provisions for b(2) water of up to 25% when irrigation deliveries are reduced because of hydrologic circumstances; therefore, it is reasonable to assume a buildup schedule similar to the one created for water contractor deliveries for environmental deliveries.
3. For the period 1993 through 2006, none of the 800,000 acre-feet of b(2) water would be considered as environmental enhancement water. Environmental enhancement would be assumed to begin in 2007. 37.5% of the b(2) deliveries would be classified as environmental mitigation deliveries reimbursable by the federal water and power contractors beginning in 1993. The rationale is as follows:
 - Calfed projects that Phase 1 of the Calfed environmental restoration/mitigation project will take 7 years to complete. During that time, the majority of the projects being conducted will be to restore/mitigate the environment. Assuming that Phase 1 begins in FY 2000, the environment should be significantly mitigated and environmental enhancement should occur by the 2007. Although not CVPIA specific, Calfed's projections provide a good indicator as to when we can expect environmental enhancement under the CVPIA to occur.
 - The CVPIA clearly states that a portion of the b(2) water is for enhancement and Reclamation has reinforced this statement in their Cost Allocation Public Workshops and in their October 5, 1999 final decision for accounting for the 800,000 acre-feet. The problem is that neither the CVPIA nor Reclamation's October 5th final decision provides guidance for determining the reimbursable portion of the activities covered under Section 3406 (b)(2). Although no specific guidance is provided, other sections of the CVPIA routinely established 37.5% as the federal reimbursable cost share percentage. This provides a reasonable indication as to what Congress considered to be environmental mitigation to be repaid by the federal water and power contractors. Therefore, it is reasonable to apply this same percentage to the 800,000 acre-feet of b(2) water.

The resulting water supply suballocation factors developed by applying the above environmental water delivery assumptions would result in a shifting of \$18,250,000 from reimbursable costs to non-reimbursable costs. In comparison to total in-basin plant-in-service costs of \$2.9 billion, this represents a 0.63% cost shift.

Please refer to **Appendix Two** of this report for supporting documents, schedules, and computations.

Summary of Impacts:

The table below summarizes the impacts on the allocation of CVP In-Basin Plant-In-Service costs for the proposed SCRB and Environmental Re-operation changes noted above. This table does not reflect the impacts of issues discussed in the "Other Cost Allocation/Repayment Issues" section that follows.

In total, \$64 million are reallocated from the reimbursable project purposes of M&I, irrigation, and commercial power to the non-reimbursable project purposes of navigation, flood control, and fish and wildlife. The reallocation of \$40 million to flood control essentially restores the level of allocated costs to their pre-1975 Short-form Allocation levels, which we believe provides a more fair and equitable representation of the value of flood control to the project. The majority of the increase in allocated costs to fish and wildlife is due to the inclusion of the 800,000 acre-feet of CVPIA Section 3406(b)(2) water in the water supply suballocation. We believe this results in a more fair and equitable representation of the increased value of the project to the fish and wildlife purpose as a result of project re-operation.

Central Valley Project Joint Water and Power Contractor Cost Allocation Proposal Summary of Changes in Allocated Plant-In-Service Costs						
	In Basin					
	USBR Existing Allocation		Contractor Proposed Allocation		Change in Allocation	
	Dollars	Percent	Dollars	Percent	Dollars	Percent
Plant-In-Service Cost per 9/30/98 Bureau Cost Allocation	2,853,528,211	98.421%	2,853,528,211	98.421%		
Capitalized CVPIA Programmatic Environmental Impact Study Costs	19,539,271	0.674%	19,539,271	0.674%		
Capitalized Deferred Interest	26,244,984	0.905%	26,244,984	0.905%		
Total Plant-In-Service Investment	2,899,312,466	100.000%	2,899,312,466	100.000%		
Non-Reimbursable Costs – Federal & State						
Direct Assigned Costs:						
Federal Tax Payer	67,964,007	2.344%	67,964,007	2.344%	0	0.000%
State Share of San Luis Joint Facilities	220,249,492	7.597%	220,249,492	7.597%	0	0.000%
Water Quality Improvement	5,613,449	0.194%	5,613,449	0.194%	0	0.000%
Navigation	5,783,326	0.199%	6,699,448	0.231%	916,122	0.032%
Flood Control	139,304,037	4.805%	179,298,264	6.184%	39,994,227	1.379%
Recreation	73,877,767	2.548%	73,877,767	2.548%	0	0.000%
Fish and Wildlife	159,740,402	5.510%	183,187,858	6.318%	23,447,456	0.809%
Other Allocated Costs	4,531,976	0.156%	4,354,570	0.150%	(177,406)	-0.006%
Subtotal Non-Reimbursable Costs	677,064,456	23.353%	741,244,855	25.566%	64,180,399	2.214%
Authorized Deferred Use:						
Tehama Colusa Canal	54,450,000	1.878%	54,450,000	1.878%	0	0.000%
Folsom South Canal	2,425,000	0.084%	2,425,000	0.084%	0	0.000%
Subtotal Authorized Deferred Use	56,875,000	1.962%	56,875,000	1.962%	0	0.000%
Reimbursable Plant-In-Service Costs (Water and Power)	2,165,373,010	74.686%	2,101,192,611	72.472%	(64,180,399)	-2.214%
M&I	231,502,279	7.985%	229,895,046	7.929%	(1,607,233)	-0.055%
Irrigation	1,385,131,071	47.774%	1,353,111,946	46.670%	(32,019,126)	-1.104%
Commercial Power	548,739,659	18.927%	518,185,622	17.873%	(30,554,037)	-1.054%
	2,165,373,010	74.686%	2,101,192,614	72.472%	(64,180,396)	-2.214%

Other Cost Allocation/Repayment Issues:

The Committee's May 19, 1999 comment letter on the Baseline Allocation contained several other issues that are primarily repayment issues not directly dependent on the nature of the cost allocation methodology. These issues require both financial and policy level analysis in order to reach a satisfactory resolution. We request Reclamation work with the Committee to establish a process for resolving the following outstanding issues.

- **Allocation of CVPIA Capital Expenditures** – In a memorandum from the Regional Director dated February 11, 1993, Reclamation documented their interpretation of the language “shall be reimbursed as main project features” relative to certain costs incurred as a result of CVPIA activities.

The memorandum states that:

“Our Regional policy is to allocate reimbursable fish and wildlife mitigation⁹ construction costs on the basis of the structure (main project feature) that necessitated the mitigative measures to be undertaken. In almost all cases, this procedure will allocate costs to both reimbursable and non-reimbursable functions. To the extent that there are reimbursable costs, they will be repaid, as appropriate, by direct beneficiaries of the Central Valley Project (CVP); i.e., CVP water and power users. The non-reimbursable costs will be “repaid” by the Federal Government.”

In 1995, an audit conducted by the Office of the Inspector General questioned Reclamation's Regional policy regarding the allocation of reimbursable CVPIA costs under Section 3406(b). As a result, Reclamation reevaluated and revised their policy so that these costs are now recovered 100 percent from the Project's water and power users. Because this appears to have been an arbitrary and onerous decision from our perspective, we request that Reclamation reexamine this issue and formally document their final interpretation, with the appropriate supporting documentation.

- **Sugar Pine Dam and Reservoir Capital Costs** – The Sugar Pine Dam and Reservoir and associated distribution system were authorized in 1965 under P.L. 89-161, which was passed primarily to authorize the Auburn-Folsom South Unit of the American River division of the Central Valley Project.

The language of P.L. 89-161 specifies that *“the operation of the Auburn-Folsom South Unit, American River division, shall be integrated and coordinated, from both a financial and operational standpoint, [emphasis added] with the operations of other features of the Central Valley project...”*

The 1965 Act's requirement that the facilities be integrated both financially and operationally is a significant point with regard to Sugar Pine Dam and Reservoir. Sugar Pine, whose reservoir capacity was reduced from 16,000 acre-feet to 7,000 acre-feet and annual yield reduced from 4,000 acre-feet to 2,800 acre-feet from that authorized under the 1965 Act, provides no water for the rest of the CVP, and its distribution system serves only one contractor. Although Sugar Pine was not integrated operationally, it was integrated financially into the project.

The issue of the financial integration of Sugar Pine in the absence of operational integration takes on additional significance when you consider that the facilities, originally estimated to cost \$17 million, ultimately cost over \$71 million to construct. Of this \$71 million, approximately \$57 million is allocated to M&I for repayment, comprising approximately 26% of M&I's total plant-in-service

⁹ Reclamation has exclusively used the term mitigation in this context. The CVPIA does not exclusively use this term in the context of Section 3406(b). In fact in Section 3406(b)(1), it explicitly states that “the programs and activities authorized by this section shall, when fully implemented, be deemed to meet the mitigation, protection, restoration, and enhancement [emphasis added] purposes established by subsection 3406(a) of this title”.

repayment responsibility for the In-Basin facilities. Approximately \$4.3 million of Sugar Pine costs are allocated to irrigation, with the remainder allocated to non-reimbursable project purposes.

Below are a few key points related to the decision to continue with the financial integration of Sugar Pine with the Central Valley Project:

- On January 6, 1978, Deputy Assistant Secretary of the Interior Dan Beard approved a proposal for an amendatory contract with Foresthill PUD that would allow the construction of Sugar Pine to proceed. In the memo, Beard made some important observations:

- Beard noted that the reduction in size of Sugar Pine was of such significance that *“The changes raise serious questions in my mind as to whether project features, costs and benefits have changed to such an extent as to require reauthorization by Congress”*. We have not found any evidence that the project was reauthorized, or any Solicitor’s opinion that it was not required.
- Beard stipulated that a *“Definite Plan report”* on the project be prepared *“including economic justification and financial analysis”*. Beard estimated that the contract with Foresthill PUD would repay only \$9.5 million of the then estimated \$17 million total construction costs, leaving a significant burden to be repaid by the other CVP contractors (primarily M&I). Beard was clearly concerned about this problem, adding *“I want some assurances that reimbursable costs will be repaid within the time required by reclamation law and that those who will be repaying the excess costs have knowledge of it. A Definite Plan report should be useful in this regard”*. [emphasis added]
- In the memo approved by Beard, Reclamation Commissioner Keith Higginson made several points:

He confirmed that *“Sugar Pine Dam and Reservoir are geographically separated from and independent of Auburn Dam and its water supply”*. This is confirmation that the project does not meet the operational integration requirement of P.L. 89-161.

He acknowledged that the \$85 an acre-foot rate to be charged Foresthill PUD was not sufficient to recover the construction costs with interest, but referred to a 1974 policy memo as the vehicle for recovering the costs¹⁰.

- In his response memo on February 28, 1978, Commissioner Higginson advised Secretary Beard that *“it has been determined that reauthorization is not necessary”*. Further, Higginson added that *“we feel that the preparation of a definite plan report would not serve any useful purpose”*. He also asserted that *“Financial feasibility is also assured because the Central Valley Project (CVP) is considered to be a single project of repayment purposes; that is, separate project parts such as FDU are not repaid separately but are combined with all other CVP units and all assist in repayment of all costs in a manner similar to private utility operations”*.

It is important to note that the February 28th memo from Commissioner Higginson makes no reference to Secretary Beard’s direction that the other CVP contractors be made aware of the additional repayment responsibility. We are not aware of any formal notification to that effect.

¹⁰ In 1974, Reclamation issued a memo establishing a standard M&I rate for CVP customers, such rate to be maintained at a level sufficient to pay off all M&I storage and conveyance costs within 50 years. Foresthill PUD’s new contract was negotiated under that policy, at a rate of \$85 an acre-foot.

Given the significance of the repayment responsibility to the CVP contractors (particularly M&I) and the lack of operational integration as originally intended by the authorizing act, we question whether it is reasonable and equitable to financially integrate the cost of Sugar Pine Dam and Reservoir into the Central Valley Project. We request Reclamation analyze whether it was reasonable and proper to financially integrate the Sugar Pine Dam and Reservoir facilities into the CVP in the absence of the operational integration specified by the Authorizing Act, and formally document their decision. Please see Appendix Three of this report for supporting documents.

- **Out of Basin Environmental and Recreational Enhancement** – The feasibility report for the San Felipe Division (reported in House Document No. 500) makes reference to environmental and recreational enhancements created as a result of Santa Clara Valley Water District's re-operation of its non-project reservoirs in conjunction with receiving San Felipe water supplies. The ratio of non-reimbursable to reimbursable costs estimated in the feasibility report was approximately ten percent non-reimbursable and ninety percent reimbursable. In an August 30, 1994 memo, the Bureau agreed to maintain that ratio in allocating San Felipe Division (Out-of-Basin) costs.

At issue is whether similar environmental and recreational enhancements were created in the In-Basin facilities through which San Felipe Division water must pass in order to reach its destination. To the extent enhancement costs can be identified, they become a non-reimbursable contractor expense. It is our understanding that Reclamation has agreed to deal with this issue as part of the current CVP cost reallocation study.

- **CVPIA and CALFED Capital Expenditures** – By law, existing CVP facilities must be repaid by 2030. However, a question arises regarding CVPIA capital expenditures already incurred or to be incurred in the future. By requiring significant CVPIA capital expenditures to be repaid by 2030 (particularly those incurred toward the end of the Project repayment period), Reclamation could create undue financial hardship on the part of the contractors.

In order to avoid the potential for financial hardship, we request Reclamation analyze the potential for establishing separate repayment periods for reimbursable CVPIA capital expenditures (and CALFED capital expenditures should any accrue to the CVP contractors). The decision to establish a separate repayment period should be based on the timing and magnitude of the expenditure. The degree to which Restoration Fund credits offset the expenditure should also be considered. We would be happy to assist Reclamation in this endeavor.

Appendix B

CENTRAL VALLEY PROJECT PLANT-IN-SERVICE ALLOCATION AS OF SEPTEMBER 30, 1999 PROPORTIONAL ALTERNATIVE EXCLUDED, EXEMPT, JOINT, AND SPECIFIC COSTS

EXCLUDED COSTS	
Feature	Plant in Service
Buildings	\$3,055,682.37
Depreciation - Buildings	(2,107,548.99)
Folsom-So. Canal Deferred Use	2,425,000.00
Folsom Safety of Dams	20,955,542.24
New Melones Archeology	4,120,000.00
New Melones Hwy. Improvement	13,280,000.00
New Melones Non-reimbur. IDC	27,012,917.50
Coming Canal Archeology	10,805.00
T-C Canal Deferred Use	54,460,000.00
T-C Canal Archeology	3,500.00
San Felipe Non-reimbur. IDC	199,109.00
Little Panoche Creek SOD	5,555.57
Los Banos Creek SOD	9,166.38
O'Neill Safety of Dams	4,596,909.65
BF Slak Highway Improvement	1,383,318.00
San Luis Unit - State	224,110,564.22
San Luis Drain Archeology	6,851.00
Abandoned/Retired Plant	(127,868.48)
Depreciation - Structures	(2,005,075,668.91)
Capitalized Movable Equipment	3,854,700.18
Depreciation - Equipment	(1,984,141.44)
Abandoned/Retired Plant	127,868.48
Loss on Property Transfers	29,892.32
Accumulated Depreciation	2,009,187,356.34
Total	\$359,509,513.43

EXEMPT COSTS	
New Melones	\$365,112,787.98
Black Butte	14,508,819.47
COE Repayment Assumed	14534810.48
M&I Repayment Contracts	6,357,248.97
Irrigation Repayment Contracts	314,392,052.30
Los Banos Creek Dam - Federal	3,725,041.25
Western Interties	49,349,548.00
San Felipe Division	351,327,020.03
Spring Creek Debris Dam	3,710,490.00
Total	\$1,123,017,796.48

JOINT COSTS	
Multi-purpose features allocated using joint cost factors from 1975 Reallocation study	
Feature	Plant in Service
Highway 49 Repairs	\$1,994,659.74
Sugar Pine Dam & Reservoir	43,537,391.01
Folsom Dam & Reservoir	62,146,902.53
Folsom SOD (Reimbursable)	3,698,036.87
Folsom Perm. Oper. Facilities	627,593.61
Nimbus Dam	7,001,863.75
Sly Park Perm. Oper. Fac.	112,149.00
Tracy Perm. Oper. Facilities	1,143,686.12
Solsun Marsh Preservation	28,666,493.00
Friant Perm. Oper. Facilities	305,649.00
Centralized W/P, Radio, Telem.	19,088,607.61
Elverta Perm Oper. Facilities	8,444.92
Shasta Perm. Oper. Facilities	403,371.67
Shasta Dam & Reservoir	123,837,622.62
Shasta Rain Gauges	643,301.56
Shasta Stream Gauges	11,145.00
Whiskeytown Dam	17,741,504.97
Clear Creek Tunnel	49,951,750.37
Spring Creek Tunnel	15,155,827.39
Trinity Dam & Reservoir	92,794,900.05
Trinity Perm. Oper. Facilities	355,281.28
Trinity Radio Network	54,642.00
Subtotal	\$489,282,624.05

Multi-purpose features allocated using separable cost factors from 1975 Reallocation Study	
Feature	Plant in Service
Folsom South Perm. Oper. Fac.	\$10,141.69
Friant Dam & Reservoir	28,857,576.82
Tehama-Colusa Canal	81,256,390.27
T-C Canal Fish Facilities	43,327,846.53
Subtotal	\$153,451,955.31
Total	\$622,714,779.36
(Initial Joint Cost Pool)	

ALLOCATION BASE	
1999 Allocation Base	\$3,290,188,020.93
Excluded Costs	(359,509,513.43)
Exempt Costs	(\$1,123,017,796.48)
Proportional Alternative Allocation Base	\$1,807,658,711.02
INITIAL JOINT AND SPECIFIC	
Initial Joint Costs	622,714,779.36
Initial Specific Costs	1,184,943,931.66
Proportional Alternative Allocation Base	\$1,807,658,711.02
REVISED JOINT AND SPECIFIC	
<i>(With specific cost for flood control) 1/</i>	
Joint Costs	596,738,649.47
Specific Costs	1,208,920,061.55
Proportional Alternative Allocation Base	\$1,807,658,711.02

1/ Specific flood control cost

Feature	Percent flood control space	Plant in Service	Specific flood control
Folsom Dam	18.795%	\$62,146,902.53	\$11,680,510.33
Friant Dam	6.462%	28,857,576.82	1,864,776.61
Shasta Dam	8.423%	123,837,622.62	10,430,842.95
			\$23,976,129.89

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COMMUNICATION
 DEPARTMENT OF THE ARMY
 SACRAMENTO DISTRICT, CORPS OF ENGINEERS
 650 CAPITOL MALL
 SACRAMENTO, CALIFORNIA 95814

820

REPLY TO
 ATTENTION OF
 SPKED-W

Appendix C

27 February 1975

COE Letter of
 February 27, 1975

Mr. B. E. Martin, Regional Director
 Mid-Pacific Regional Office
 U. S. Bureau of Reclamation
 2800 Cottage Way
 Sacramento, CA 95825

SEARCHED	INDEXED
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MAR 3 1975	
SACRAMENTO	
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Dear Mr. Martin:

Please refer to your letters of 30 August 1974 and 13 February 1975 (your reference MP-740 820) concerning the matter of current flood control benefits for Friant, Shasta, Folsom, and Auburn Dams. Upon receipt of your 30 August letter we initiated pertinent hydrologic studies of the Sacramento, American, and San Joaquin Rivers, since it appeared that the flood events since 1959 could be expected to modify the supporting hydrology for our 1959 studies. The 1959 studies, through an updating process, were the basis for the flood control benefit estimates provided you in our letter of 25 April 1969. Completion of the hydrologic studies in mid-December 1974 confirmed our opinion as to the likelihood of such modification. It appears that the effect of the new hydrology would be to increase the indicated average annual benefits. Price level increases and increased economic development would also increase previously computed benefits.

In recent months the guideline framework for Corps flood control benefit studies has undergone extensive change with concurrent substantive increases in the complexity of such studies and in the time and effort necessary to conduct them. While we are uncertain as to the magnitude of the effect of these guideline changes on flood control benefit computations for the four dams, it appears that they will act to appreciably decrease the benefits. These considerations of probable adverse effect of the new guidelines and probable favorable effect of new hydrology, viewed in the light of general price increases and economic growth during the past five years in areas protected by the four dams, cause us to conclude that current flood control benefits would at least equal those

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Mr. B. E. Martin, Regional Director

27 February 1975


supplied you in April 1969, but might not significantly exceed them. Inasmuch as it does not appear appropriate to merely update the 1969 benefits, which, as previously indicated, were derived through updating of 1959 values, we recommend that you use the 1969 data to meet your present needs.

With regard to your future needs and in view of the desirability of your having project flood control benefits based on new hydrology and derived in conformity with our new guidelines, we further recommend that detailed study of such benefits be undertaken. Our present workload and established priorities for work output preclude our involvement in such study prior to July 1975. While some funding for this work could come from our own resources, we estimate a requirement for additional funds in the order of \$15,000, with completion of the work by the end of March 1976.

With regard to current navigation benefits creditable to Shasta Dam, we are of the opinion that an increase over the 1959 estimate, as reiterated in our letter of 25 April 1969, is appropriate. In the absence of detailed analysis, we consider an estimate of \$1,500,000 for such benefits to be reasonable.

Please let us know if you wish us to undertake the detailed reevaluation of the benefits, and if you can furnish the necessary funds.

Sincerely yours,


F. G. ROCKWELL, SR.
Colonel, CE
District Engineer

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