Benefit Calculation, Monetization, and Resiliency Tab

A10: Cost Allocation

Temperance Flat Reservoir Project
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Abbreviations and Acronyms

CWC  California Water Commission
CVP  Central Valley Project
CVPIA  Central Valley Project Improvement Act
Delta  Sacramento-San Joaquin River Delta
IDC  interest during construction
M&I  municipal and industrial
OM&R  operations, maintenance, and replacement
PEC  Program Economics, Revenues, and Contracts
Proposition 1  Water Quality, Supply, and Infrastructure Improvement Act of 2014
Reclamation  U.S. Department of the Interior, Bureau of Reclamation
SCRB  separable costs-remaining benefits
SJRRP  San Joaquin River Restoration Program
TAF  thousand acre-feet
TFR  Temperance Flat Reservoir
WSIP  Water Storage Investment Program
CHAPTER 1
METHOD OF COST ALLOCATION

This document summarizes and references the cost allocation for the Temperance Flat Reservoir (TFR) Project in support of an application to the California Water Commission (CWC) under the Water Storage Investment Program (WSIP).

The WSIP Technical Reference Section 3.5 provides requirements for a proposed water storage project cost allocation. A benefits-based cost allocation must be performed to determine the costs to be assigned to the project beneficiaries. The cost allocation must be sufficient to demonstrate that the project and the request for funding of public benefits comply with Water Code Sections 79756 and 79757. The federal government’s Separable Costs-Remaining Benefits method is a commonly acceptable method to do a cost allocation.

Section 8 of the Technical Reference provides additional detailed guidance for cost allocation. Costs must be allocated to beneficiaries in a manner that demonstrates financial and economic feasibility and that supports the WSIP funds requested. The proposed cost share for each benefit category must be justified by and consistent with its level of quantified benefit. The cost allocated to any public benefit must not exceed the dollar amount of that public benefit. Costs for the five public benefit categories may be allocated to the State of California, the United States, local governments, or private interests.

This chapter includes a description of cost allocation terminology and methods. Types of costs to be allocated are generally described, as well as existing authorities used to assign costs to beneficiaries.

1.1 Process Overview and Terms

Allocation of water resources project costs is made to derive an equitable distribution of costs among the project beneficiaries and project purposes, in accordance with existing law. This analysis provides an initial indication of the cost implications of constructing the TFR Project for the project beneficiaries and purposes. It does not represent a detailed assessment of the economic effects of costs being borne by different entities (local, State, and Federal).

The basic steps associated with cost allocation and assignment are as follows:

- Identify costs to be allocated
- Allocate costs to project purposes
- Assign costs to beneficiaries
1.1.1 Costs Allocated
Total project costs allocated include capital costs, interest during construction (IDC), post-construction environmental mitigation and compliance obligations, and annual operations, maintenance, and replacement (OM&R) costs. These costs are described in more detail in the Eligibility and General Project Information, Attachment 4 (A4): Engineering Summary Attachment, Chapter 6.

- **Capital costs** – Capital costs include the field costs, non-contract costs, initial environmental mitigation and compliance costs, land acquisition costs, and other costs to construct all elements of the project necessary to achieve the anticipated benefits.

- **Interest during construction** – IDC accounts for the financial cost of project expenditures during the period between when construction begins and benefits are derived. IDC was calculated based on a 9-year construction period.

- **Annual operations, maintenance, and replacement costs** – OM&R costs are the costs required to assure continued benefits over the life of the project. For the purposes of this tentative cost allocation, post-construction environmental mitigation and compliance obligations are included in OM&R costs.

It should be noted that cost allocation is a financial exercise rather than an economic evaluation. Consequently, project costs may be presented differently in a cost allocation than in an economic analysis.

1.1.2 Allocating Costs to Project Purposes
Once all project costs have been identified, they are allocated to the project purposes. Assumptions have been made regarding the potentially authorized project purposes for the purpose of this report. Specific costs are for project components that contribute to a single purpose. Separable costs are the costs of the portion of multi-purpose facilities due to the inclusion of the purpose in question (e.g., higher dam embankment due to flood control purpose). Separable costs include specific costs and may include a portion of joint costs. They are estimated as the reduction in financial costs that would result if a purpose were excluded from an alternative. Remaining joint costs are the costs remaining after specific and separable costs have been removed.

Methods for allocating joint costs generally fall into one of two categories: those that consider benefits, and those that do not. Methods that do not consider benefits may divide joint costs between beneficiaries equally, or based on their share of separable costs. Methods that are based on benefits divide joint costs among beneficiaries proportional to the benefits each receives. The separable costs-remaining benefits (SCRB) method allocates costs among beneficiaries proportional to the benefits remaining after separable costs are removed. Benefits are derived in the economic analysis (see BCMR A3 Monetized Benefits Analysis and BCMR A5 Economic Valuation Approach).

1.1.3 Assigning Costs to Beneficiaries
The cost allocation process is designed so that costs associated with project purposes are assigned for cost sharing and/or repayment. Once costs are allocated to the appropriate purpose, costs can be assigned to project beneficiaries and Federal and/or State taxpayers.
based on specific project authorization, existing Federal law, existing cost sharing requirements, and laws and objectives of non-Federal entities, including states, counties, and non-profit organizations. Existing State of California and Federal authorities for financial participation for benefits for the TFR Project are discussed below.

State Authority
In November 2014, California voters passed the funding for the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1), a $7.5 billion water bond that will make needed investments in California’s water management systems.

Proposition 1 dedicates $2.7 billion for investments in water storage projects and designated the CWC as the agency responsible for appropriately allocating these funds. The CWC, through the Water Storage Investment Program, will fund the public benefits of eligible projects (allocated capital costs only). Eligible projects must also provide measurable benefits to the Sacramento-San Joaquin River Delta (Delta) ecosystem or its tributaries.

Projects that may be funded by the State under Proposition 1 will be selected by the CWC through a competitive public process based on a project’s expected return on the public investment as measured by the magnitude of the public benefits provided (CWC 2014). The public benefits categories defined by Proposition 1 include:

(1) Ecosystem improvements, including changing the timing of water diversions, improvement in flow conditions, temperature, or other benefits that contribute to restoration of aquatic ecosystems and native fish and wildlife, including those ecosystems and fish and wildlife in the Delta.

(2) Water quality improvements in the Delta, or in other river systems, that provide significant public trust resources, or that clean up and restore groundwater resources.

(3) Flood control benefits, including, but not limited to, increases in flood reservation space in existing reservoirs by exchange for existing or increased water storage capacity in response to the effects of changing hydrology and decreasing snow pack on California’s water and flood management system.

(4) Emergency response, including, but not limited to, securing emergency water supplies and flows for dilution and salinity repulsion following a natural disaster or act of terrorism.

(5) Recreational purposes, including, but not limited to, those recreational pursuits generally associated with the outdoors.

Article 4 of Chapter 8 of Proposition 1 identifies limitations regarding funding of public benefits. Proposition 1 limits funding in relation to quantified public benefits as follows:

(a) Ecosystem improvement benefits must be at least 50 percent of total public benefits requested for funding. If non-ecosystem public benefits are more than ecosystem public benefits, then the difference is not eligible for funding.
(b) The public benefit cost share of a project, other than conjunctive use and reservoir reoperation projects, may not exceed 50 percent of the total capital costs of the project.

(c) The entire package of public benefits provided by the project must be provided in a cost-effective manner.

Other project costs may also be assigned to the State that would not be eligible for Proposition 1 funding. For example, capital costs allocated to recreation can be assigned to the State under WSIP up to 50 percent of the total capital costs. Fifty percent of remaining recreation costs, such as IDC, and 50 percent of OM&R costs would be assigned to Federal, per Public Law 89-72, as amended, and 50 percent assigned to the State (i.e., California Department of Parks and Recreation management of recreation facilities).

**Federal Authority**

Repayment for Federal water resources projects is based on the principle that beneficiaries pay for benefits received. The general principle for repayment of the Federal investment to construct a water resources project is established by the Reclamation Project Act of 1939, Section 7(b):

> For any project, division of a project, development unit of a project, or supplemental works on a project, now under construction or for which appropriations have been made, and in connection with which the repayment contract has not been executed, allocations of costs may be made in accordance with the provisions of section 9 of the Act and a repayment contract may be negotiated, …

Existing legislation that describes Federal financial participation for purposes that could be used for allocating costs for the TFR Project is summarized in Table 1-1. Reimbursable costs are those that, through some form of up-front cost sharing, repayment, or other financial agreement, are repaid to the government. Non-reimbursable costs are those borne entirely by the government. Existing Federal law indicates that costs allocated to irrigation water supply, M&I water supply, emergency response, and hydropower purposes are considered reimbursable by project beneficiaries.

Public Law 89-72 states:

> …it is the policy of Congress and the intent of this Act that in investigating and planning any Federal navigation, flood control, reclamation, hydroelectric, or multipurpose water resource project that consideration shall be given to the opportunities, if any, which the project affords for outdoor recreation and for fish and wildlife enhancement…

As a result, recreation and fish and wildlife enhancement facilities have been constructed as part of most U.S. Department of the Interior, Bureau of Reclamation (Reclamation) projects since 1965. Fish and wildlife enhancement is nonreimbursable under Federal law; however, the Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended, provides a Federal non-reimbursable share of 75 percent and non-Federal share of 25 percent for fish and wildlife enhancements and up to 50 percent Federal financing for recreation investment costs.
Table 1-1. Existing Authorities for Federal Financial Participation for Monetized Benefit Categories and Potential Purposes of the TFR Project

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Pertinent Federal Legislation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation Water Supply</td>
<td>Reclamation Act of 1902, as amended</td>
<td>Reimbursable. This act provides for up-front Federal financing of irrigation water supply purposes, with 100% repayment of construction costs, without interest, and O&amp;M costs by beneficiaries.</td>
</tr>
<tr>
<td>Fish and Wildlife</td>
<td>Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended</td>
<td>Public Law 89-72, as amended, provides Federal nonreimbursable share of “exactly 75 percent of the development of fish and wildlife enhancement facilities” and “up to 50 percent of the OM&amp;R expenses for fish and wildlife enhancement facilities” (Reclamation LND D&amp;S 01-01). Per Reclamation policy, all joint OM&amp;R costs allocated to fish and wildlife are non-reimbursable (Reclamation PEC P07).</td>
</tr>
<tr>
<td>M&amp;I Water Supply (Including Emergency Response)</td>
<td>Reclamation Act of 1939, as amended</td>
<td>Reimbursable. This act provides for up-front Federal financing of M&amp;I water supply purposes, with 100% repayment of capital costs (including IDC and interest over the repayment period); 100% of O&amp;M costs are non-Federal.</td>
</tr>
<tr>
<td>Recreation¹</td>
<td>Federal Water Project Recreation Act of 1965 (Public Law 89-72), as amended by the Reclamation Recreation Management Act (Public Law 102-575)</td>
<td>Public Law 89-72, as amended, provides Federal nonreimbursable share of “up to 50 percent of the cost of development of recreation facilities” and “up to 50 percent of the OM&amp;R expenses for recreation” (Reclamation LND D&amp;S 01-01).</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>Reclamation Project Act of 1939, Section 9(c)</td>
<td>Nonreimbursable.</td>
</tr>
<tr>
<td>Hydropower²</td>
<td>Reclamation Act of 1906, as amended</td>
<td>Reimbursable. Similar to M&amp;I water supply.</td>
</tr>
</tbody>
</table>

Note:  
¹ No joint costs of Investigation Alternative Plans are allocated to the recreation purpose.  
² Hydropower is not currently an authorized purpose of the Friant Division and no Investigation costs are allocated to this purpose.

Key:  
D&S = Directives and Standards  
IDC = interest during construction  
M&I = municipal and industrial  
NED = National Economic Development  
O&M = operations and maintenance  
OM&R = operations, maintenance, and replacement  
Reclamation = U.S. Bureau of Reclamation  
TFR = Temperance Flat Reservoir

### 1.2 Potential Cost Allocation Methods

The method of cost allocation used must be consistent with the authorized purposes of the proposed project. For the TFR Project, potential project purposes for which costs are assumed to be allocated include: water supply (agricultural, M&I, and wildlife refuge), ecosystem improvement, emergency response, recreation, flood damage reduction, and hydropower. The preferred method to allocate joint costs to project purposes is the SCRB method. This requires calculation of the cost of alternative projects with each of the project purposes removed. Specific cost allocation considerations for water supply, fish habitat enhancement, emergency response, and recreation are described below.
Chapter 1  
Method of Cost Allocation

In this tentative cost allocation, costs allocated to water supply are aggregated for all agricultural, M&I, and wildlife refuges water supply beneficiaries. These allocated costs are then assigned to agricultural and M&I water supply and wildlife refuge purposes.

Ecosystem improvements are related to enhancing water temperature and flow conditions for salmon and other native fish in the San Joaquin River downstream from Friant Dam. Central Valley Project Improvement Act (CVPIA) Section 3406(b)(1) required the Secretary to develop an Anadromous Fish Restoration Program that makes reasonable efforts to ensure that natural productions of anadromous fish in Central Valley rivers and streams will be sustainable on a long-term basis. CVPIA Section 3406(c)(1) required the Secretary to develop a comprehensive plan to address fish, wildlife, and habitat concerns on the San Joaquin River to reestablish where necessary and to sustain naturally reproducing anadromous fisheries from Friant Dam to its confluence with the San Francisco Bay/Sacramento-San Joaquin Delta. The San Joaquin River Restoration Program (SJRRP) is currently being implemented under the authority granted by Section 3406(c)(1). Continued implementation of CVPIA actions and programs, including the Anadromous Fish Restoration Program and the SJRRP, constitute the mitigation, restoration, and enhancement requirements of the CVPIA (Sections 3406(b)(1) and 3406(c)(1)).

In comparison to without project conditions, the TFR Project would increase the ability to make cold-water releases, and enhance water temperature and flow conditions for salmon and other native fish in the San Joaquin River downstream from Friant Dam. These flow and temperature improvements would result in increased survival of anadromous fish, including Chinook salmon. Accordingly, consistent with the Principles and Guidelines and Reclamation policy, these increases in anadromous fish survival are considered enhancements because they are above and beyond implementation of CVPIA actions and programs. Authorization for ecosystem improvements is provided by Public Law 89-72, which specifies financial and OM&R participation by a non-Federal sponsor.

Emergency response is valued as a response to potential residential water shortages caused by natural disasters (i.e., seismic or flood event) that would affect the Delta. The incidental water available in a potential Temperance Flat Reservoir could be used to supply cities and communities following a natural disaster or act of terrorism.

Normally, for projects within the Central Valley Project (CVP), recreation would be accomplished under Public Law 89-72 with financial and OM&R participation by a non-Federal sponsor. Recreation is not an authorized purpose of the Friant Division of the CVP. Only costs specific to recreational benefits, therefore, are allocated to the recreation project purpose. Joint costs are not allocated to the recreation project purpose and single purpose alternative costs for this purpose are not calculated or used in the cost allocation.

Replacement power facilities included in the TRF Project would be non-federal and are intended to compensate PG&E for inundation of the Kerckhoff Project powerhouses, which is a cost incurred to achieve the two primary planning objectives. Because of this, costs for replacement power facilities are not allocated to a hydropower project purpose. Hydropower is not currently an authorized purpose in the Friant Division. Hydropower generation at Friant Dam has been developed by local and regional entities. While additional incidental hydropower benefits would be realized by the local power authorities, for the purposes of this tentative cost allocation these benefits and allocated costs are included in the agricultural and M&I water supply allocation.
CHAPTER 2
TENTATIVE COST ALLOCATION

The tentative SCRB analysis shown below was performed based on information developed as part of the planning phase. Consistent with guidance in Reclamation Manual Program Economics, Revenues, and Contracts (PEC) 01-02 “Cost Allocation,” when construction of the project is determined to be substantially complete, a final cost allocation will be performed.

2.1.1 Single-Purpose Alternative Costs

Single-purpose alternative cost is the cost of the most probable alternative providing the same level of single-purpose benefit as the multi-purpose project. The single-purpose alternative cost is used to determine the justified investment for each project purpose (minimum of project purpose benefit and single-purpose alternative cost). Single-purpose alternatives are described as follows, and estimates of costs are shown in Table 2-1.

- **Water Supply Reliability** – This single-purpose alternative would consist of purchasing water from the transfer/spot market. These costs were estimated through application of the unit values of water provided by the WSIP Technical Reference Document and would equal the water supply benefits (see BCMR A3 Monetized Benefits Analysis Chapters 2 and 3, and BCMR A5 Economic Valuation Approach, Chapters 3, 4, and 6). These costs do not include anticipated costs associated with land fallowing or retirement and OM&R costs. The cost allocation would not be sensitive to these additional costs as the benefit would continue to determine the justifiable expenditure in the SCRB analysis.

- **Ecosystem Improvements** – This single-purpose alternative would consist of constructing approximately 6,300 acres of flood plain habitat along the San Joaquin River (see BCMR A3 Monetized Benefits Analysis Section 3.1.1 and BCMR A5 Economic Valuation Approach Chapter 5). This would provide opportunities for habitat enhancement consistent with the TFR Project.

- **Emergency Response** – This single-purpose alternative would consist of an increase in storage capacity upstream from Friant Dam of 247 thousand acre-feet (TAF). This would be sufficient to provide emergency water supplies in the potential event of Delta levee breaches caused by natural disasters (e.g., seismic or flood events) or other catastrophic events with varying durations of pumping outages and consequent South-of-Delta deficits. The alternative would include the proposed Temperance Flat Powerhouse to compensate lost Kerckhoff Hydroelectric Project (Kerckhoff Project) value due to inundation with the new reservoir. The alternative would also include replacement utility and recreation features for affected infrastructure, but would not include the proposed boat ramps on the new reservoir.

- **Recreation** – As discussed, only separable costs are allocated to the recreation project purpose. Joint costs are not allocated to the recreation project purpose; therefore, single purpose alternative costs for this purpose are not calculated or used in the cost allocation.
• **Flood Damage Reduction** – This single-purpose alternative would consist of an increase in storage capacity upstream from Friant Dam of 106 TAF. This would be sufficient to provide an equivalent level of flood damage reduction. Hydropower, utility, and recreation features would be similar to those described under the emergency response single-purpose alternative.

All new storage facilities for single-purpose alternative costs were evaluated at Temperance Flat River Mile 274. New storage reservoirs at other locations in the upper San Joaquin River Basin would require larger, more costly facilities and would have substantial impacts on private property, other hydropower facilities, and environmental resources. For several purposes it was anticipated that, because each benefit value was low, the single-purpose alternative cost would not be the limiting factor, and that the cost allocation analysis would not be sensitive to new storage facility locations.

OM&R costs specific to physical features would not vary substantially between dam sizes because labor needs for dam operations and maintenance are assumed to be similar no matter the size of reservoir. OM&R costs would vary with dam size and would be higher for some of the smaller proposed reservoirs due to a decreased ability for the smaller reservoirs to compensate the value of the Kerckhoff Hydroelectric Project. These costs were not evaluated for smaller reservoir sizes because single-purpose alternative costs involving storage would not be the limiting factor and the cost allocation analysis would not be sensitive to higher OM&R costs associated with Kerckhoff Hydroelectric Project compensation.

Table 2-1. Summary of Estimated Costs of Single-Purpose Alternatives

<table>
<thead>
<tr>
<th>Item</th>
<th>Water Supply Reliability</th>
<th>Ecosystem Improvement</th>
<th>Emergency Response</th>
<th>Flood Damage Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Market Value</td>
<td>N/A</td>
<td>N/A</td>
<td>Increase Storage</td>
<td>Increase Storage</td>
</tr>
<tr>
<td>Net Capacity (TAF)</td>
<td>N/A</td>
<td>N/A</td>
<td>247</td>
<td>106</td>
</tr>
<tr>
<td>Present Value Costs 1,2,3</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>2,420.2</td>
<td>2,289.3</td>
</tr>
<tr>
<td>Capital Costs</td>
<td>0</td>
<td>61.7</td>
<td>276.8</td>
<td>227.9</td>
</tr>
<tr>
<td>IDC2</td>
<td>0</td>
<td>77.4</td>
<td>159.8</td>
<td>159.8</td>
</tr>
<tr>
<td>OM&amp;R3</td>
<td>0</td>
<td>77.4</td>
<td>159.8</td>
<td>159.8</td>
</tr>
</tbody>
</table>

Notes:
1. July 2015 price level
2. All numbers are rounded for display purposes, and therefore line items may not sum to totals.
3. 100-year period of analysis.
4. IDC calculations assume full financing of project capital costs. Up-front WSIP funding for capital costs would reduce IDC.
5. Water supply reliability costs do not include anticipated costs associated with land fallowing or retirement and OM&R costs. The cost allocation would not be sensitive to these additional costs as the benefit would continue to determine the justifiable expenditure in the SCRB analysis.

Key:
IDC = interest during construction
N/A = not applicable
OM&R = operation, maintenance, and replacement
TAF = thousand acre-feet
2.1.2 Separable Costs
Separable costs of each project purpose are the difference between the cost of the multipurpose project and the cost of a project with the purpose omitted. The separable costs shown in Table 2-2 were subtracted from the specific project purpose benefit to determine the remaining benefit in the SCRB cost allocation process. Following is a summary of each separable cost with the project purpose omitted.

- **Without Water Supply Reliability** – Without water supply reliability, a new reservoir would need to be large enough to provide all other benefits. Building a single purpose project (floodplain habitat) for ecosystem improvement and a large reservoir for emergency response, flood management space, and recreation would maintain the same level of benefits for all categories except water supply. The costs of these projects would exceed the cost of the TFR Project, so the TFR project would be the least cost action. Only CVP pumping costs would be omitted as it is a specific cost that serves only irrigation water supply reliability.

- **Without Ecosystem Improvement** – Ecosystem improvement benefits result from new storage capacity and associated water supply operations and carryover targets. Even without ecosystem improvement benefits the same alternative features and storage capacity would be needed to provide water supply reliability and other benefits. Therefore, there would be no separable costs for the ecosystem improvement purpose.

- **Without Emergency Response** – Similar to ecosystem improvement benefits, without emergency water supply, the proposed alternative features would still be needed to provide all other benefits and there would be no separable costs for the emergency water supply purpose.

- **Without Recreation** – Without recreation the proposed alternative features, except for boat ramps on the proposed reservoir, would still be needed to provide all other benefits. The construction and OM&R costs of the proposed boat ramps would be omitted.

- **Without Flood Damage Reduction** – Similar to ecosystem improvement benefits, without flood damage reduction benefits the proposed alternative would still be needed to provide all other benefits and there would be no separable costs for the flood damage reduction purpose.

<table>
<thead>
<tr>
<th>Table 2-2. Summary of Estimated Separable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Present Value Cost $^{1,2}$ ($ millions)</td>
</tr>
<tr>
<td>Capital Costs</td>
</tr>
<tr>
<td>IDC$^4$</td>
</tr>
<tr>
<td>OM&amp;R</td>
</tr>
</tbody>
</table>

$^1$ Present Value Cost is determined by a 3% discount rate. $^2$ Capital Costs include CVP operational costs. $^3$ Recreation includes boat ramps. $^4$ IDC includes CVP operational costs.
2.1.3 Joint Costs
The joint cost is the cost of facilities that serve two or more project purposes. This cost is the difference between the cost of the multipurpose project and the sum of the separable costs. The joint cost is allocated to each purpose (except recreation) based on remaining benefits, which are the lesser of benefits or single-purpose alternative costs minus the total separable cost.

2.1.4 Allocated Costs
The SCRB method allocates costs among beneficiaries proportional to the benefits remaining after separable costs are removed. Table 2-3 shows an estimate of the allocation of costs for the TFR Project. As shown, the allocation of capital costs is divided among the study objectives for which costs are allocated, for a total of about $2,660.7 million. Determination of the cost allocation is an essential part of the multipurpose planning process where cost-sharing is required. It provides information needed to determine the magnitude and share of estimated project costs that are reimbursable. Cost allocation information is essential to the tests of financial feasibility and plan acceptability. During subsequent planning and construction, it provides the information required for allocating actual expenditures consistent with the plan formulation and allocation principles.

Table 2-3 displays a step-by-step process for determining the capital cost to be allocated to each project purpose. Table 2-4 displays the allocation of present value total project costs. As shown in these tables, cost shares for all benefit categories are less than benefits for each category, and specific costs would not exceed allocated costs or benefits.
# Table 2-3. Tentative Capital Cost Allocation for the Temperance Flat Reservoir Project

<table>
<thead>
<tr>
<th>Item/Calculation</th>
<th>Water Supply Reliability</th>
<th>Ecosystem Improvement</th>
<th>Emergency Response</th>
<th>Recreation</th>
<th>Flood Damage Reduction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>Allocated Capital Costs ($ millions) (^1,2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Present Value Benefits</td>
<td>2,528.5</td>
<td>2,439.1</td>
<td>217.4</td>
<td>203.1</td>
<td>115.3</td>
<td>5,470.8</td>
</tr>
<tr>
<td>2 Present Value Single Purpose Alternative Costs</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>2,420.2</td>
<td></td>
<td></td>
<td>2,289.3</td>
</tr>
<tr>
<td>3 Justifiable Expenditure (Lesser of Benefits/Single Purpose Alt Costs)</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>217.4</td>
<td></td>
<td></td>
<td>115.3</td>
</tr>
<tr>
<td>4 Present Value Separable Costs</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>57.1</td>
<td>0.0</td>
<td>57.1</td>
</tr>
<tr>
<td>5 Remaining Benefits/Justifiable Expenditure (3) - (4)</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>217.4</td>
<td></td>
<td></td>
<td>115.3</td>
</tr>
<tr>
<td>6 % Remaining Benefits (A5 to E5) + (F5)</td>
<td>63.0%</td>
<td>28.7%</td>
<td>5.4%</td>
<td></td>
<td></td>
<td>2.9%</td>
</tr>
<tr>
<td>7 Allocated Joint Capital Costs (A6 to E6) x (F7)</td>
<td>1,645.9</td>
<td>751.2</td>
<td>141.5</td>
<td>0.0</td>
<td>75.1</td>
<td>2,613.7</td>
</tr>
<tr>
<td>8 Separable Costs</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>47.0</td>
<td>0.0</td>
<td>47.0</td>
</tr>
<tr>
<td>9 Allocated Capital Costs (7) + (8)</td>
<td>1,645.9</td>
<td>751.2</td>
<td>141.5</td>
<td>47.0</td>
<td>75.1</td>
<td>2,660.7</td>
</tr>
</tbody>
</table>

Notes:
1. July 2015 price level
2. All numbers are rounded for display purposes, and therefore line items may not sum to totals.
3. Joint costs are not allocated to the recreation project purpose, therefore the distribution of joint costs is only based on remaining justifiable expenditure of other purposes.

Key:
- % = percent
- $ million = million dollars
- n/a = not applicable
### Table 2-4. Tentative Present Value Total Project Cost Allocation for the Temperance Flat Reservoir Project

<table>
<thead>
<tr>
<th>Item/Calculation</th>
<th>Water Supply Reliability</th>
<th>Ecosystem Improvement</th>
<th>Emergency Response</th>
<th>Recreation</th>
<th>Flood Damage Reduction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td><strong>Allocated Present Value Capital Costs ($ millions)</strong>&lt;sup&gt;12&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Present Value Benefits</td>
<td>2,528.5</td>
<td>2,439.1</td>
<td>217.4</td>
<td>203.1</td>
<td>115.3</td>
<td>5,503.4</td>
</tr>
<tr>
<td>2 Present Value Single Purpose Alternative Costs</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>2,420.2</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>3 Justifiable Expenditure (Lesser of Benefits/Single Purpose Alt Costs)</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>217.4</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>4 Present Value Separable Costs</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>57.1</td>
<td>0.0</td>
<td>57.1</td>
</tr>
<tr>
<td>5 Remaining Benefits/Justifiable Expenditure (3) - (4)</td>
<td>2,528.5</td>
<td>1,153.9</td>
<td>217.4</td>
<td>115.3</td>
<td>4,015.2</td>
<td></td>
</tr>
<tr>
<td>6 % Remaining Benefits (A5 to E5) + (F5)</td>
<td>63.0%</td>
<td>28.7%</td>
<td>5.4%</td>
<td>2.9%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>7 Allocated Present Value Joint Capital Costs (A6 to E6) x (F7)</td>
<td>1,972.1</td>
<td>900.0</td>
<td>169.6</td>
<td>89.9</td>
<td>3,131.7</td>
<td></td>
</tr>
<tr>
<td>8 Allocated Present Value Capital Costs (4) + (7)</td>
<td>1,972.1</td>
<td>900.0</td>
<td>169.6</td>
<td>89.9</td>
<td>3,188.7</td>
<td></td>
</tr>
<tr>
<td><strong>Allocated OM&amp;R and Future Monitoring/Adaptive Management Costs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Separable OM&amp;R Costs</td>
<td>2.3</td>
<td>0.0</td>
<td>0.0</td>
<td>6.9</td>
<td>0.0</td>
<td>9.1</td>
</tr>
<tr>
<td>10 Allocated to Joint OM&amp;R Costs (A6 to E6) x F10</td>
<td>101.3</td>
<td>46.2</td>
<td>0.0</td>
<td>4.6</td>
<td>160.9</td>
<td></td>
</tr>
<tr>
<td>11 Allocated OM&amp;R Costs (9) + (10)</td>
<td>103.6</td>
<td>46.2</td>
<td>8.7</td>
<td>6.9</td>
<td>4.6</td>
<td>170.0</td>
</tr>
<tr>
<td><strong>Allocated Present Value IDC Costs</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Separable IDC Costs</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>8.3</td>
<td>0.0</td>
<td>8.3</td>
</tr>
<tr>
<td>13 Allocated to Joint IDC Costs (A6 to E6) x F13</td>
<td>327.8</td>
<td>149.6</td>
<td>28.2</td>
<td>0.0</td>
<td>15.0</td>
<td>520.6</td>
</tr>
<tr>
<td>14 Allocated IDC Costs (13) + (14)</td>
<td>327.8</td>
<td>149.6</td>
<td>28.2</td>
<td>8.3</td>
<td>15.0</td>
<td>528.9</td>
</tr>
<tr>
<td><strong>Allocated Present Value Total Project Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Allocated Present Value Total Project Cost (8) + (11) + (14)</td>
<td>2403.5</td>
<td>1095.9</td>
<td>206.5</td>
<td>72.2</td>
<td>109.5</td>
<td>3887.7</td>
</tr>
</tbody>
</table>

**Notes:**
1. July 2015 price level
2. All numbers are rounded for display purposes, and therefore line items may not sum to totals.
3. Joint costs are not allocated to the recreation project purpose, therefore the distribution of joint costs is only based on remaining justifiable expenditure of other purposes.
4. IDC calculations assume full financing of project capital costs. Up-front WSIP funding for capital costs would reduce IDC.

**Key:**
- % = percent
- $ million = million dollars
- IDC = interest during construction
- n/a = not applicable
- OM&R = operation, maintenance, and replacement
CHAPTER 3  
TENTATIVE COST ASSIGNMENT

The cost allocation process is designed so that costs associated with project purposes are assigned for cost sharing and/or repayment. Once costs are allocated to the appropriate purpose, costs can be assigned to project beneficiaries and State and/or Federal taxpayers based on specific project authorization, existing Federal law, existing cost sharing requirements, and laws and objectives of State and local entities.

Table 3-1 shows assumed cost assignment percentages used in this analysis for purposes of repayment. The assignment percentage assumptions are based on existing State and Federal legislation described above and assumptions about potential implementation agreements.

Table 3-2 shows capital costs assigned to purposes of the TFR Project, consistent with existing State and Federal law. The assignment of costs includes costs to accomplish the purposes being considered for potential authorization, which are also consistent with the planning objectives. These costs amount to $2660.7 million per year. Also shown in Table 3-2, of the capital costs allocated for the TFR Project, 40.2 percent are estimated to be State WSIP public benefits and are the estimated WSIP cost share. Of the $1,068.6 million in WSIP public benefits, over 50 percent ($751.2 million for ecosystem improvement) are related to ecosystem improvements.
Chapter 3
Tentative Cost Assignment

Table 3-1. Potential Cost Assignment Percentages

<table>
<thead>
<tr>
<th>Purpose1</th>
<th>Agricultural and M&amp;I Water Supply Participants</th>
<th>Federal</th>
<th>Other State or Local Authorities</th>
<th>WSIP Public Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Capital</td>
<td>IDC + OM&amp;R</td>
<td>Capital</td>
<td>IDC + OM&amp;R</td>
</tr>
<tr>
<td>Water Supply Reliability2</td>
<td>97%</td>
<td>97%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Ecosystem Improvement3</td>
<td></td>
<td>25% IDC</td>
<td></td>
<td>75% IDC, 100% OM&amp;R</td>
</tr>
<tr>
<td>Emergency Response</td>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Recreation4</td>
<td></td>
<td></td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Flood Damage Reduction5</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1 Cost assignment percentage assumptions are based on existing Federal and State authorities, including the State of California Water Quality, Supply, and Infrastructure Improvement Act of 2014.
2 Water supply reliability cost assignments can vary, depending on the percentage of water supply delivered to wildlife refuges, which qualify for WSIP public benefits. IDC and OM&R costs are assigned to Federal wildlife refuge beneficiaries.
3 Capital costs allocated to ecosystem improvement can be assigned to the State (WSIP) up to 50 percent of the total capital costs. Seventy-five percent of remaining ecosystem improvement costs, if any, would then be assigned to Federal, per Public Law 89-72, as amended. One hundred percent of joint OM&R costs for ecosystem improvement are assigned to Federal, per Reclamation PEC P07.
4 Capital costs allocated to recreation can be assigned to the State (WSIP) up to 50 percent of the total capital costs. Fifty percent of remaining recreation costs, if any, would then be assigned to Federal, per Public Law 89-72, as amended. Fifty percent of OM&R costs for recreation are assigned to Federal, per Public Law 89-72, as amended.
5 Capital costs allocated to flood damage reduction can be assigned to the State (WSIP) up to 50 percent of the total capital costs. All remaining flood damage reduction costs, if any, would then be assigned to Federal, per Public Law 89-72, as amended. All OM&R costs for flood damage reduction are assigned to Federal, per Public Law 89-72, as amended.

Key:
% = percent
IDC = interest during construction
M&I = municipal and industrial
OM&R = operations, maintenance, and replacement
Table 3-2. Tentative Capital Cost Assignment for the Temperance Flat Reservoir Project

<table>
<thead>
<tr>
<th>Purpose/Action</th>
<th>Agricultural and M&amp;I Water Supply Participants</th>
<th>Federal</th>
<th>Other State or Local Authorities</th>
<th>WSIP Public Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assigned Percentage</td>
<td>Cost</td>
<td>Assigned Percentage</td>
<td>Cost</td>
</tr>
<tr>
<td>Water Supply Reliability</td>
<td>96.7%</td>
<td>$1,592.1</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Ecosystem Improvement</td>
<td>0.0%</td>
<td>$0.0</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Emergency Response</td>
<td>0.0%</td>
<td>$0.0</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.0%</td>
<td>$0.0</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>0.0%</td>
<td>$0.0</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Total</td>
<td>59.8%</td>
<td>$1,592.1</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
</tbody>
</table>

Notes.
1. July 2015 price level. All numbers are rounded for display purposes, and therefore line items may not sum to totals.
Key:
$ millions = million dollars

Table 3-3 shows the present value total project costs assigned to project TFR Project purposes, consistent with existing Federal and State law. These costs amount to $3,887.7 million. Also shown in Table 3-3, of the total project costs allocated for the TFR Project, 33.0 percent are estimated to be State WSIP public benefits, 5.1 percent are estimated to be Federal, 0.2 percent are other State and local costs, and 61.7 percent is assigned to water supply reliability. Of the $1,281.2 million in State WSIP public benefits, over 50 percent ($900.0 million for ecosystem improvement) are related to ecosystem improvements.
### Table 3-3. Tentative Present Value Total Project Cost Assignment Summary

<table>
<thead>
<tr>
<th>Purpose/Action</th>
<th>Agricultural and M&amp;I Water Supply Participants</th>
<th>Federal</th>
<th>Other State or Local Authorities</th>
<th>WSIP Public Benefits[^4]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assigned Percentage</td>
<td>Cost</td>
<td>Assigned Percentage</td>
<td>Cost</td>
</tr>
<tr>
<td>Water Supply Reliability[^5]</td>
<td>96.7%</td>
<td>$2,324.9</td>
<td>0.6%</td>
<td>$14.1</td>
</tr>
<tr>
<td>Ecosystem Improvement</td>
<td>3.4%</td>
<td>$37.4</td>
<td>14.5%</td>
<td>$158.5</td>
</tr>
<tr>
<td>Emergency Response</td>
<td>17.9%</td>
<td>$36.9</td>
<td>0.0%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Recreation</td>
<td>0.0%</td>
<td>$0.0</td>
<td>10.5%</td>
<td>$7.6</td>
</tr>
<tr>
<td>Flood Damage Reduction</td>
<td>0.0%</td>
<td>$0.0</td>
<td>17.9%</td>
<td>$19.6</td>
</tr>
<tr>
<td>Total</td>
<td>61.7%</td>
<td>$2,399.2</td>
<td>5.1%</td>
<td>$199.7</td>
</tr>
</tbody>
</table>

Notes:

1. Total project costs include capital costs, OM&R costs, and environmental mitigation or compliance obligations after completion of construction, and IDC costs. Assigned percentages are a composite of all assigned costs based on existing Federal authorities and the State of California Water Quality, Supply, and Infrastructure Improvement Act of 2014.
2. Costs are at a July 2015 price level. All numbers are rounded for display purposes, and therefore line items may not sum to totals.
3. IDC calculations assume full financing of project capital costs. Up-front WSIP funding for capital costs would reduce IDC.
4. Costs assigned to the State under WSIP are capital costs only, and do not include OM&R and IDC costs.
5. Assigned costs to Water Supply include interest; however, interest would not be included in actual agricultural repayment contracts per Reclamation Manual Directive and Standard PEC 05-01, Water Rates and Pricing (2013).

Key:

- `%` = percent
- `$ millions = million dollars`

[^4]: Costs assigned to the State under WSIP are capital costs only, and do not include OM&R and IDC costs.
[^5]: Assigned costs to Water Supply include interest; however, interest would not be included in actual agricultural repayment contracts per Reclamation Manual Directive and Standard PEC 05-01, Water Rates and Pricing (2013).
CHAPTER 4
REFERENCES

CALFED. See CALFED Bay-Delta Program.


______. 2000b. CALFED Initial Surface Water Storage Screening. August.

______. 2000c. CALFED Bay-Delta Program Final Programmatic EIS/EIR. July.


Reclamation and DWR. See U.S. Department of the Interior, Bureau of Reclamation and California Department of Water Resources.


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