



Date: April 19, 1996

To: BDAC Members

From: Lester A. Snow, Executive Director
CALFED Bay-Delta Program

Subject: Cost Estimates

Preliminary cost estimates have now been prepared for the ten draft alternatives. This memorandum describes how these costs were developed and presents a range of costs for the alternatives. Charts depicting the estimated capital costs for each alternative are attached. In addition, we will describe how cost information will be used during this Phase of the Program.

Development of Cost Estimates

The preliminary cost estimates developed in this first Phase of the Program were prepared based on information that is currently available. Cost estimates were developed for individual actions that make up each alternative, and then aggregated to prepare estimates for complete alternatives. There is a wide variation in the level of detail in the cost estimates between actions. Some actions have been studied extensively in the past, so costs and detailed work accompanying the cost estimates are available. In these cases, costs were simply updated to 1996 dollars. Costs for other actions have not been previously studied. These costs were estimated based on comparisons to similar actions. At this stage of the Program, there is very little detail describing the basis for these costs. These actions should be expected to have more cost variability, with costs expected to change when further detail is developed for actions and alternatives in future phases of the Program. In general, these estimates can be viewed as having $\pm 30\%$ error.

Capital costs for the current set of ten alternatives range from approximately \$4 to \$11 billion, with the exception of Alternative I. Alternative I capital costs are estimated to be \$12 to \$24 billion. This cost is expressed as a wide range because there is less information available from past studies of this alternative than there is for most of the other alternatives.

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CALFED Agencies

California

- The Resources Agency
- Department of Fish and Game
- Department of Water Resources
- California Environmental Protection Agency
- State Water Resources Control Board

Federal

- Environmental Protection Agency
- Department of the Interior
- Fish and Wildlife Service
- Bureau of Reclamation
- Department of Commerce
- National Marine Fisheries Service

The estimated capital costs by stage are shown in the attached charts. Note that all alternatives have equal costs for stages 1 and 2 (core actions and essential elements.) For subsequent stages, Alternative A is the least expensive and Alternative G is the most expensive. All other alternatives (except I) fall within the range between A and G. A separate figure is provided for the estimated capital costs by stage for Alternative I.

It is noteworthy that **some of the costs included here are borne by existing programs** that are already funded (especially core actions and essential elements), so that not all of the costs identified represent new costs. Also, it should be recognized that **the costs described for each alternative will not occur all at once.** In recognition of the fact that many of these actions require extended planning, each alternative has been split into a number of stages. Staging the alternatives also contributes to meeting the Solution Principle of affordability and enhancing adaptive management opportunities. Staging allows installment payments of capital costs and presents an early opportunity to achieve benefits from core and essential elements. In every alternative, many elements such as habitat restoration and levee stabilization will be implemented over as much as 20 to 30 years, and thus costs will be spread over that time frame.

Alternative Costs by Objective

In the attached graphics, the estimated capital costs for each stage are represented by the horizontal bars. The total capital cost for the alternative is the sum of the bars, shown at the far right side of the bottom bar. In addition, the graphic provides information as to the types of costs being incurred for the total alternative. This cost breakdown by primary objective is shown in the small pie chart next to the staged bars.

These costs have been categorized by the primary objective being addressed. It is a fundamental part of the Program that actions will address multiple objectives, so although actions and their associated costs are categorized by the primary objective that the action addresses, most actions will address other objectives as well. The extent to which actions address multiple objectives and produce multiple benefits has not yet been assessed. The graphic is only intended to demonstrate that various objectives will be addressed during each stage.

Using Cost Estimates

During Phase I each alternative will be evaluated for its ability to satisfy the Program's solution principles. As a part of this evaluation, the preliminary cost estimates will be used to consider how well alternatives satisfy the solution principles of equity, implementability and affordability. An alternative may be refined at this point to improve the effectiveness of

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actions in order to increase the alternative's benefits in relation to costs. This type of refinement will continue into Phase II.

As cost information is refined, Program staff will assess the extent to which actions address multiple objectives and produce multiple benefits. When eventual cost allocations are made across the Program's many objectives, it will be possible to apportion the costs of an alternative over many diverse beneficiaries. The goal is to allocate costs equitably so that each benefitting section contributes its fair share toward the solution. **No single sector or single revenue source will bear the cost of implementing the solution.** Additional information on the allocation of benefits and costs will be developed in future phases of the Program.

Attachments