DRAFT

BDAC Assurances Work Group Case Study for Discussing Assurance Needs and Issues

It is the Assurances Work Group's task to develop mechanisms to assure implementation of the final CALFED Bay-Delta Program solution. At its November 6, 1996 meeting, the Assurances Work Group asked CALFED staff to develop an example or case study and to present assurance issues based upon that case study. An example alternative, it was hoped, would allow more specific discussions of needs and the assurances to meet those needs. The Work Group recommended that the case study be based upon a dual Delta transfer facility alternative (i.e. water would be transported around the Delta, as well as through the Delta for exportation).

It is important to understand that a preferred alternative has not yet been identified through the CALFED Bay-Delta Program. This case study provides but one scenario of what a final solution developed through the Program might resemble. This case study should be used for illustrative purposes only. It serves as a vehicle for directly and specifically addressing some of the complex assurance issues that will face any solution reached through the CALFED Bay-Delta Program. A dual transfer alternative presents obstacles both to moving water around as well as through the Delta. Because this case study raises a variety of assurance problems, insight gained in developing assurances here may be applicable to any of the alternatives.

In addition, the Assurances Work Group is primarily concerned with assuring implementation of a solution, not in defining the solution. For this discussion, assume that a solution is acceptable, if the CALFED Program is able to provide adequate assurances. Obviously, if the development of assurances is problematic, this could have implications for the practicality of the alternative under consideration.

This paper is divided into two parts: Part I beginning on page 2 discusses the case study, and Part II beginning on page 12 describes example assurances for the case study. In Part I, staff drafted the case study to contain example actions that could be part of a final solution. The case study is described by its Program components (i.e., Ecosystem Restoration, Water Quality, Water Use Efficiency, Delta Vulnerability, Conveyance, Storage and Financing). The case study is to allow the Work Group to begin assessing differing methods of providing assurances. Part II suggests some alternative methods of crafting assurances for three elements of the case study.

PART I. CASE STUDY

Overview of Case Study: Action Elements

This section and the one following briefly describe the actions associated with the case study. In general, these actions can be broken into two categories: specific actions and programmatic actions. Specific actions are those actions that are both named and promised in the alternative (e.g., convert x land into y habitat). Programmatic actions are categories of actions that will take place where the Program does not specify which specific actions will take place (e.g., ecosystem restoration using adaptive management). The challenge for the Assurances Work Group is to find ways to assure the implementation of both the specific and the programmatic actions. Because the CALFED Bay-Delta Program is currently preparing a programmatic level environmental review, many of the initial CALFED solutions will be programmatic in nature.

The case study is necessarily written with a broad brush. It is designed primarily to meet the four program goals -- Ecosystem Restoration, Water Supply Reliability, Water Quality, and System Integrity. Secondarily, the case study is designed to make the problem of assurances more approachable. The case study is generally consistent with CALFED draft alternative 3.

The **Ecosystem Restoration objective** is addressed by: (1) a major habitat restoration program in and above the Delta (including both specific actions and an adaptive management program); (2) improvements in flow and diversion timing patterns (made possible by new storage, efficiency improvements, water purchases, and the construction of multiple export intakes); (3) improvements in diversion screening; (4) increased flexibility in the location of diversions (made possible through the construction of multiple export intakes); and (5) improvements in water quality.

The **Water Supply Reliability objective** is addressed by: (1) new storage elements, managed partly for increased out-of-stream supply; (2) construction of the dual Delta transfer facility to allow more efficient and more frequent movement of water across the Delta; and (3) the water efficiency and water market elements.

The **Water Quality objective** is addressed by: (1) specific actions and programs designed to improve water quality within and in the tributaries to the Delta; and (2) the construction of a dual transfer facility to improve export water quality

The **System Vulnerability objective** is addressed by: (1) programs to protect and upgrade existing levees; and (2) a program to upgrade emergency response to levee failure.

The case study incorporates two provisions specifically designed to make the assurance problem more manageable. The first provision is the adaptive management program for ecosystem restoration. Considering that there is considerable uncertainty in our ability to predict which restoration activities will be most beneficial, the inclusion of a high quality adaptive management program will significantly increase the likelihood that the solution will achieve meaningful restoration at a reasonable cost. The second provision is the selection of a dual transfer facility with limited capacity in the isolated component to help reduce concerns that export interests will seek to reduce expenditures on levee, water quality, and environmental protection in the future, particularly when the isolated component is too small to carry projected levels of exports.

If the case study spurs fruitful discussions of assurance issues, the Work Group may wish to increase the complexity of the case study in future iterations. The case study was designed to bring to light significant and difficult assurance issues; however, it probaby will not bring to light every conceivable assurance issue.

Case Study: Action Elements

1. Ecosystem Restoration (Represents all restoration activity, including Central Valley Project Improvement Act (CVPIA), etc.)
    a. Specific commitments
        i. Enhance existing habitat
        ii. Convert existing land uses to habitat
            (1) Create meander zones
            (2) Enhance vegetation on levees
            (3) Levee setbacks
            (4) Buffer habitat on the inside of levees
            (5) Convert agricultural land to managed wetlands
            (6) Convert Delta land to shallow habitat
        iii. Screen certain local intakes
        iv. Alter flow and temperature patterns to provide net fishery benefits. Flow benefits generated through combination of rules (changed flow/X2 standards) and market mechanisms.
    b. Programmatic commitments
        i. Set long-term restoration goals and objectives
        ii. Create a mechanism designed to meet long-term goals and objectives through restoration activities, while allowing discretion as to the means
        iii. Establish monitoring and evaluation process

2. Water Quality. Includes requirements and programs from other agencies, e.g., the Regional Water Quality Control Board.
    a. Specific commitments
        i. Undertake specific pollutant source control actions (agricultural and urban)
        ii. Mine drainage remediation programs
        iii. Environmental water quality standards
        iv. Delta salinity standards to protect Delta agriculture.

b. Programmatic commitments
   i. Water quality improvement program, based upon specific goals and objectives.
   ii. Implement watershed protection programs
   iii. Establish monitoring and evaluation process

3. Water Use Efficiency. Categories identical to those used in efficiency work group. Transfer element could be broken out if desired.
   a. Programmatic commitments
      i. Standardized rules for water transfers
         (1) Define transferable water
         (2) Mitigate local third party and environmental impacts
         (3) Streamline approval process
      ii. Water Reclamation
         (1) Define BMP
         (2) Eliminate institutional barriers to implementation
         (3) Implementation and monitoring program
      iii. Urban Water Conservation
         (1) Define BMP
         (2) Quantify targets
         (3) Implementation and monitoring program
      iv. Agricultural Water Efficiency
         (1) Define EWMP
         (2) Definite local planning process
         (3) Create incentive process
         (4) Implementation and monitoring program
      v. Refuge Efficiency
         (1) Define BMP
         (2) Create Incentive process
         (3) Implementation and monitoring program

4. Delta Vulnerability
   a. Specific Commitments
      i. Target levees for maintenance, repair, upgrades
   b. Programmatic Commitments
      i. Establish and implement emergency response program. Includes response to simultaneous multiple failures.
      ii. Establish and implement long-term maintenance and subsidence management plan
      iii. Seepage flood remediation program (mitigation for isolated system).

5. Conveyance
   a. Specific Commitments
      i. Construct dual conveyance facility.
      ii. Size the isolated portion of dual facility at 5,000 cfs
          A second alternative will size the isolated portion of the dual facility at 15,000 cfs.
          Either sized isolated facility will also include the following.
          (1) Screen intake
          (2) Operational rules -- new rules designed to meet ecosystem needs while simultaneously improving supply reliability. Represents sum of all constraints on operation from all sources.
              (a) Operate to achieve Delta fishery protection
              (b) Operate to meet existing Delta water quality requirements
              (c) Operate to meet export standards
              (d) Operate in real time to protect fish etc. near intakes
              (e) Meet all other existing laws, regulations, etc.
              (f) Coordinate project operations with other user and environmental controlled water (market transfers, discretionary environmental supplies, etc.)
      iii. Through Delta portion
          (1) Screened intake on Sacramento River
          (2) Operational rules as with isolated portion
      iv. Coordinated operations of the two facilities
          (1) South Delta pumping minimums set to assure protection of South Delta water quality and direct island deliveries or channel releases to protect water quality.
          (2) Beyond this level, first priority is isolated system diversions, with second priority south Delta diversions, when isolated diversions curtailed for biological reasons.
   b. Programmatic commitments
      i. Mechanisms to change operational rules as understanding of biological needs changes.

6. Storage Facilities
   a. Specific commitments
      i. Construct offstream storage facility north of the Delta.
          (1) Operations: Facility operated to benefit local users, export interests, and environment.
              (a) Fill during periods of low environmental impact, e.g., during falling limb of pulse flows
              (b) Water user share of storage operated to boost reliability for local and export uses, e.g., release storage to boost water supplies during dry years
              (c) Environmental share of storage operated to boost environmental flows during key periods, e.g., release storage to support flows during dry years or key seasons.

ii. Access 200,000 acre feet of groundwater space north of the Delta
   (1) Operations: pump during dry periods, refill through percolation and in lieu during other periods.
iii. 200,000 acre feet storage in Delta island(s).
   (1) Operations: Description similar to upstream storage
iv. Construction of local facilities to maximize groundwater storage potential within Kern Fan (via conjunctive use, percolation, etc.).
   (1) Operations: Description similar to upstream storage

b. Programmatic commitments
   i. Mechanisms to adapt storage operations based upon changing needs of users and changed understanding of environmental needs. Could lead to changed diversion patterns and/or changed discharge patterns in order to simultaneously provide environmental protection, restoration, and water supply reliability.

7. Funding: [Should be consistent with work of funding committee]
   a. Specific elements
      i. Detailed allocation of funding sources. All of the following elements used:
         (1) Diversion fees
         (2) GO bonds (for ecosystem restoration)
         (3) Revenue bonds (for facilities)
         (4) Federal appropriations
         (5) Existing funding sources
   b. Programmatic elements
      i. Mechanisms to alter funding or benefit patterns, based upon various contingencies
         (1) Shift funding based upon shifts in use patterns.
         (2) Reductions in funding after environmental goals and objectives achieved
         (3) Mechanisms to cope with possible future new endangered species.

Preliminary List of Assurance Issues Raised by the Case Study

Following is a preliminary list of assurance issues raised by the case study. Many issues raised by this case study would probably be raised by other scenarios. In the future, if the Work Group is able to craft adequate assurances for these issues, the assurances will probably be applicable to any solution that is selected.

1. Ecosystem Restoration

o **That the specific habitat restoration actions will be implemented.**

Which entities implement the various portions of habitat restoration?

Under what authority and organizational structure do these entities operate?

Has adequate and secure funding been provided?

Will necessary permits and approvals will be granted expeditiously?

What if a specific project cannot be implemented?

What happens if the needed expenditures exceed funding allocated?

Will local concerns be weighed by the implementing entities?

If local agencies implement specific restoration actions (e.g., improved screening), who assumes the cost if new actions need to be taken in the future (e.g., if the screens need to be upgraded)?

o **That instream flows and delta outflow will be provided.**

What entities will secure the changes in flow and diversion patterns?

What authority, funding, and organizational structure will these entities possess?

Under what conditions can these flow and diversion patterns be modified?

Can commitments for specific flow and diversion patterns be maintained should future development greatly increase the demand for water upstream?

How will third parties and local environments be protected?

Will the environmental flows interfere with the exercise of water rights in the future?

Will increased environmental flows place existing users at greater risk by lowering average reservoir levels or by inducing groundwater overdraft?

o **That the adaptive management program will be implemented and durable.**

How does the Program assure stable goals and objectives?

Can the Program be insulated from future political interference?

Is there adequate and secure funding?

Does the entity that directs the adaptive management program have adequate authority and an organizational structure that will operate efficiently over time?

What mechanisms are in place to assure the scientific integrity of the Program?

How will Program goals be prioritized (e.g., as between supporting commercial fishing versus supporting endangered species)?

What will prevent the adaptive management program from allocating resources poorly, such that external mechanisms kick in and reduce benefits to other interests (e.g., could the Program allocate funds to salmon population improvement, allowing another species to become endangered, triggering an endangered species act listing and new regulations on flows and exports?).

How will the Program coordinate operations with other parties?

What if the goals and objectives of the Program cannot be met without additional funds?

2. Water Quality

o **That the specific water quality actions and programs are implemented.**

What entities are charged with securing the improvements in water quality?

Do these entities have adequate authority and funding?

How are these entities organized?

What if the needed expenditures exceed funding allocated?

Can commitments for specified water quality standards be maintained should future development greatly increase the demand for water?

How can water quality actions be coordinated with ecosystem and water supply actions to assure that limited financial resources are spent effectively?

3. Water Use Efficiency

o **That efficiency programs for urban, agricultural and environmental uses will be implemented.**

What mechanisms will assure that reclamation, urban BMPs, agricultural plans, agricultural EWMPs, and refuge efficiency BMPs will be implemented?

What is the assurance that the efficiency programs will be upgraded as technology advances?

Are there standardized rules for water transfers adequate to assure that a vigorous market will develop and that third party impacts will be minimized or mitigated?

4. **Delta Integrity**

o **That actions to maintain delta levees and channels will be implemented.**

What entities will implement the various elements of an emergency management and response plan?

What entities will implement the remainder of the plan?

Do these entities have adequate authority and funding?

Will necessary permits and approvals will be granted expeditiously?

What if a specific project is blocked?

What if the needed expenditures exceed funding allocated?

How will coordination take place between the ecosystem restoration programs (both specific actions and adaptive management) and the levee stability programs?

5. **Conveyance**

o **That conveyance actions are implemented.**

How does the Program assure that new conveyance facilities will be permitted, funded and constructed?

How does the Program assure that a new conveyance facility will be operated as agreed?

Are there compensatory mechanisms if a promised facility is not built?

How does the Program assure that foreseeable changes in regulatory constraints will not impair or preclude conveyance facilities or operations?

What entities operate new conveyance facilities?

How does the Program assure a new facility will be operated as agreed?

What are the assurances that new markets made possible by new conveyance will not damage rural economies or environments or that appropriate mitigation is implemented?

Does a smaller isolated facility pose a smaller threat than a large one, for the environment, Delta farmers, and upstream interests?

What institutional and financial barriers exist to prevent expanding the size of the isolated facility, once it is built?

6. **Storage Facilities**

o **That storage actions are implemented.**

How does the Program assure that facilities will be permitted, funded and constructed?

How does the Program assure that foreseeable changes in regulatory constraints will not impair storage improvements?

How does the Program assure that conjunctive use and banking programs will not impair local economies or environments, or that appropriate mitigation is implemented?

What entities will manage the facilities?

How does the Program assure that the facilities will be operated as promised?

How will three separate interests (local, export, and environmental) be able to cooperatively manage a facility?

7. **Finance**

o **That financing actions are implemented.**

How does the Program assure that financing for each program element will be identified and provided?

8. **General**

o **That a process be developed to address unforeseen circumstances that prevent key elements of the solution from being implemented or operated as agreed.**

o **That the Program not alter the water rights system.**

o **That mitigation and monitoring be implemented.**

o **That public participation be provided throughout implementation.**

Recognizing Linkages

Uncertainties in the relationship between future actions and future outcomes cause assurance problems which ripple through the program. For example:

o Uncertainty about how best to restore the ecosystem implies that the CALFED Program must include an adaptive management element in its solution. But if the ultimate shape of the ecosystem restoration program (including habitat restoration, screening, improvements in water quality, changed flow and diversion patterns, etc.) is uncertain, then future land use and water diversion patterns are also necessarily uncertain. This complicates the development of assurances for the "water reliability" goal and the and "no significant redirected impacts" solution principle.

- o If the amount of money that will be needed for ecosystem restoration (including protection of endangered species) is left open to reduce environmental uncertainty, then the ultimate costs to water users and the general public is uncertain. If the ultimate cost of ecosystem restoration is capped up front, funders will have greater certainty, but the likelihood of successfully meeting ecosystem goals and objectives is reduced.

- o If the behavior of any institution in the future is uncertain (the institution could act in unexpected ways), one way to reduce institutional uncertainty is by hardwiring specific actions into the CALFED Program -- specific mandates to reduce discretion or physical solutions which reduce the ability of any institution to use its discretion. But reducing agency discretion before optimal operations are known reduces the chances that the solution will be able to generate all the benefits possible.

Thus, it is somewhat artificial to discuss the assurance implications of the example component by component, because assurance needs in one area are generally closely related to assurance needs in other components. On the other hand, using the component framework will allow discussion of assurances in a systematic way.

PART II. CRAFTING ASSURANCES FOR PORTIONS OF THE CASE STUDY

Because even the preliminary list of assurance issues raised by this case study is lengthy, staff identified three elements of the case study that raise particularly complex and/or contentious assurance issues. The three elements of the case study on which the Work Group will begin discussing and assessing specific methods of assurance are the following:

- construction and operation of an isolated facility with a capacity of 5,000 cfs and in the alternative, construction and operation of an isolated facility with a capacity of 15,000 cfs;
- implementation of an adaptive management program for ecosystem restoration; and
- construction and operation of a 1 million acre feet storage facility north of the Delta.

In discussing assurance issues associated with these three elements of the case study, it is clear that not every assurance issue will be raised. The reader is asked, therefore, to be less concerned with whether some assurance issues have been left out of this discussion than with whether the assurances issues that are discussed are properly analyzed.

Some of the key assurance issues associated with these elements might be characterized as follows:

- That promised facilities will be built.
- That specified restoration projects will be implemented.
- That facilities will be operated as promised.
- That the ecosystem restoration program will achieve high levels of ecosystem restoration.
- That the payments called for in the solution will not be superseded by higher, unexpected payments later.

A word of caution is necessary, the CALFED Program cannot promise that all of these assurance needs will be met, and met to everyone's satisfaction. In addition, the CALFED Program's task is to assure that a solution is implemented and operated as agreed. That is a very different proposition from guaranteeing each and every outcome of the Program. Participants in the CALFED Program process must reach their own decisions about whether the solution meets their needs and presents a high likelihood of success. Once an interested party has reached that conclusion, assurances will help implement that solution and govern its operation. Additionally, each of these decisions will be made in a climate of at least some uncertainty. No program or assurance can guarantee protection against any eventuality. The CALFED Program staff has proposed establishing a process to address circumstances that may prevent a key element of the overall solution from being implemented or operated as agreed. Development of such a process will be discussed in future staff papers.

An example of the imperfections implicit in assurances for an adaptive management program for ecosystem restoration rests in the difficulty of assuring outcomes of the restoration efforts with a funding source that is fixed and defined in advance. Another example, of the limitations of assurances is the inability to assure that all sides will get all the water and the water quality they expect, given the possibility of future climate change and sea level rises. Providing assurances means developing mechanisms that provide interested parties confidence that the benefits of implementing the solution outweigh the costs and risks.

Differing Approaches for Crafting Assurances

One approach to developing assurances is to develop one set of assurance tools for conveyance, another set for storage, and another set for ecosystem restoration, then to seek to combine these various tools in different ways. Given how tightly linked the conveyance, storage, and ecosystem elements are, a more efficient approach to developing assurance mechanisms may be to look at the kinds of tools that could satisfy the assurance needs of all three elements simultaneously, and focus on those. Therefore, this section will begin with a discussion of the linkages between the elements, then present several examples of integrated approaches to assuring implementation of these elements.

The need for assurances arises primarily because of the possibility of discretionary action in the future. If the CALFED solution could be boiled down to a simple set of well defined actions: facilities, restoration, levee programs, operational rules, etc. then, in theory, the problem of assurances would be relatively simple. We could write laws, contracts, and regulations for implementation of well defined actions. Then, we could link together the actions desired by various entities so that they must support the entire package if they want their own piece.

The reality is more complicated, for a number of reasons. Among them:

- Some stakeholders feel that all legal assurances will ultimately break down, given enough demographic and economic pressure from export areas.

- To some extent, the case study solution is based upon the creation of infrastructure and assumes that discretionary actions will take place in the future using this infrastructure. For example, the increased Delta conveyance capacity will open the door for a more active water market, without specifying in advance what trades will take place. Thus, the assurances will need to deal with possible undesirable side effects of markets. These kinds of assurance issues will not be dealt with in this iteration, but will be incorporated into future drafts.

- Uncertainties in our ability to accurately specify the actions needed for ecosystem restoration imply that the ecosystem restoration will rely heavily upon future discretionary actions. The assurance problems caused by uncertainty in biological relationships are central to the purpose of this paper -- which is to explore the direct assurance implications of the conveyance, storage, and ecosystem restoration elements of the case study.

The Unique Assurance Difficulties Presented by Ecosystem Restoration

Given a solid understanding of how to restore the ecosystem, finding the appropriate balance between new benefits, and cost/risk might be relatively straightforward. We could simply define a restoration plan in terms of actions -- habitat restoration, modification of diversions, instream flows, entrainment, facilities, water quality improvements -- with assurances that those actions would be carried out. Unfortunately, our understanding of the relationship between desirable ecosystem qualities (populations, resiliency, etc.) and possible management levers (changes in habitat, flows, diversions, diversion points, water quality, etc.) is relatively primitive.

The CALFED Program cannot wait until such information is beyond dispute. It must develop consensus around a solution within just a few years. The solution, therefore, will of necessity be a programmatic one. That is, instead of specifying all the physical and management answers to restoration ahead of time, CALFED must instead create a high quality management structure capable of restoring the ecosystem within a specified budget.

An adaptive management approach to ecosystem restoration seems to provide the most promising approach for achieving restoration in the face of current uncertainty. In an adaptive management strategy, goals for restoration are defined, but the specific means of achieving those goals is not specified. Adaptive management determines the appropriate means for achieving the goals through studying, funding and monitoring restoration projects and adjusting its efforts based upon the information that is produced. Over time, the structure is able to take more and more effective and efficient steps toward restoration because it has learned from past experience what works best.

Our inability to precisely predict the response of the ecosystem to various management changes has led us to conclude that future environmental management must be flexible enough to deal with changing information and circumstances. This flexibility injects a certain amount of uncertainty throughout the system. For example, if a solution call for the discretion to change future flow, storage, and diversion patterns to benefit the environment, then flow, storage, and diversion patterns for water users will necessarily be affected. Additionally, future water user actions may also affect the environment as well. For example, the more active future water markets become, the greater the degree to which in stream flow and diversion patterns could diverge from predicted patterns.

In light of the above discussion, the adaptive management structure for ecosystem restoration is paramount to resolving the problems of each of the elements of the case study. If the Program can develop an adaptive management program which generates ecosystem restoration while retaining water user supply reliability and limiting the exposure of funders to unexpected expenses, then the Program has gone a long way toward generating an assurance package. The ecosystem adaptive management program should, therefore, have the following characteristics to satisfy simultaneously the need for assurances by environmental interests, water users, and other funders.

o Scope of Authority. The management structure should be able to operate in all ecosystem management arenas for which future discretion is desirable. This includes land acquisition, habitat restoration, screening, flow modification, diversion pattern modification, and water quality management.

In general, the structure should not have the authority to negatively impact water users without compensation. Thus, the authority could not simply force reductions in export diversions below agreed levels to protect fish. It might, however, be able to trade off lower exports at one time for higher exports at another time (as the ops group does now) or it might purchase water in the export area from willing sellers to allow reduced exports without supply impacts. A corollary is that all institutions which could negatively impact water users must be within the adaptive management umbrella It does no good if the structure commits not to harm water users if ESA agencies remain outside the tent.

However, in cases where the restoration plan is demonstrably failing (e.g., new species listings), additional funding or other impacts might be mandated. Whether this would occur would depend upon how the risks of failure are allocated as between the environment and the fenders (see below).

o Mission. The primary mission of the management structure should be ecosystem restoration. What constitutes success and even more important -- failure -- in that mission should be defined as clearly and as explicitly as possible.

o Funding. Restoration will take place over an extended period. Restoration can only be assured if adequate resources to complete restoration are assured. The highest assurance would be generated by requiring fenders to meet the restoration goals, no matter what the cost. However, as discussed above, fenders will demand assurances against open ended cost arrangements. Another approach would be to guarantee a fixed revenue stream (or other types of property). However, for a fixed revenue stream, the risk remains that funding will be inadequate to meet restoration goals. That risk can be reduced, but never eliminated, by increasing the size of the revenue stream. How risks might be allocated is discussed below.

o Governance. The structure should be controlled by the entitie(s) which bear responsibility for failure. If the environment itself bears the risk of failure (i.e., the structure cannot bring additional resources to bear on the problems if the original endowment is inadequate), then environmental interests should control the structure. To the extent that the restoration managers have the ability to impose costs on other parties (e.g., the water users) those parties should be included in the management structure.

o The Distribution of Risk. The governance, funding, scope of authority, and distribution of risk are all intimately related. Those who accept risk should be rewarded via governance, funding, and scope of authority. To take the two extremes:

1. The environment assumes the risk of failure (i.e., fenders will not be impacted if the restoration plan fails to reach targets).

   The structure should be dominated by environmental interests.
   Funding should provide a large margin of safety.
   The structure has no authority to seek additional resources from the fenders.

2. The fenders assume the risk of failure (i.e., fenders must assure that the restoration meets its targets).

   The structure would be dominated by funder interests.
   Funding would be provided only as necessary to meet targets.
   The structure would routinely assess the fenders for additional resources.

The most appropriate distribution of risk might be somewhere in the middle.

Management Structures

In order to assure that the needs associated with the conveyance facilities, storage facilities, and ecosystem restoration elements of the case study are provided, following is a variety of management structures to help meet those assurance needs. These approaches are designed to promote discussion and are not complete and/or final proposals. For example, there is nothing in these examples about levee protection, assurances about the operation of water markets, protection for groundwater basins, and so on.

1. Existing Institutions

This alternative is based upon using existing institutions to the degree possible. A Joint Powers Agreement is suggested, however, to govern and coordinate the expenditure of money for ecosystem restoration.

Elements:

- o DWR and USBR jointly construct the Delta transfer facilities and all storage facilities. Funding for the facilities is based upon water user fees.
- o DWR and USBR jointly operate the Delta transfer facilities and all storage facilities.
- o DWR and USBR are made responsible for meeting new and more stringent environmental standards, based upon a new coordinated operating agreement (COA). Existing Delta water quality standards for agriculture must also be met. These new requirements subsume all existing requirements, including CVPIA and ESA requirements.

- The environmental requirements are locked in place through (1) a new SWRCB standards and a water rights decision and (2) language in the bonds used to finance the facilities, federal legislation.

- The adaptive management program is controlled through a JPA between USFWS, USBR, EPA, NMFS, DWR, and DFG. The IEP is used as the technical arm of the JPA. The JPA specifies that each agency will spend restoration funds, including CVPIA restoration funds, Prop 204 funds, federal matching funds, and additional restoration funds in accordance with priorities set by the JPA. The restoration funds may be used to purchase and restore habitat, purchase water above standards, buy out exports, fund efficiency measures, fund water quality measures, and other actions designed to support the environment.

- JPA decision-making by consensus. This implies that a default program will need to be developed.

- 50% of all JPA restoration funding reserved for compensation for impacts of any new ESA listings.

- The JPA may alter export patterns on a temporary basis if all the agencies agree.

- The JPA may, periodically, approach the SWRCB with a request for changed flow and export requirements, based upon new understandings of biological needs.

Advantages:

- Requires minimal institutional tinkering, though a new USBR/DWR COA and a multi-agency JPA are required.

- Keeping DWR and USBR in charge of new operations reduces complexity of operational decision-making. That is, environmental flow benefits generated through new standards, not a new operational overlay.

- Builds upon Operations Group and CALFED agency coordination of past several years.

- JPA structure allows for flexibility (if agencies are united, then have the authority to alter restoration program and to recommend changes to the SWRCB) and security (individual agencies can veto unacceptable proposals).

- Some measure of regulatory certainty provided by requirement to dedicate 50 percent of funds to compensation, if a new ESA listing occurs.

Disadvantages:

- o Management through consensus among agencies is cumbersome. Veto power by individual agencies could mean gridlock. But if allows for decisions based upon majorities, then would be intruding on agency authorities.

- o If JPA is not an effective implementation instrument, then the entire package is at risk, since failure to achieve restoration would lead either to environmental attacks or to efforts to increase funding levels.

- o Guarantees on operations may be viewed as weak. State and federal fishery agencies and the SWRCB may be vulnerable to political pressure.

Possible variations:

- o Incorporate some sort of HCP program. In such a program, exporters would commit to funding in return for assurances that there would be no regulatory surprises. However, given uncertainty over system biology, level of funding required to achieve high regulatory certainty might be very high.

2. Environmental Trustee

Elements:

- o Creates new environmental trustee agency. Agency has authority to buy and sell water, purchase and restore habitat, fund efficiency, fund reductions in pollution, etc.

- o Trustee takes control of portions of CVPIA restoration funds, prop 204 funds, and future restoration funds. Income assured by contract between trustee and funding agencies.

- o HCP approach provides substantial insulation to exporters against future impacts from regulations. For example, in return for high levels of funding, the trustee commits to compensate for impacts from new regulations, up to some threshold.

- o Governance/ Funding. Dominated by environmental interests.

- o DWR and USBR control a share of Delta conveyance capacity and new storage.

- o The environmental requirements are locked in place through (1) a new SWRCB standards and a water rights decision and (2) language in the bonds used to finance the facilities, federal legislation.

- o DWR and USBR are responsible for meeting new and more stringent environmental standards, based upon a new COA. Existing Delta water quality standards for agriculture must also be met. These new requirements subsume ESA requirements, but not necessarily the CPVIA requirements.

- o Trustee owns a share of Delta conveyance capacity, and new storage. May use these at its discretion in support of ecosystem goals, including selling water, storage, and conveyance capacity. CVPIA b(2) water becomes part of the endowment of the trustee.

- o Trustee uses all resources at its disposal -- money, water rights, storage rights, conveyance rights -- in support of ecosystem goals. Has the right to protect flows above minimum standards from diversion.

Advantages:

- o Administration of ecosystem restoration much less cumbersome -- no consensus among agencies required.

- o Focus on market approaches to restoration increases efficiency of implementation, reduces conflict with DWR and USFWS.

- o Environmental dominance of trustee reduces risk that economic/ political considerations could distort trustee actions. Also, market mechanisms provide safety valve (trustee may decide to sell water, if price offered allows for net environmental benefits).

- o Indemnity to exporters increases regulatory certainty.

- o Existence of indemnity gives incentive for trustee to head off ESA type problems before they lead to listings.

Disadvantages:

- o Requires substantial institutional change. Would take over responsibilities of numerous existing agencies. Would require shifting of CVPIA money and water from USFWS.

- o Governance a weak point. How to assure that control of trustee remains in hands of environmental interests?

- o Environmental restoration through markets not well tested.

- o Trustee control over portions of storage and conveyance facilities could complicate operations.