

## PCT/ERT PRELIMINARY REVIEW OF 10 ALTERNATIVES

### INTRODUCTION

The following presents the results of a preliminary evaluation performed at the Friday, March 22, 1996, PCT/ERT Meeting on the list of 10 alternatives developed for the CALFED project.

An overview of general comments and key criteria is provided first, with key evaluation descriptions and suggested improvements summarized for each alternative thereafter. Table 1 provides an overall summary matrix of the positive and negative aspects of each alternative along with issues that still will need to be addressed. Within this table, the eight criteria used in the preliminary evaluation were condensed into three groupings. The first grouping, Ecological Criteria, includes the following evaluation factors: (1) Aquatic Habitat; (2) Wetland/ Upland Habitat; and (3) Species of Interest. The second grouping, Water Supply Criteria, contain: (4) Reducer Water Supply Conflicts; and (5) Reduce Water Supply Uncertainty. The final grouping, Water Quality Criteria, contain the final three evaluation factors: (6) Drinking and Recreational Water Quality; (7) Agricultural/ Industrial Water Quality Requirement; and (8) Infrastructure, Resource/ Land Use, and Water Quality Vulnerability.

### GENERAL COMMENTS

Most participants felt that more information is needed on operations and operational specifications for the various alternative actions to adequately judge the relative performance of the alternatives.

All isolated facilities should be phased and start with a smaller facility (5000 to 7000 cfs). How an isolated facility would affect the Delta is quite uncertain; thus beginning with a smaller facility would allow an opportunity to better understand the facility's impacts on the Delta. An open channel isolated facility can easily be upgraded to increase capacity. A close system (pipeline) should be avoided as it limits future capacity upgrades.

Additional general comments are listed below.

- The alternative must have the ability to store water during high flow times.
- For all isolated transfer facilities, multiple diversion points would increase flexibility
- If In-Delta storage is considered, the ecosystem would incur less impact if the storage facilities were linked to Clifton Court Forebay. The link would cause stored export water to be pumped from the Delta only once, rather than twice, thereby halving the potential impacts to Delta aquatic species.
- For all groundwater recharge components, San Joaquin Valley contaminated groundwater hot spots must be avoided.
- An assumption that the restoration of aquatic habitat will directly lead to fish population increases should be re-examined.

- Taking problematic lands out of production is much more effective than source control or retaining agricultural discharges to improve water quality for all beneficial users.
- A separate performance measure is needed for recreational aesthetic quality.

#### **ALTERNATIVE A: EXTENSIVE DEMAND**

The reduced demand would result in an increased ability to retain water in Shasta, thereby allowing better management of Sacramento River temperature conditions. More water through the Delta would be very beneficial to both water quality and the ecosystem.

Currently the salinity standards at Vernalis are controlled through New Melones releases. Salinity levels at Vernalis would only be improved if the salinity standards are changed. If not, the additional Delta outflow would improve New Melones flexibility, but the salinity levels may not improve.

This alternative would be improved by adding extensive habitat restoration.

#### **ALTERNATIVE B: NEW STORAGE TO IMPROVE DELTA FLOW**

Because storage would be for multiple use and not environmentally dedicated, this alternative may potentially be worse ecologically than the present conditions if flows that currently exit through the Delta are stored and are not released at the proper time.

#### **ALTERNATIVE C: DUAL DELTA CONVEYANCE**

The rating of this alternative can change significantly depending on the location of the lands to be retired. If the retired lands are primarily in Delta, it would substantially reduce the diversion effects. If the retired lands are in San Joaquin Valley, the greatest benefits would be derived from the reduction in salinity and toxins.

The 100 TAF of water that would be obtained in the San Joaquin River basin for release as spring pulse flows may not be adequate. The isolated facility could create problems with flow circulation in the central Delta. Also we can not assume that this alternative will increase water supplies by reducing carriage water requirements.

This alternative could be improved if there were multiple diversion points which could provide flexibility at low flow times. The isolated facility may be configured with turnouts to provide water to dead-end sloughs to improve flow circulations. The isolated facilities can also improve SDWA water quality if water were provide directly from the facilities instead of from the Delta channels.

#### **ALTERNATIVE D: THROUGH DELTA CONVEYANCE**

This alternative may be better for migrating fish in Sacramento and San Joaquin, but may not be very good for Delta fish. Tidal habitat may be increased due to the increased width of channel

cross section. An increase in boat traffic due to wider channels could potentially cancel any increase in habitat, and may even be worse for tidal freshwater habitat. It will also increase fish movement across Delta from Sacramento. This alternative would not greatly improve water quality since the salts would still enter from western Delta and from agricultural drainage on the Sacramento River, San Joaquin River, and Delta islands.

A no-wake zone would need to be created at the north fork of Mokelumne to protect the tidal habitat. To counter the cross-Delta fish movement, greater Delta outflow would be required during the February to June transport period to overcome potential losses to Delta. Greater San Joaquin River flow would also be needed to flush Delta and minimize movement of fish from the Central Delta to South Delta pumping plants.

#### **ALTERNATIVE E: DELTA CHANNEL HABITAT AND CONVEYANCE**

This alternative would not greatly improve water quality since the salts would still enter from the western Delta and from agricultural drainage on the Sacramento River, San Joaquin River, and Delta islands. It would also increase fish movement across Delta from Sacramento.

To counter the cross-Delta fish movement, greater Delta outflow would be required during the February to June transport period to overcome potential losses to Delta. Greater San Joaquin River flow would also be needed to flush Delta and minimize movement of fish from the Central Delta to South Delta pumping plants. This alternative does not have in-Delta storage so there is very little flexibility for timing of release.

The downstream diversion point at Walnut Grove is preferred over Hood because of the enlargement of Steamboat Slough. Less salmon young would be exposed at Walnut Grove than at Hood.

#### **ALTERNATIVE F: EXTENSIVE HABITAT RESTORATION WITH STORAGE**

This alternative would not be able stand alone. Water quality for all beneficial users would not be greatly improved. Alternative F is insufficient in terms of habitat restoration activities and the provision of environmental water (100 TAF) in the San Joaquin Valley. This alternative includes in-Delta storage of 400 TAF. Groundwater seepage from the storage facility may be of concern given the type of soil on which the facility would be built. It may also be a better idea to place the storage facility near the Delta but not In-Delta to minimize potential concerns with levee stability and land use conversion problems.

#### **ALTERNATIVE G: EAST-SIDE FOOTHILLS CONVEYANCE**

The overall through-Delta flow would be decreased which would have negative impacts on water quality in the South Delta. Since the East-Side Foothills facility would be used for supplementing Mokelumne, Calaveras, and Stanislaus Rivers, it would reduce the benefits that it provides from taking the South Delta pumps out of operation.

## **ALTERNATIVE H: CHAIN OF LAKES CONVEYANCE**

The storage component of this alternative gives the flexibility of release water during critical conditions. Land retirement may provide the most benefit to reduce ecosystem toxicity and salinity levels in comparison to source protection efforts or retaining of agricultural drainage. It would be beneficial to have the flexibility to spend the funds accordingly (i.e., additional money allocated to land retirement).

Chain of Lakes may be creating a habitat for predator fish. Algal blooms and water hyacinth, and turbidity due to drawdown of the lake or wind induced erosion may be operational constraints. The lakes can potentially support a new eco-community, which can be of great concern.

Less Delta outflow is expected with this alternative; therefore the South Delta water quality would be worst than existing conditions. Releasing water from the lakes during July through August may be most important in reducing the salinity levels in the Delta. Currently the salinity standards at Vernalis are controlled through New Melones releases. Salinity levels at Vernalis would only be improved if the salinity standards are changed. If not, the additional Delta outflow would improve New Melones flexibility, but the salinity levels may not improve. To ensure more equitable water quality, the agricultural and industrial users would need to be supplied directly from the chain of lakes instead of the Delta canals.

## **ALTERNATIVE I: WEST SIDE CONVEYANCE AND RIVER RESTORATION**

This alternative may have some of the best ecosystem benefits, drinking water quality benefits, and perhaps best flood control benefits of the 10 alternatives. However, it is not very beneficial for the San Joaquin area. Agricultural water quality may be improved if the west-side canal were used to supply the agricultural customers.

It is unknown whether there would be enough water in the new storage facility to meet all export demands. This alternative would be improved if the existing export pumps remained at their current locations for emergency use.

## **ALTERNATIVE J: EAST-SIDE CONVEYANCE**

With isolated transfer facilities coupled with no storage component, reduction in Delta outflow is expected. Saltwater intrusion would still be a problem for the South Delta. If the cross-Delta flow is eliminated and Delta outflow is reduced, the water quality in the South Delta may be worse than the current situation. Currently the salinity standards at Vernalis are controlled through New Melones releases. Salinity levels at Vernalis would only be improved if the salinity standards are changed. If not, the additional Delta outflow would improve New Melones flexibility, but the salinity levels may not improve. Water quality equity among users would be better if the agricultural and industrial users also received water directly from the isolated facilities instead of from the Delta channels.

This alternative needs storage capacity to supply export demands at key environmental times. South of Delta storage is more effective than Delta storage. In-Delta storage is more limiting since it can only be used for Delta outflow. North of Delta storage can be fed to outflow of exports during critical periods.