

**Environmental Water
Account**

E - 0 0 5 5 6 7

E-005567



Memorandum

Date: May 6, 1999

To: CALFED Policy Group

From: Lester A. Snow

Subject: Water Management Strategy - Environmental Water Account

Summary

The DNCT/EWA team has completed "gaming" several scenarios. Primary rules for managing EWA and an accounting method were tested and preliminary biological rules were applied. As a result of the gaming exercise, **all members agree that an Environmental Water Account has definite potential to provide long term benefits to fishery resources while providing improvement in water supply reliability and water quality benefits. The team recommends that EWA gaming and evaluation should continue to refine the size and mix of assets, rules of operation and evaluation and accounting procedure.**

Action: Information and Recommendation

Detailed Discussion

DNCT conducted several simulations to better understand how an Environmental Water Account (EWA) might have been operated, if it had existed during the 1991 through 1995 water years. The EWA would be, effectively, a water project for the environment. The EWA would have income, rights to facilities, and the ability to buy and sell water. It would also have the right to manipulate the operations of the state and federal Projects, provided that it could assure that the Projects would not be harmed by EWA activities. In these simulation, the EWA controlled a network of high (and low) priority storage rights from Shasta Dam, to Delta Island storage, to the Kern Water Bank. The EWA controlled a series of contracts giving it the right to purchase water in any given year. It had the right to allow variances to the Export/Inflow standard in order to generate environmental water. Finally it had an income of \$30 million per year for water purchase.

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
U.S. Army Corps of Engineers

Department of Agriculture
Natural Resources Conservation Service
Department of Commerce
National Marine Fisheries Service

Using this collection of facilities, contracts, rights, and income, the DNCT demonstrated that it is possible to make major shifts in Project operations to protect fish and to improve habitat conditions without reducing water supplies to the water users. The DNCT continues to analyze the extent of the biological benefits generated during the course of the game, but the initial impression from members of the DNCT has been very positive. A summary of operational insights gained in the gaming process and the level of benefit provided by each asset will be presented at the policy meeting.

Five gaming scenarios have been identified to evaluate the EWA using different assumptions about baseline conditions, EWA assets, accounting approaches, and other criteria. Scenarios will assume assets are in place at a certain periods of Stage 1. Each scenario game will be evaluated for fisheries, water supply and water quality.

The five gaming scenarios include:

Scenario Game No	Baseline Conditions	Period in Stage 1	Accounting Approach
1	Accord + VAMP + All AFRP + Trinity	Middle	Gallon for Gallon
2	Accord + VAMP + All AFRP + Trinity	Late	Gallon for Gallon
3	Accord + VAMP + All AFRP + Trinity	Late	Credit
4	Accord + VAMP + All AFRP + Trinity	Early	Gallon for Gallon
5	Accord + VAMP + without In-Delta AFRP + Trinity	Late	Gallon for Gallon

Choosing the assets that reasonably could be available for the EWA at a certain period of Stage 1 is a difficult task. An example is given below:

Scenario 2- End of Stage 1

This scenario was based on the assets, tools, and facilities to be in place at the end of Stage 1. The DWRSIM base operation studies used as a default for State and Federal water project operations in the absence of an EWA used the following assumptions:

- 1995 Level of Development
- Accord + VAMP
- All AFRP
- Trinity flows
- South Delta Improvements (10,300 cfs at Banks)

- Unlimited JPOD
- Gravelly Ford storage (200 TAF)
- Kern Water Bank storage (200 TAF)
- Shasta Storage (50 TAF)
-

The possible water supply measures included in this scenario and the sharing between the EWA and the water users is summarized in the following table.

Possible Water Supply Measures	Details	EWA/Water Users Division
South Delta Program -10,300 cfs Banks	10,300 Banks 4,600 Tracy	Users below E/I EWA above E/I
JPOD	No state or Federal sublimits apply	Projects below E/I EWA above E/I
Allow E/I variances		
Allow in-Delta AFRP variances		
Kern Water Bank	300 TAF storage 20 TAF/Mo in & out	200 TAF Projects 100 TAF EWA
Semitropic high priority storage	200 TAF storage 20 TAF/Mo in & out	EWA
Gravelly Ford Groundwater	300 TAF storage 20 TAF/Mo in & out	200 TAF Projects 100 TAF EWA
Shasta Dam Expansion	New 50 TAF storage	EWA
Webb Tract	120 TAF storage 2,000 cfs in/out	Projects
Bacon, Woodward, Victoria	200 TAF storage 4,000 cfs into island 2,000 cfs 2-way connector to CCF	EWA
ET reductions on Delta storage islands	60 TAF/yr average	Project 15 TAF/yr EWA 45 TAF/yr
SOD water purchase options	No limit, but see price schedule	EWA
NOD water purchase options	No limit, but see price schedule	EWA

Possible Water Supply Measures	Details	EWA/Water Users Division
Spot Purchases	No limit, but see price schedule	EWA
Demand shifting	100 TAF. Short term storage lease in San Luis	EWA
Screen at all south Delta exports intakes	State-of-Art screens at all locations	
Access Surplus Capacity		EWA

Other features of this scenario include:

Initial Conditions

- o All EWA storage is 50% full at the beginning of the game.
- o EWA starts w/ \$30 million.

EWA Budget

\$30 million/year, paid on October 1 of each year. Funds may accrue. The EWA may borrow up to \$30 million of future income. EWA funds accrue interest at 5% per year. Borrowing costs 5% per year. Capital costs for assumed facilities are outside the game. EWA may build up its fiscal reserves by selling or leasing its rights to water or facilities.

Price Schedules

Discretionary and operating costs must be paid for using the EWA budget. These costs include:

- o Cost of options
- o Cost of purchases
- o Cost of groundwater pumping
- o Cost of Project transportation (but with credits for avoided costs from the Projects)

Assumed prices:

1. Options

\$10/AF for water to be delivered next year. Options must be purchased before October 1.

\$60/AF to call options upstream of the Delta.

\$100/AF to call options in export areas

All options must be called before April 1 or the water reverts to the seller.

The price of options is doubled during dry and critical years. The price of calling options rises by 50% during dry and critical years (when projections are greater than 50% for dry or critical

2. Spot purchases

\$200/AF for the first 200 kaf/yr
\$300/AF for the next 200 kaf/yr
etc.

Add \$100/AF during years projected to be dry and critical with > 50% probability.

3. Water sales by EWA

Price to be negotiated during game.

4. Groundwater pumping costs

Kern/ Gravelly Ford at \$100/AF
Semitropic at \$200/af

5. Demand Shifting

\$100/AF to rent up to \$100 kaf of storage in San Luis from MWD
Intention to shift storage must be declared by June 1
Water must be paid back by January 1 of next year or \$1000/af payment

6. Project Transportation Costs

Still needs work. Should vary by time of year and by the total amount of export pumping. As pumping increases, the marginal cost of electricity will increase. EWA should pay for extra transportation cost, and get credits for reduced transportation costs.

Water Quality Account

Up to \$10 million/yr. This account is money available to a trustee for export water quality to purchase water for salinity reduction in the fall. Account does not accrue.

Water Supply Evaluation

The results from the DWRSIM modeling base plus user water developed at Webb Tract, plus ET gains, plus any efficiency water allocated to the Projects, will roughly represent estimated Project deliveries.

Game Rules

- o EWA has the right to carry debt and to use Project facilities, provided it can assure no harm, unless arrangements for compensation are agreed to in advance. Thus, the EWA may borrow against future water supplies, may shift Project storage from upstream storage to downstream storage, etc., provided that it can make the Project's whole before the water is needed.
- o Unless otherwise specified, EWA has low priority access to Project facilities.
- o Movement of water through the Delta when outflow is controlling has a carriage water cost of 20%. Backing water upstream via export reductions when outflow is controlling reduces carriage water by 20%.

Scenarios run to date

Games for Scenarios 1 and 2 have been run and the detailed evaluations are underway. The credit game 3 scenario was run for two water years and is in the process of being reformulated to make the game more realistic. Game 4 will be run and the evaluations for games 1,2,3,4 will be summarized for the May 13th policy meeting.

Presentation at the May 13th Policy Meeting

At the May 13th meeting the DNCT will summarize the following:

- The essential elements required for an EWA to work
 - Assets
 - Rules
- What has been learned since the last Phase 2 report
- Issues that require Policy decisions for an EWA
- What are the negotiating points
- Guidance to CMARP