

Water Operations Summary: Gaming Exercise  
March 16, 1999 Draft

Scenario #:1B	Description: Project Constraint Approach			Target Year: 4
Possible Water Supply Measures	Used ?	Details	EWA/ Users Division	How to Model How to Game
Interim South Delta Program - 8.5 kcfs	Y	8.5 kcfs	Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
South Delta Program - 10.3 kcfs	N			
JPOD. State/ Federal sublimits remain	N			
JPOD. No individual State/ Federal sublimits	Y	Only overall limits apply	Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
Allow E/I Variances	N			
Eliminate E/I	Y	Eliminate E/I	Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
Eliminate in-Delta AFRP measures for contract	Y		Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
Kern Water Bank	Y	300 kaf storage. 20 kaf/month in. 10 kaf/month out.	Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
Gravelly Ford Groundwater	Y	200 kaf storage? 20 kaf/month in. 10 kaf/month out.	Projects benefit	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)

Possible Water Supply Measures	Used ?	Details	EWA/ Users Division	How to Model How to Game
Shasta Dam Expansion	Y	290 kaf storage	USBR	Model as Project Supply. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
Delta Island Storage	Y	240 kaf storage. 120 kaf *2 islands	Projects benefit	Model as Project Supply. 120 kaf operated as forebay to export intakes. Can be filled from Clifton Court at 2 kcfs using Project rights, plus 2 kcfs when Delta out of balance. Remaining 120 kaf can fill only when Delta out of balance. Suite of water supply enhancement measures are controlled by the Projects. In return, EWA gains certain rights against the Projects (see below)
ET reductions on Delta storage islands	Y	30 kaf/year average	Projects benefit	Add to yield of Projects
EWA rights against Projects	Y		EWA	Coupled to water supply enhancement measures, EWA will receive rights to reduce export pumping. The rights will be expressed in terms of cfs-days. Modeling of Project benefits will be required to provide a basis for a sharing of new supply benefits between the EWA and the Projects. EWA's rights against the Projects might vary by year or could be fixed. For example, the EWA might be granted rights to 200,000 cfs-days against the Projects.
Semitropic high priority storage	Y	200 kaf storage	EWA	Operate by hand in game. This storage is not affiliated with State and Federal Projects and may be a place to store supplemental water market acquisitions by the EWA.
Semitropic low priority storage	N	200 kaf storage		
SOD water purchase options	Y	100 kaf. Usable 3X every 10 years	EWA	Operate by hand in game
NOD water purchase options	Y	100 kaf. Usable every year.	EWA	Operate by hand in game
Spot Purchases	Y	Max of 200 kaf per year. Limited by EWA funds.	EWA	Operate by hand in game
Demand shifting	N	100 kaf. Short term storage lease in San Luis.		

Possible Water Supply Measures	Used ?	Details	EWA/ Users Division	How to Model How to Game
Access Surplus Capacity	Y		EWA	Operate by hand in game
Urban efficiency purchase	Y	15 kaf/yr from 500 ktoilet replacements	EWA	Model as Project Supply. Suite of water supply e controlled by the Projects. In return, EWA gain Projects (see above)

### Initial Conditions

Assume that:

- o All storage is 50% full at the beginning of the game.
- o EWA is funded at the initial level only (e.g., \$20 million)

### EWA Fiscal Budget

All capital costs (e.g., facilities) and recurring costs (e.g., routine option costs) are outside the game. Discretionary expenditures will be dealt with within the game. Discretionary expenditures are: (1) cost of deposits and withdrawals from storage; (2) cost to call options; (3) cost to purchase water on the spot market. Related expenditures such as conveyance cost and power costs will not be dealt with yet. EWA may build up its fiscal reserves by selling or leasing its rights to water or facilities.

Assumed prices:

All purchases	\$100/af
Sales by EWA	\$100/af
Semitropic deposit	?
Semitropic withdrawal	?

EWA budget for purchases: \$20 million initial + \$20 million per year. Unused expenditures may be accumulated for use in later years. (This number was derived using some basic assumptions about costs and the frequency of use for various options. The number is lower than for Scenario 1A because the cost of several actions have been shifted to the Projects).

### Modeling Basis

Modeling will be based upon a combination of pre existing policy, new prescriptive rules from the bio team (no such changes are assumed), elimination of existing prescriptive rules (elimination of E/I and in-Delta AFRP are assumed here), new facilities, new actions, etc. Based upon the matrix above, the modeling upon which the game would be founded would be run with the following assumptions:

- o 1995 Level of Development?
- o Accord + VAMP - E/I
- o Upstream AFRP
- o Trinity
- o Interim South Delta Improvements ( 8.5 kcfs)
- o Unlimited JPOD
- o Kern Water Bank
- o New in-Delta storage
- o Gravelly Ford storage
- o Enlarged Shasta

### Water Supply Evaluation

The results from the modeling basis do not represent actual estimated Project deliveries. Export reductions resulting from the use of EWA rights will reduce average exports. However, in some cases, the Projects will be able to recover some or all export reductions invoked by the EWA by pumping more later in the year. The implication is that Project operator will need to control Project operations in real time during the game to optimize Project exports.

Also, note that supply benefits from ET reductions on Delta island storage islands and efficiency improvements represent an increase of 15 kaf each in average deliveries.

### Game Rules

- o In general, the EWA will not carry debt because its benefits are based upon an annual call (which cannot be carried over from year to year) on Project operations. However, the EWA retains the right to purchase supplemental supplies and may use these supplies as collateral in asking for additional export reductions. The no harm rule applies.
- o For EWA controlled water (as opposed to its rights against the Projects) EWA has low priority access to Project facilities.
- o EWA receives its annual income at the beginning of each water year. EWA may borrow up to one year of future income (e.g., an additional \$30 million) at an interest rate of 8% per year.

### Shifting to Other Target Years

A shift from Target Year 4 to earlier years will result in the loss of Shasta storage, Gravelly Ford storage, and Delta island storage. Additional purchases might be incorporated to compensate, if deemed feasible.

A shift from Target Year 4 to later years might result in the inclusion of the full South Delta Program (10.3 kcfs), additional efficiency and reclamation purchases, additional

groundwater storage projects, and (over time) additional surface storage projects.