

July 21, 1998

**UPDATE ON DWRSIM MODELING ACTIVITIES
FOR CALFED BAY-DELTA PROGRAM
During April - July 1998**

During the last quarter Hydrology and Operations Section has not conducted any new DWRSIM model studies. However, several model enhancements, listed below, have been underway with the assistance from Surface Water Resources Inc. staff.

1. Updating New Melones Interim Operations Plan.
2. Updating ERPP target flows modeling.
3. Modeling of CVPIA (B)(2) AFRP Delta Actions.
4. Development and Incorporation of Artificial Neural Network procedure within DWRSIM to predict Delta outflow requirements to meet salinity standards.

CALFED staff has requested that several DWRSIM studies be re-run with the new version of the model.

1. Modeling of New Melones Operations Plan

1. Due to pulse flow requirements at Vernalis; and corresponding export reductions during 31-day period of April 15-30 and May 16-31, model simulates fourteen periods every year. For output purposes flows are converted to weighted average monthly values.
2. Tuolumne River FERC pulse flows and Stanislaus River Fish and Wildlife pulse flows for 31-day period are timed to match Vernalis pulse flow period.
3. Per the proposed interim New Melones Operation plan, Stanislaus River system is operated dynamically to meet following demands (in order of decreasing priority):
 1. Fish & Wildlife flows below Goodwin Dam
 2. Oakdale Irrigation District and South San Joaquin Irrigation District
 3. Central San Joaquin
 4. Stockton East Demand
 5. Vernalis Water Quality
 6. Stanislaus Dissolved Oxygen Requirements
 7. Vernalis Flow Standards

Note that a maximum flow limit of 1,500 cubic feet per second (cfs) is imposed below Goodwin Dam. This maximum is only exceeded when flood control releases must be made.

2. Modeling of ERPP Flow

1. ERPP target flow requirements are for shorter duration and are superimposed on top of base flows for that period, those base flows are estimated from average monthly flows and may include pulse releases.
2. Additional releases made to meet ERPP target flows may come from:
 - a. Upstream environmental storage, if any,
 - b. "Willing Sellers", the water purchased will result in a direct 1-to-1 reduction in consumptive use.
3. North of Delta storage facility is split into two parts for ERPP modeling purposes, one for environmental use and the other for water supply use. This new storage only stores surplus delta flows. San Joaquin system surface storage is dedicated for environmental use only.
4. Implementation of ERPP requirements will not impact the project operations, additional releases must flow to the ocean. However, the higher Delta outflow will impact delta salinity and position of X2 line.

3. Modeling of CVPIA (B)(2) AFRP Delta Actions

Proposed Delta actions as described in November 20, 1997 USFWS document are being incorporated as discussed below.

Delta Action 1: Vernalis Adaptive Management Plan (VAMP)

- During April 15 - May 15, increase the flow at Vernalis to meet the target flow conditions (2,000, 3,200, 4,450, 5,700, and 7,000 cfs) and set the Delta export accordingly (1,500, 1,500, 1,500, 2,250, and either 1,500 or 3,000 cfs) as described in the July 9th VAMP framework document. For modeling purposes, a San Luis storage (CVP+SWP) target was chosen to achieve export rates of 1,500 cfs and 3,000 cfs at approximately 50/50 distributions for flows above 5,700 cfs.
- Additional water needed to meet the target flows at Vernalis during April 15 - May 15 is provided from the San Joaquin River upstream of its confluence with the Stanislaus River. Additional water requirements are shared between the Tuolumne (New Don Pedro Reservoir) and Merced (Lake McClure) River basins. The additional water is capped at 110 TAF/year.

Delta Action 3: Additional X2 Protection

- Increase X2 requirements at Chipps Island during March through June to the 1962 level of development.

Delta Action 4: Maintain Sacramento River flows at Freeport

- Establish Sacramento River flows at Freeport from 9,000 to 15,000 cfs for 1-week periods over a 30-day period during May by Keswick releases if water is available in Shasta Reservoir.

Delta Action 5: Ramping of the San Joaquin River flow

- The allowable Delta export (Banks+Tracy) to the total Delta inflow ratio (E/I) used in the second half of May consisted of the average of the E/I ratio during the first half of May (pulse period) and the allowable E/I ratio of 0.35 in June.

Delta Action 6: Close Delta Cross Channel gates

- Close Delta Cross Channel gates in October through January in all water year types.

Delta Action 7: July Flows and Exports

- The allowable Delta export in July is determined by applying a ratio to the Delta export in June, depending on the X2 position in June. The ratio is 1.0 if the June X2 is at or east of Collinsville (81km) and would increase linearly to a maximum of 1.86 when the June X2 is at Chipps Island (74 km). When the June X2 is located west of Chipps Island (74 km), no export limit is imposed (beyond existing constraints i.e. 65% E/I ratio) in July.

The following AFRP Delta Actions are not modeled in this study:

- Delta Action 2: Old River Barrier Operation
- Delta Action 8: Evaluate exports and inflows in December-January.

4. Incorporation of ANN Procedure

- Work on this activity has not been completed yet. ANN procedure has been interfaced with DWRSIM; testing of procedure and resulting Delta outflow values are being critically evaluated by Delta modeling staff and others.