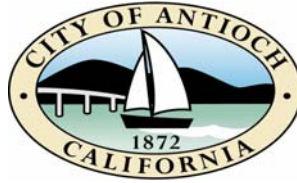


# NORTH DELTA WATER AGENCY



December 10, 2009

Mr. Jerry Johns  
Deputy Director  
California Department of Water Resources  
P.O. Box 942836, Room 1115-9  
Sacramento, CA 94236-0001

**Subject: BDCP Modeling for Modelers Meeting Follow-up**

Dear Jerry:

Thank you for organizing the BDCP Modeling for Modelers meeting on October 28th. We appreciate the effort to address the concerns of our agencies and hope that this will evolve into a closer working relationship to ensure the BDCP modeling tools and documentation meet the needs of the BDCP Steering Committee and stakeholders.

As we discussed at the meeting, we have two primary concerns: (1) the validation of new modeling tools; and (2) the evaluation of effects to Delta water quality and water levels. We recommend the following path to address each of these concerns.

First, the new modeling tools should be validated before model results are relied upon to guide decisions of the BDCP Steering Committee. As technical memos are developed by the project team to support the new modeling tools, the technical memos should be released to the BDCP Steering Committee for review. This level of review is necessary before the Steering Committee can approve any proposed project. We request the release of technical memos detailing the following issues:

- Incorporation of the 2008/09 FWS/NOAA Biological Opinions into the water operations model CALSIM II;
- Calibration and validation of Delta modeling tools to simulate new tidal marsh, including a sensitivity analysis on the placement, size, and timing of tidal marsh construction;
- Transformation of monthly flow output by the operations model to daily flows;
- Training of Artificial Neural Networks (or ANNs) to estimate Delta salinity within the operations model; and
- Other technical memos on the development, calibration, validation, or assumptions of analytical tools.

Second, modeling results should contain sufficient information to validate the new modeling tools and determine the impacts of the BDCP on Delta water quality and water levels. The attached document includes a detailed list of requested output from BDCP operations, hydrodynamic, and water quality modeling that will allow for adequate evaluation.

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Finally, as preliminary modeling runs are now complete (presented to BDCP Steering Committee on December 3, 2009), we request another "BDCP Modeling for Modelers" meeting to discuss the results. Melinda Terry will contact you to coordinate schedules for the next meeting.

Thank you for your attention to these comments. We look forward to continuing a productive dialogue.

Sincerely,



Melinda Terry  
Manager  
North Delta Water Agency



Phil Harrington  
Director of Capital Improvements/Water Rights  
City of Antioch



Greg Gartrell  
Assistant General Manager  
Contra Costa Water District

Cc: BDCP Steering Committee  
Armin Munevar, CH2M HILL

Attachment: Requested Output from BDCP Operations, Hydrodynamic, and  
Water Quality Modeling

## **Requested Output from BDCP Operations, Hydrodynamic, and Water Quality Modeling**

In order for the BDCP Steering Committee and stakeholders to evaluate potential effects of the BDCP, we request the following information from the BDCP modeling effort.

### **Specific Scenarios (CALSIM and DSM2)**

The following scenarios are requested base cases to be used for calibration and validation of the new modeling tools and comparison to the with BDCP project cases.

- Historical Operations in recalibrated Delta model (DSM2 only)
- D1641 operations without BDCP project
- 2008/09 FWS/NMFS BO operations without BDCP project
- 2008/09 FWS/NMFS BO operations, with Delta geometry changes for BDCP Near-term tidal marsh (to determine the effect of near-term marsh alone)
- 2008/09 FWS/NMFS BO operations, with Delta geometry changes for BDCP Long-term tidal marsh (to determine the effect of long-term marsh alone)
- Near-term BDCP proposed operations, except using the D1641 implementation of the X2 standard for February through June, with Delta geometry changes for BDCP Near-term tidal marsh (to determine the effect of five month averaging X2)

### **Specific Output**

The following output is requested from each base case and with project scenario. Many of these outputs are already defined in the Common Assumptions tools. We request the full time series output, not just summarized tables and charts.

- Operations Modeling (CALSIM)
  - End of Month Reservoir Levels
    - Shasta
    - Oroville
    - Folsom
    - San Luis Reservoir
    - New Melones Reservoir
    - Los Vaqueros Reservoir
  - All Delta Inflows - monthly and transformed daily, where appropriate (include diversions and return flows used in DSM2 preprocessing)
    - Sac R near Freeport and Hood (C169, C640)
    - Yolo (C157)
    - Mokelumne and Consumnes Rivers (C504, C501, C503)
    - Calaveras R (C508, R514)
    - San Joaquin R near Vernalis (C639)

## Requested Output from BDCP Operations, Hydrodynamic, and Water Quality Modeling

- All Delta Exports and Diversions - monthly and transformed daily, where appropriate
  - North of Delta exports (D418\_IF, D419\_IF)
  - South of Delta exports (D418\_TD, D419\_TD)
  - Freeport exports and diversions (D168A, D168B, D168B\_EBMUD, D168C)
  - Vallejo diversions (D403A)
  - NBA diversions (D403B, C, D)
  - CCWD diversions (D408\_RS, D408\_OR, D408\_VC, D406A\_MS, D168B\_CCWD)
  - Antioch diversions (D406B)
  - Stockton diversions (D514A, B)
  - Upstream Diversions (North of Delta and east San Joaquin Valley senior water rights diversions)
  - Gross DCU (D404, D410, D413, D412)
- Delta Outflow Information
  - Required Delta Outflow (D407)
  - Net Delta Outflow (C407)
  - Delta Surplus
- Operations Parameters and Criteria
  - X2
  - QWEST
  - Old and Middle River
    - Required
    - Computed
  - Export/Inflow Ratio
  - Delta Cross Channel Operations (transformed to daily)
- Salinity
  - San Joaquin R at Vernalis
  - All ANN locations
- Delta Modeling (DSM2, RMA, UnTRIM, etc)
  - Tidal flow and velocity (15min)
    - At tidal marsh breach locations
    - Upstream and downstream of each new North Delta diversion
    - Old and Middle River compliance locations (channels 106, 144, and 145)
    - City of Antioch

## Requested Output from BDCP Operations, Hydrodynamic, and Water Quality Modeling

- Select locations with relevant historical monitoring data
  - Lower Sacramento
    - Port Chicago (RSAC064)
    - Collinsville (RSAC081)
    - Emmaton (RSAC092)
  - Delta Outflow split
    - Three Mile Slough (SLTHM004)
    - Rio Vista (RSAC101)
    - SJR at Jersey Point (RSAN018)
    - Dutch Slough (SLDUT007)
  - DCC split
    - Sac at Georgiana (RSAC123)
    - Sac above DCC (RSAC128)
    - DCC (CHDCC000)
    - Georgiana Slough (SLGEO019)
  - Steamboat and Sutter Sloughs
    - 3 USGS meter locations (channels 379, 383, and 388)
    - Sac above Sutter Slough
    - Sac below Steamboat Slough
  - Franks Tract
    - False River (channel 279)
    - Old River at SJR (channel 124)
    - Old River at Holland Cut (ROLD041)
    - Old River at Mandeville (channel 119)
  - Central Delta
    - SJR above RRI (RSAN063)
    - Middle River (RMID005, 015)
    - Old River (ROLD024, 034)
  - Suisun Marsh
    - Montezuma Slough (SLMZU003, 011, 025, 032)
- Water level (1hour)
  - At tidal marsh breach locations
  - Upstream and downstream of each new North Delta diversion
  - North Delta
    - Sacramento River
      - Freeport
      - Hood
      - Walnut Grove
      - Rio Vista
      - Collinsville
    - Sutter Slough

## Requested Output from BDCP Operations, Hydrodynamic, and Water Quality Modeling

- Steamboat Slough
- Prospect Slough
- Cache Slough
- Lindsey Slough
- Montezuma Slough
  
- South Delta irrigation level concerns
  - Middle River at Mowery
  - Old River at Tracy
  - San Joaquin River at Brandt Bridge
  
- All barrier locations (upstream and downstream)
  
- All Delta drinking water intakes
  - CCWD Rock Slough, Old River, Victoria Canal, and Mallard Slough Intakes
  - Freeport Regional Water Project
  - North Bay Aqueduct
  - City of Vallejo
  - City of Antioch
  - City of Stockton
  - CCFB Inflow
  - CVP Tracy Pumping Plant
  - New North Delta diversion locations
  
- EC
  - 15-min data
    - City of Antioch
  
  - Daily average
    - All Delta drinking water intakes (see above)
    - Supplemental locations for intakes on dead-end sloughs
      - Old River at Rock Slough (ROLD024)
      - Lindsey Slough at Cache Slough (node 322)
  
    - All D1641 standard locations
  
    - All DWR contract locations (ECCID, NBA, Antioch, Mallard Slough, NDWA)
  
    - All IEP River Kilometer Index (RKI) stations
  
    - Low Salinity Zone (every DSM2 node along specific reach)
      - Sacramento River: Martinez to Rio Vista
      - San Joaquin River: Confluence to Prisoners Point

## Requested Output from BDCP Operations, Hydrodynamic, and Water Quality Modeling

- Volumetric fingerprinting
  - Recommended source fingerprinting locations:
    - Sacramento River at Freeport
    - Yolo Bypass
    - San Joaquin River at Vernalis
    - Martinez
    - Eastside Streams (Mokelumne, Consumnes, and Calaveras)
    - Sacramento Regional WWTP Discharge
    - Stockton WWTP Discharge
    - Other In-Delta WWTPs (to the extent these are distinguishable in DICU)
    - All other in-Delta discharge in DICU
  - Requested output locations
    - Hourly average
      - City of Antioch
    - Daily average
      - All Delta drinking water intakes (see above)
      - Supplemental locations for intakes on dead-end sloughs
        - Old River at Rock Slough (ROLD024)
        - Lindsey Slough at Cache Slough (node 322)
      - All D1641 standard locations
      - All DWR contract locations (ECCID, NBA, Antioch, Mallard Slough, NDWA)
      - Biologically relevant locations