Appendix 5A3 DSM2 Model Assumptions Callouts

1 Introduction

The assumptions for all Sites model simulations are summarized in Appendix 5A1, *Model Assumptions*.

1.1 DSM2 Modeling Assumptions Callouts

The following matrix summarizes the assumptions used for the DSM2 models:

- No Action Alternative 051422
- Alternative 1A 051722
- Alternative 1B 051722
- Alternative 2 051722
- Alternative 3 051722

	No Action Alternative (NAA)	**Alternative 1A (ALT 1A)**	**Alternative 1B (ALT 1B)**	**Alternative 2 (ALT 2)**	**Alternative 3 (ALT 3)**
Period of simulation	82 years (1922-2003)[a]	Same as NAA	Same as NAA	Same as NAA	Same as NAA
BOUNDARY CONDITIONS					
Boundary flows	Monthly timeseries from CALSIM II output (alternatives provide different flows and exports)[b]	Monthly timeseries from CALSIM II output (alternatives provide different flows and exports)[b]	Monthly timeseries from CALSIM II output (alternatives provide different flows and exports)[b]	Monthly timeseries from CALSIM II output (alternatives provide different flows and exports)[b]	Monthly timeseries from CALSIM II output (alternatives provide different flows and exports)[b]
Ag flows (DICU)	2020 Level, DWR Bulletin 160-98[c]	Same as NAA	Same as NAA	Same as NAA	Same as NAA
Martinez stage	15-minute adjusted astronomical tide [a]	Same as NAA	Same as NAA	Same as NAA	Same as NAA

	No Action Alternative (NAA)	**Alternative 1A (ALT 1A)**	**Alternative 1B (ALT 1B)**	**Alternative 2 (ALT 2)**	**Alternative 3 (ALT 3)**
Vernalis EC	Monthly time series from CALSIM II output[d]	Monthly time series from CALSIM II output[d]	Monthly time series from CALSIM II output[d]	Monthly time series from CALSIM II output[d]	Monthly time series from CALSIM II output[d]
Agricultural Return EC	Municipal Water Quality Investigation Program analysis	Same as NAA	Same as NAA	Same as NAA	Same as NAA
Martinez EC	Monthly net Delta Outflow from CALSIM output & G-model[f]	Monthly net Delta Outflow from CALSIM output & G-model[f]	Monthly net Delta Outflow from CALSIM output & G-model[f]	Monthly net Delta Outflow from CALSIM output & G-model[f]	Monthly net Delta Outflow from CALSIM output & G-model[f]
FACILITIES					
Freeport Regional Water Project	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II
Delta Cross Channel	Monthly time series of number of days open from CALSIM II output	Monthly time series of number of days open from CALSIM II output	Monthly time series of number of days open from CALSIM II output	Monthly time series of number of days open from CALSIM II output	Monthly time series of number of days open from CALSIM II output

	No Action Alternative (NAA)	**Alternative 1A (ALT 1A)**	**Alternative 1B (ALT 1B)**	**Alternative 2 (ALT 2)**	**Alternative 3 (ALT 3)**
Stockton Delta Water Supply Project	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II
Barker Slough Pumping Plant	Pumping consistent with SWP contracts and excess flow under Fairfield, Vacaville, and Benicia Settlement Agreement	Same as NAA with increased diversions for Sites deliveries to American Canyon	Same as ALT 1A	Same as ALT 1A	Same as ALT 1A
Franks Tract Program	None	None	None	None	None
Veale Tract Drainage Relocation	The Veale Tract Water Quality Improvement Project, funded by CALFED, relocates the agricultural drainage outlet was relocated from Rock Slough channel to the southern end of Veale Tract, on Indian Slough[f]	Same as NAA	Same as NAA	Same as NAA	Same as NAA
Clifton Court Forebay	Priority 3, gate operations synchronized with incoming tide to minimize impacts to low water levels in nearby channels	Same as NAA	Same as NAA	Same as NAA	Same as NAA

	No Action Alternative (NAA)	Alternative 1A (ALT 1A)	Alternative 1B (ALT 1B)	Alternative 2 (ALT 2)	Alternative 3 (ALT 3)
Contra Costa Water District Delta Intakes	Rock Slough Pumping Plant, Old River at Highway 4 Intake and Alternate Improvement Project Intake on Victoria Canal	Same as NAA	Same as NAA	Same as NAA	Same as NAA
South Delta barriers	Temporary Barriers Project operated based on San Joaquin River flow time series from CALSIM II output; Head of Old River Barrier (HORB) is not installed; Agricultural barriers on Old and Middle Rivers are assumed to be installed starting from May 16 and on Grant Line Canal from June 1; All three barriers are allowed to be operated until November 30; May 16 to May 31; the tidal gates are assumed to be tied open for the barriers on Old and Middle Rivers[i].	Temporary Barriers Project operated based on San Joaquin River flow time series from CALSIM II output; Head of Old River Barrier (HORB) is not installed; Agricultural barriers on Old and Middle Rivers are assumed to be installed starting from May 16 and on Grant Line Canal from June 1; All three barriers are allowed to be operated until November 30; May 16 to May 31; the tidal gates are assumed to be tied open for the barriers on Old and Middle Rivers[i].	Temporary Barriers Project operated based on San Joaquin River flow time series from CALSIM II output; Head of Old River Barrier (HORB) is not installed; Agricultural barriers on Old and Middle Rivers are assumed to be installed starting from May 16 and on Grant Line Canal from June 1; All three barriers are allowed to be operated until November 30; May 16 to May 31; the tidal gates are assumed to be tied open for the barriers on Old and Middle Rivers[i].	Temporary Barriers Project operated based on San Joaquin River flow time series from CALSIM II output; Head of Old River Barrier (HORB) is not installed; Agricultural barriers on Old and Middle Rivers are assumed to be installed starting from May 16 and on Grant Line Canal from June 1; All three barriers are allowed to be operated until November 30; May 16 to May 31; the tidal gates are assumed to be tied open for the barriers on Old and Middle Rivers[i].	Temporary Barriers Project operated based on San Joaquin River flow time series from CALSIM II output; Head of Old River Barrier (HORB) is not installed; Agricultural barriers on Old and Middle Rivers are assumed to be installed starting from May 16 and on Grant Line Canal from June 1; All three barriers are allowed to be operated until November 30; May 16 to May 31; the tidal gates are assumed to be tied open for the barriers on Old and Middle Rivers[i].

	No Action Alternative (NAA)	**Alternative 1A (ALT 1A)**	**Alternative 1B (ALT 1B)**	**Alternative 2 (ALT 2)**	**Alternative 3 (ALT 3)**
Antioch Water Works	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II	Monthly output from CALSIM II
Suisun Marsh Salinity Control Gates	Monthly output from CALSIM II; operate (1) to meet SWRCB D-1641 water quality standards in Montezuma Slough during salinity control season October through May; (2) for the 2019 BiOps Summer/Fall Delta Smelt Habitat Action for up to 60 days in June through October of Below Normal, Above Normal and Wet years; and (3) for the 2020 SWP ITP Delta Smelt Summer/Fall Habitat Action for up to 60 days in June through October of Dry years	Monthly output from CALSIM II; operate (1) to meet SWRCB D-1641 water quality standards in Montezuma Slough during salinity control season October through May; (2) for the 2019 BiOps Summer/Fall Delta Smelt Habitat Action for up to 60 days in June through October of Below Normal, Above Normal and Wet years; and (3) for the 2020 SWP ITP Delta Smelt Summer/Fall Habitat Action for up to 60 days in June through October of Dry years	Monthly output from CALSIM II; operate (1) to meet SWRCB D-1641 water quality standards in Montezuma Slough during salinity control season October through May; (2) for the 2019 BiOps Summer/Fall Delta Smelt Habitat Action for up to 60 days in June through October of Below Normal, Above Normal and Wet years; and (3) for the 2020 SWP ITP Delta Smelt Summer/Fall Habitat Action for up to 60 days in June through October of Dry years	Monthly output from CALSIM II; operate (1) to meet SWRCB D-1641 water quality standards in Montezuma Slough during salinity control season October through May; (2) for the 2019 BiOps Summer/Fall Delta Smelt Habitat Action for up to 60 days in June through October of Below Normal, Above Normal and Wet years; and (3) for the 2020 SWP ITP Delta Smelt Summer/Fall Habitat Action for up to 60 days in June through October of Dry years	Monthly output from CALSIM II; operate (1) to meet SWRCB D-1641 water quality standards in Montezuma Slough during salinity control season October through May; (2) for the 2019 BiOps Summer/Fall Delta Smelt Habitat Action for up to 60 days in June through October of Below Normal, Above Normal and Wet years; and (3) for the 2020 SWP ITP Delta Smelt Summer/Fall Habitat Action for up to 60 days in June through October of Dry years

Notes:

[a] An adjusted astronomical tide for use in DSM2 planning studies has been developed by DWR's Bay Delta Office Modeling Support Branch Delta Modeling Section in cooperation with the Common Assumptions workgroup. This tide is based on a more extensive observed dataset and covers the entire 82-year period of record.

[b] Although monthly CALSIM output was used as the DSM2-HYDRO input, the Sacramento and San Joaquin rivers were interpolated to daily values in order to smooth the transition from high to low and low to high flows. DSM2 then uses the daily flow values along with a 15-minute adjusted astronomical tide to simulate effect of the spring and neap tides.

[c] The Delta Island Consumptive Use (DICU) model is used to calculate diversions and return flows for all Delta islands based on the level of development assumed. The projected 2020 land-use assumptions are found in Bulletin 160-98.

[d] CALSIM II calculates monthly EC for the San Joaquin River, which was then converted to daily EC using the monthly EC and flow for the San Joaquin River. Fixed concentrations of 150, 175, and 125 µmhos/cm were assumed for the Sacramento River, Yolo Bypass, and eastside streams, respectively.

[e] Net Delta outflow based on the CALSIM II flows was used with an updated G-model to calculate Martinez EC. Under changed climate conditions Martinez EC is modified to account for the sea level rise at early (15 cm) and late (45 cm) long-term phases (Year 2060).

[f] Information was obtained based on the information from the draft final "Delta Region Drinking Water Quality Management Plan" dated June 2005 prepared under the CALFED Water Quality Program and a presentation by David Briggs at SWRCB public workshop for periodic review. The presentation "Compliance location at Contra Costa Canal at Pumping Plant #1 – Addressing Local Degradation" notes that the Veale Tract drainage relocation project will be operational in June 2005. The DICU drainage currently simulated at node 204 is moved to node 202 in DSM2.

[g] Based on the FWS Delta Smelt BO Action 5 and the project description provided in the page 119.

[h] Based on the FWS Delta Smelt BO Action 5, Head of Old River Barrier (HORB) is assumed to be not installed in April or May; therefore HORB is only installed in the Fall as shown.