FERC Project 2246 - Yuba River Development Project
Water Balance/Operations Modeling Assumptions

Basics		**Scenario Name:**	Basecase
		Period of Simulation:	10/1/1969-9/30/2010
		New Bullards Bar Reservior Starting Storage (AF):	551,051
		Englebright Reservoir Starting Storage (AF):	30,947
		Starting Agricultural Delivery Deficiency:	0%
Location	Middle Yuba River	**Inflow:**	Historical above Our House Dam
		Accretions:	Synthetic
		Minimum flow below Our House Dam (cfs):	Per FERC 2246 License
		June 16-April 14:	30
		April 15-June 15:	50
		Minimum flow buffer (cfs):	3
		Lohman Ridge Tunnel Capacity (cfs):	860
		Ramping Rate (cfs):	None
	Oregon Creek	**Inflow:**	Historical above Log Cabin Dam
		Accretions:	Synthetic
		Minimum flow below Log Cabin Dam (cfs):	Per FERC 2246 License
		June 16-April 14:	8
		April 15-June 15:	12
		Minimum flow buffer (cfs):	1
		Camptonville Tunnel Capacity (cfs):	1,100
		Ramping Rate (cfs):	None
	New Bullards Bar Reservoir	**Inflow:**	Historical at Goodyears Bar Historical below Slate Creek Diversion Dam
		Accretions:	Synthetic
		New Bullards Bar Reservoir gross pool elevation (ft-msl):	1,956
		New Bullards Bar Reservoir gross pool storage (AF):	966,103
		New Bullards Bar Reservoir minimum pool storage (AF):	Per FERC 2246 License 234,000
		New Bullards Bar Reservior flood reservation (TAF):	Per 1972 USACE Flood Control Manual
		October 31-March 31:	170
		April 30:	100
		May 31-September 15:	0
			Linearly interpolated for intermediate dates
		Flood reservation space buffer (AF):	8,000
		Minimum flow below New Bullards Bar Dam (cfs):	Per FERC 2246 License
		Year-Around:	5 (from Fish Hydro)
		Minimum flow buffer (cfs):	2
		Maximum flow below New Bullards Bar Dam (cfs):	Per 1972 USACE Flood Control Manual 50,000
		Ramping Rate:	None
		Spillway Elevation-Release Capacity:	Maximum Per 1972 USACE Flood Control Manual
		New Bullards Bar Reservoir Target Storage (AF):	
		September 30:	650,000
		October 31:	660,000
		November 30:	660,000
		December 31:	650,000
		January 31:	600,000
		February 28:	650,000
		March 31:	750,000
		April 30:	850,000
		May 31:	940,000
		June 30:	920,000
		July 15:	875,000
		July 31:	825,000
		August 15:	770,000
		August 31:	715,000
			Linearly interpolated for intermediate dates

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	New Bullards Bar Reservoir	**New Bullards Bar Reservoir Target Storage Buffers (Upper/Lower) (AF):**	
		September 30:	20,000 /10,000
		October 31:	20,000 /10,000
		November 30:	30,000 /30,000
		December 31:	30,000 /30,000
		January 31:	80,000 /30,000
		February 28:	30,000 /30,000
		March 31:	30,000 /30,000
		April 30:	30,000 /30,000
		May 31:	26,000 /100,000
		June 30:	0 / 80,000
		July 15:	5,000 /60,000
		July 31:	10,000 /40,000
		August 15:	10,000 /35,000
		August 31:	10,000 /15,000
			Linearly interpolated for intermediate dates
		Reservoir Evaporation (inches):	
		October:	4.31
		November:	1.67
		December:	1.04
		January:	0.93
		February:	1.70
		March:	2.44
		April:	3.21
		May:	4.13
		June:	6.48
		July:	7.78
		August:	7.24
		September:	5.08
		Carryover storage drought protection:	99% exceedance (1 in 100 year)
		Carryover storage delivery protection:	50% of following year
		Minimum shortage for current year for carryover storage:	50%
		Instream flow requirement for following year:	Yuba Accord Schedule 6
		Maximum carryover storage volume (TAF):	440
		Carryover storage buffer (TAF):	45
		Annual evaporation for carryover storage calculation (TAF):	15
	Colgate Powerhouse	**Colgate Powerhouse release capacity (cfs):**	3,430
		Colgate Powerhouse minimum release (cfs):	0
		Colgate Powerhouse turbine elevation (ft-msl):	565
		Maximum Colgate Powerhouse reduction for Englebright Reservoir spill avoidance:	70%
		Colgate Powerhouse flow-head-generation:	Based on empirical data (2002-2009)
		Colgate Powerhouse Generation Factors Applied:	None
		Ramping Rate:	None
	Englebright Reservoir	**Inflow:**	Historical South Yuba River at Jones Bar
		Accretions:	Synthetic
		Englebright Dam crest elevation (ft-msl):	527
		Englebright Reservoir minimum operating elevation (ft-msl):	516
		Englebright Reservoir target operating elevation (ft-msl):	519
		Englebright Reservoir target operating storage (AF):	30,947
		Englebright Reservoir stage-storage curve:	As provided by YCWA 5/10/2012
		Englebright Reservoir stage-spill relationship:	As provided by YCWA 5/10/2012
		Narrows 1 Powerhouse maximum release capacity (cfs):	720
		Narrows 1 Powerhouse minimum release (cfs):	71
		Narrows 2 Powerhouse maximum release capacity (cfs):	3,400
		Narrows 2 Powerhouse minimum release (cfs):	900
		Narrows 1 Powerhouse flow-head-generation relationship:	Developed based on PG&E flow test
		Narrows 2 Powerhouse flow-head-generation relationship:	Based on empirical data (2002-2009)
		Narrows 1 and 2 powerhouses' tailwater elevation (ft-msl):	287

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	Englebright Reservoir	**Elevation trigger for maximum Narrows release (ft-msl):**	523
		Narrows 1 and 2 powerhouses flow split:	Favor use of Narrows 1 powerhouse for "Green Energy Credits"
		Englebright Reservoir water surface area (acres):	810
		Reservoir Evaporation (inches):	
		October:	5.03
		November:	1.95
		December:	1.21
		January:	1.09
		February:	1.99
		March:	2.85
		April:	3.75
		May:	4.83
		June:	7.58
		July:	9.09
		August:	8.46
		September:	5.95
		Number of days forward to look for forecasting freshets (days):	4
	Lower Yuba River	**Inflow:**	Historical Deer Creek near Smartville Synthetic Dry Creek near confluence
		Accretions:	None
		Minimum flow at Smartville Gage:	Per Yuba River Accord
		Smartville Gage Buffer:	None, Accord flow schedules applied on a 5-day average
		Minimum flow at Marysville Gage:	Per Yuba River Accord
		Marysville Gage Buffer:	None, Accord flow schedules applied on a 5-day average
		Maximum flow at Marysville gage:	Per 1972 USACE Flood Control Manual 120,000 cfs
		Daguerre Point Diversion Demand:	Based on 2005 land use and published applied water rates Daily patterns based on 2003-2007 historical deliveries Present Level Demands (291,197 AF wet/ 305,081 AF Dry)
		Groundwater substitution transfers:	None
		Flow Stability Criteria:	Per FERC 2246 License Amendment Only applies to controlled events Maximum reduction to 70% of previous day's flow Maximum reduction to 55% of September 15-October 31 flow Maximum reduction to 65% of November 1-March 31 flow
		Maximum flow above minimum flows for September 1- October 31 (cfs):	300
		Englebright Reservoir inflow defining controlled events (Non-NBB Release) (cfs):	500
		Ramping Rate (cfs):	Maximum daily reduction of 200 cfs
Other Assumptions		**Englebright Spill Avoidance:**	If forecasted inflow to Englebright Reservoir (assumes 4 days of perfect foresight) exceeds Narrows 1 and 2 combined release capacity, reduce Colgate generation to create space in Englebright Reservoir as long as it does not result in New Bullards Bar Reservoir encroaching on its flood reservation.
		New Bullards Bar Reservoir Target Operating Line Operations:	If forecasted storage, with operations for instream flows, would resut in New Bullards Bar Reservoir storage in excess of upper target operating line buffer (but below flood pool), run Colgate powerhouse at maximum capacity, providing it does not spill Engebright Reservoir. If forecasted storage would be below lower target operating line buffer (but above minimum pool), make releases for lower Yuba River flow requirements. Forecasted storage within buffer zone results in releases that are linearly interpolated between the two extremes.
		Instream flow requirements:	Computed assuming perfect foresight for the year. Are in effect for April 1 through March 31
		Low New Bullards Bar Reservoir storage:	If New Bullards Bar reservoir storage reaches the FERC minimum pool, inflows are released up to the instream flow