System Reoperation Study

Overview July 2016

CALFED Surface Storage Investigations



CALFED Surface Storage Investigations

- **Objectives**
 - Water supply reliability
 - Hydropower
 - Ecosystem
 - Water quality
 - Flood protection
 - **Emergency Storage**
 - Recreation

- Designed to improve environmental conditions in addition to mitigating for all project impacts
- Cost allocations based on "Beneficiaries Pay" principle



VICUME 2 - RESOURCE WANAGEMENT STR

Shasta Lake Enlargement

Alternative #4: 18.5-ft Raise

New Storage: 634 TAF

Water Supply:

On Average: 78 TAF/yr

Fish Benefits:

- Cold water pool: 378 TAF
- Increased habitat
- Spawning gravel augmentation

Other Benefits:

- Delta Water Quality
- Hydropower
- Flood Damage Reduction
- Recreation

Estimated Cost: \$1.26 Billion



Shasta Dam & Reservoir Enlargement



North of the Delta Offstream Storage – Sites Reservoir Location

New Storage: 1.2 - 1.8 MAF

Water Supply (M&I + Env): for 1.8 MAF

- Critical & Dry: 526 637 TAF/yr
- On Average: 425 488 TAF/yr

Environmental:

- In-stream Flows
- Cold Water Pool
- Level-4 Refuge
- Delta Water Quality

Other Benefits:

- Hydropower Renewable Integration
- Flood Damage Reduction
- Recreation

Estimated Cost: \$3.2-\$4.1 Billion



Sites Reservoir Features



Upper San Joaquin River Basin Storage at Temperance Flat

New Storage: 1.3 MAF

Water Supply:

- Critical & Dry: 19 121 TAF/yr
- On Average: 61 87 TAF/yr

Environmental:

Enhanced Flow & Temperature to aid San Joaquin River Restoration

Other Benefits:

- Hydropower-Renewable Integration
- Flood Damage Reduction
- Recreation

Estimated Cost: \$2.5 Billion



Temperance Flat and River Profile



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San Joaquin River Mile

Los Vaqueros Expansion

Phase 1 (to 160 TAF)

- New Storage: 60 TAF expansion completed June 2012
- Actual Cost: \$125 Million

Phase 2 (to 275 TAF)

- New Storage: Additional
- 115 TAF would further increase environmental water and emergency dry year water storage
- Estimated Cost: \$800 Million



CALFED Surface Storage Projects - Status

Documents	Shasta Lake Enlargement	NODOS (Sites)	USJRBS (Temp Flat)	Los Vaqueros Expansion
Feasibility Report	Final	Admin	Draft	In progress
Environmental Document	Final EIS	Admin	Draft EIS	EIR/EIS Supp. in progress
Commitments 75% of Non-Public Beneficiaries	0%	50%	0%	Unknown

Not eligible for Prop 1 funding

San Luis Reservoir Expansion Studies



System Reoperation Study





System Reoperation Study Agency Coordination - Vetting

Reservoir Owner and Operators

- U.S.Army Corps of Engineers
- U.S. Bureau of Reclamation
- SWP & CVP Operators
- Metropolitan Water District
- Friant Water Authority
- East Bay Municipal Utility District
- Merced Irrigation District
- Modesto Irrigation District
- Turlock Irrigation District

Fish Agency

National Marine Fisheries Service

Other Stakeholders

- The Nature Conservancy
- California Water Plan Stakeholder groups
- Water Research Foundation

Sacramento Valley

- Glenn-Colusa Irrigation District
- RD 108

Ground Water Districts

- Madera Irrigation District
- Merced Irrigation District
- Modesto Irrigation District
- Turlock Irrigation District
- North San Joaquin Water Conserv. Dist.
- Kern Water Bank Authority
- Arvin-Edison Waters Storage District
- Semitropic-Rosamond Water Bank Authority
- Metropolitan Water District
- Orange Co. Water District
- Water Replenishment District
- Three Valleys Municipal Water District
- Calleguas Municipal Water District
- Raymond Basin Management Board
- San Gabriel Basin Water Qual. Authority
- Inland Empire Utilities Agency



Reoperation Components

Supplemental Ecosystem Flows

GW Conjunctive Management

Forecast Based Operations (FBO)

Water Resources System Integration







Assumed Operations of Reoperation Components

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ecosystem Flows			(W, /	AN, BN Y	(ears)							
Conjunctive Management						(Dry/Criti	ical Year	s)				
FBO												

Shasta + Oroville: Reoperation (Average Annual)

Ecosystem Flows	300 TAF (target)
Conjunctive Mgmt	200 TAF (limit)
FBO (incl. Folsom)	Up to 25% encroachment
	Existing Delta Conv.

	Yield (TAF)
Eco Flows	80
Water Supply	37
Groundwater Pumping	55
Delta Outflow	19

	Change in Carryover Storage (TAF)
Shasta (4.5 MAF)	51
Trinity (2.5 MAF)	-2
Folsom (I MAF)	16
Oroville (3.5 MAF)	-10

CVP/SWP Integrated Operations

- Operation of the CVP/SWP is highly integrated.
- Through expanded Joint Point of Diversion (JPOD) and sharing reservoir release obligations, there is potential of obtaining an additional 100-150 TAF of water supply.



Water Available for Replenishment of Groundwater

Statewide Groundwater Basin Prioritization Summary

Basin	Basin Count	Percent of Total for State			
Ranking	per Rank	GW Use	Overlying Population		
High	43	69%	47%		
Medium	84	27%	41%		
Low	27	3%	1%		
Very Low	361	1%	11%		
Totals	515	100%	100%		

Basin Prioritization results - June 2, 2014





SGM Sustainable Groundwater Management

Questions & Comments





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