Reclamation Feasibility Studies
CALFED Bay-Delta Surface Storage Alternatives

North-of-Delta Offstream Storage

Shasta Enlargement

Los Vaqueros Expansion

Upper San Joaquin River Basin Storage
Shasta Project Purposes

Water Supply + Hydropower + Fish & Wildlife Conservation + Flood Control + Water Quality + Navigation + Recreation Opportunities
Shasta Project Facts & Figures

Dam and Powerhouse

- 523 Feet Dam Height (602 feet above streambed)
- 710 MW Generating Capacity (5 units @ 142 MW)

Reservoir

- 4.5 Million Acre-Feet (MAF) Storage Capacity
- 1.3 MAF Flood Control Space
- 5.7 MAF Mean Annual Runoff
- 29,500 Acres Surface Area @ Full Pool
Study Authority and Background

  Authorized Secretary of Interior to study enlarging Shasta Dam and Reservoir and Sacramento River conveyance

- **1992: Central Valley Project Improvement Act**
  Expanded CVP purposes to protect, restore, enhance fish + wildlife habitats; balance operations + benefits

- **2000: CALFED Bay-Delta Program ROD**
  Specified improving water supply reliability + enlarging cold water pool to maintain lower water temps for fish survival

- **2004: CALFED Bay-Delta Authorization Act**
  Reaffirmed study authority using CALFED ROD as a framework for decisions
Study Areas

- **Primary Area**
  - Shasta Dam & Reservoir area
  - Sacramento River downstream to Red Bluff Diversion Dam

- **Extended Area**
  - Sacramento River basin downstream of Red Bluff Diversion Dam
  - Delta
  - CVP/SWP Service Areas
Planning Objectives

- **Primary**
  - Anadromous Fish Survival
  - Water Supply Reliability

- **Secondary**
  - Ecosystem Restoration
  - Flood Damage Reduction
  - Hydropower
  - Recreation
  - Water Quality
Alternative Plans

- No-Action Alternative
- Water supply reliability + anadromous fish survival
  - CP 1: 6.5 ft dam raise + 256 TAF additional storage
  - CP 2: 12.5 ft dam raise + 443 TAF add’l storage
  - CP 3: 18.5 ft dam raise + 634 TAF add’l storage (CVP Ag)
- Anadromous fish focus + water supply reliability
  - CP 4: 18.5 ft raise + 634 TAF add’l storage; dedicates ~60% of new storage to cold water pool (378 TAF)
  - CP 4A: 18.5 ft raise + 634 TAF add’l storage; dedicates ~30% of new storage to cold water pool of 191 TAF)
- Combination Plan (WSR, AFS, Additional Features)
  - CP 5: 18.5 foot raise + 634 TAF add’l storage + stream eco restoration + rec trails
Common Elements of Alternatives

- **Raise Dam & Increase Reservoir Storage**
  - Modify dam crest, wing dams, spillway and outlets
  - Modify temperature Control Device
  - Modify Hydropower Facilities

- **Reservoir Area Relocations**
  - Recreation Facilities
  - Vehicle & Railway Bridges
  - Road Segments
  - Dikes
  - Structures
  - Utilities

- **Resource Protection & Mitigation**
A raise of 18.5 feet represents a 3 percent increase in the height of Shasta Dam, and corresponds with a 14 percent increase in the storage capacity of Shasta Reservoir.
Pit River Bridge Limits Dam Raises to 18.5 feet.
## Estimated Benefits

<table>
<thead>
<tr>
<th>Objectives &amp; Benefits</th>
<th>Alternatives</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Water Supply Reliability</strong></td>
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<tr>
<td>Increase in Dry &amp; Critical Year deliveries (AF)</td>
<td>47,300 77,800 63,100 47,300 77,800 113,500</td>
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<tr>
<td><strong>Anadromous Fish Survival</strong></td>
<td>61,300 379,200 207,400 812,600 710,000 377,800</td>
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<tr>
<td>Increase fish population (average annual)</td>
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<tr>
<td><strong>Hydropower Generation</strong></td>
<td>54 90 90 133 130 117</td>
<td></td>
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<td></td>
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<tr>
<td>Increase in power (avg annual GWh)</td>
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<tr>
<td><strong>Restore and Enhance Ecosystem Resources</strong></td>
<td>Yes Yes Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Improve Water Quality</strong></td>
<td>Yes Yes Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Maintain and Increase Recreation</strong></td>
<td>85 116 201 307 246 142</td>
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<tr>
<td>Increase in 1000s of user days</td>
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</table>
# Estimated Benefits and Costs

<table>
<thead>
<tr>
<th>Alternatives (in $Million)</th>
<th>CP1</th>
<th>CP2</th>
<th>CP3</th>
<th>CP4</th>
<th>CP4A</th>
<th>CP5</th>
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</thead>
<tbody>
<tr>
<td>Total Construction Cost</td>
<td>$990</td>
<td>$1,089</td>
<td>$1,257</td>
<td>$1,264</td>
<td>$1,265</td>
<td>$1,283</td>
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<tr>
<td>Total Annual Cost</td>
<td>$45.1</td>
<td>$51.2</td>
<td>$53.8</td>
<td>$57.1</td>
<td>$59.0</td>
<td>$61.0</td>
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<tr>
<td>Total Annual Benefits</td>
<td>$29.7</td>
<td>$61.6</td>
<td>$42.6</td>
<td>$86.0</td>
<td>$88.9</td>
<td>$74.2</td>
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<tr>
<td>Net Annual NED Benefit</td>
<td>-$15.4</td>
<td>$10.5</td>
<td>-$11.2</td>
<td>$28.9</td>
<td>$29.9</td>
<td>$13.2</td>
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<tr>
<td>B/C Ratio</td>
<td>0.66</td>
<td>1.20</td>
<td>0.79</td>
<td>1.51</td>
<td>1.51</td>
<td>1.22</td>
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</table>

Based on January 2014 price level
Simulated Reservoir Water Levels

- **Existing Operations**
- **18.5 Foot Raise Operations**

**Storage (1,000 acre-feet)**

- **Minimum Operating Pool**

**Year**

- Jan-72
- Jan-77
- Jan-82
- Jan-87
- Jan-92
Estimated Fishery Benefits from Alternative CP4

- Fall-Run Chinook Salmon
- Late Fall-Run Chinook Salmon
- Spring-Run Chinook Salmon
- Winter-Run Chinook Salmon

Water Year Type:
- Wet
- Above-Normal
- Below-Normal
- Dry
- Critical

Percent Change
Current Efforts

- Completing Planning + Technical Analyses
  - Alternative Plan Refinement and Mitigation
  - Evaluation of Environmental Effects
  - Engineering and Cost Estimating
  - Economic and Financial Analyses

- Documentation
  - Feasibility Report + EIS
  - Supporting Technical Reports

- Stakeholder Outreach
Focus of Final FR & EIS

- Revise documents based on public comments
- Tier to CALFED Programmatic EIS/EIR
- Consider new operational scenario: CP4A
  - Update technical studies
    - Reservoir Tributary Investigations
    - Terrestrial Species Surveys
    - Designs/Cost estimates (Marinas, Pit 7 facilities)
- Refine mitigation & enhancement measures
  - Comprehensive Mitigation Strategy & Plan
- Refine implementation commitments
- Re-evaluate potential effects for Final FR & EIS
- Identify Preferred Alternative (per NEPA) and Recommended Plan (per P&G)
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Key Issues

- CALFED Bay-Delta Program Goals (balanced purposes & benefits; “beneficiaries pay”)
- Potential inundation of property, recreation, resources
- Operations Uncertainty – Delta planning, Biological Opinions,
- McCloud River statute limits State participation
  - Public Resources Code § 5093.542 (CA Wild & Scenic Rivers Act)
  - McCloud River to be maintained in free-flowing condition and protect wild trout fishery
- Native American & Cultural Concerns
- Congress’ authorization needed to construct or not
Next Steps in Feasibility Phase

1. Regional Director’s Pre-Final FR/EIS
2. Commissioner’s Pre-Final FR/EIS
3. Secretary’s Pre-Final FR/EIS to OMB
4. OMB Review + Determination (GO/NO GO)
5. Prepare Final Documents
6. Send Final Documents to Federal Register to Announce 30-day Public Review
7. Secretary’s Recommendations + Documents to Congress for Decision (GO/NO GO)
8. Congressional Authorization + Appropriations (or No Action)
## Schedule

<table>
<thead>
<tr>
<th>Feasibility Study Phase</th>
<th>Pre-Construction Phase</th>
<th>Construction</th>
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<tbody>
<tr>
<td>★ Release Draft EIS for Public Review</td>
<td>Prepare Draft EIS</td>
<td></td>
</tr>
<tr>
<td>Public Review &amp; Comment on DEIS; Prepare Final Reports</td>
<td>OMB Review</td>
<td></td>
</tr>
<tr>
<td>★ Release Final FR &amp; EIS</td>
<td>Secretary’s Recommendations &amp; Final Docs</td>
<td></td>
</tr>
<tr>
<td>★ Release Definite Plan Report</td>
<td>Potential Construction Authorization (Cong)</td>
<td></td>
</tr>
<tr>
<td>Potential Construction Appropriation</td>
<td>Refine Design + Update Costs</td>
<td></td>
</tr>
<tr>
<td>Land Acquisition + Relocations</td>
<td>Construct Project Features</td>
<td>(5 years +)</td>
</tr>
</tbody>
</table>

- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021

**Marc**
For Additional Information

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