



# Achieving Safety and Environmental Success at San Clemente Dam





# San Clemente Dam Seismic and Flood Stability Evaluation

- ◆ Conclusions based on January 1992 report by Woodward-Clyde Consultants to CAL-AM Water
  - Severe overstressing of the dam during a maximum credible earthquake.
  - Foundation erosion due to overtopping during floods.
  - “It is likely that the dam would suffer severe structural damage which could lead to loss of the reservoir.”



# Consequences of Dam Failure

- ◆ Report by Woodward-Clyde Consultants, “Preparation of Dam Failure Inundation Maps for San Clemente Dam”, June 1997.
- ◆ Potential for loss of life for individuals immediately downstream of dam.
- ◆ Peak outflow discharge of 76,700 cubic feet per second (cfs) 5 minutes after dam breach.
- ◆ Camp Stephanie, located 3 miles downstream from the dam, could be flooded 1 to 6 feet.



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# Key Issues

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- ◆ Dam Safety (Earthquake and Flood Loads)
- ◆ Sedimentation
- ◆ Impacts on Fish and Frogs
- ◆ River Degradation
- ◆ Water Supply



# Key Issues

The purposes and objectives for the project under NEPA and CEQA are to:

- ◆ Protect public safety
- ◆ Provide fish passage at the Dam.
- ◆ Maintain a CAW point of diversion on the Carmel River to support existing water supply facilities, water rights and services.
- ◆ Minimize financial impacts to CAW rate payers.





# Sedimentation

- ◆ Dam has acted as a sediment trap since 1921 when construction of the dam was completed.
- ◆ Initial 1500 Acre-Feet storage capacity has been reduced to less than 150 Acre-Feet today.
- ◆ Reservoir is nearly completely full of sediment.



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# Sedimentation

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# Alternatives

## Studied under Joint EIR/EIS

- ◆ No Alternative
- ◆ Dam Strengthening (Buttressing)
- ◆ Dam Notching (to approximately EL. 506 feet)
- ◆ Complete Dam Removal
  - 1 - Remove Sediment, or
  - 2 - Reroute River





# Selected Alternative

Remove the dam and rerouting of the river.

- ◆ Removing the sediment was too costly and environmentally sensitive.
- ◆ Notching the dam, sediment still had to be removed.
- ◆ The buttress is the cheapest, but doesn't deal with the fish passage issue.
- ◆ Reroute although expensive dealt with dam safety issue and fish passage.



# Dam Removal and Carmel River Reroute Project







# Dam Removal and Carmel River Reroute Project





# Selected Alternative

Meets all key issues.

- ◆ Removes the dam safety/public safety hazard.
- ◆ Eliminates cost and environmental risks of sediment removal.
- ◆ Provides fish passage.
- ◆ Upstream diversion will still provide water supply intake.
- ◆ Minimizes financial impacts to CAW rate payers.



# Cost and Schedule

- ◆ Gross estimate of cost - \$80 million.
- ◆ CAW will pay estimate of \$50 million (cost of the strengthening dam alternative).
- ◆ Remain cost developed by agencies (through grants).
- ◆ Projected date for construction 2013 to 2015, but still many hurdles to overcome.
- ◆ Interim Risk Reduction – impoundment effectively drained and early warning system in place.





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# Thank You

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Thanks to David Gutierrez and the California  
Department of Water Resources, Division of  
Safety of Dams