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of Engineers
Sacramento District

SUCCESS DAM
SEISMIC REMEDIATION

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Success Seismic Remediation Project
Introduction

- Overview
  - Seismic Problem at Success Dam
  - Recent Milestones
  - Risk Analysis and Operating Restriction
  - Alternative Selection
  - Current Status
  - Success Spillway Enlargement
  - Challenges

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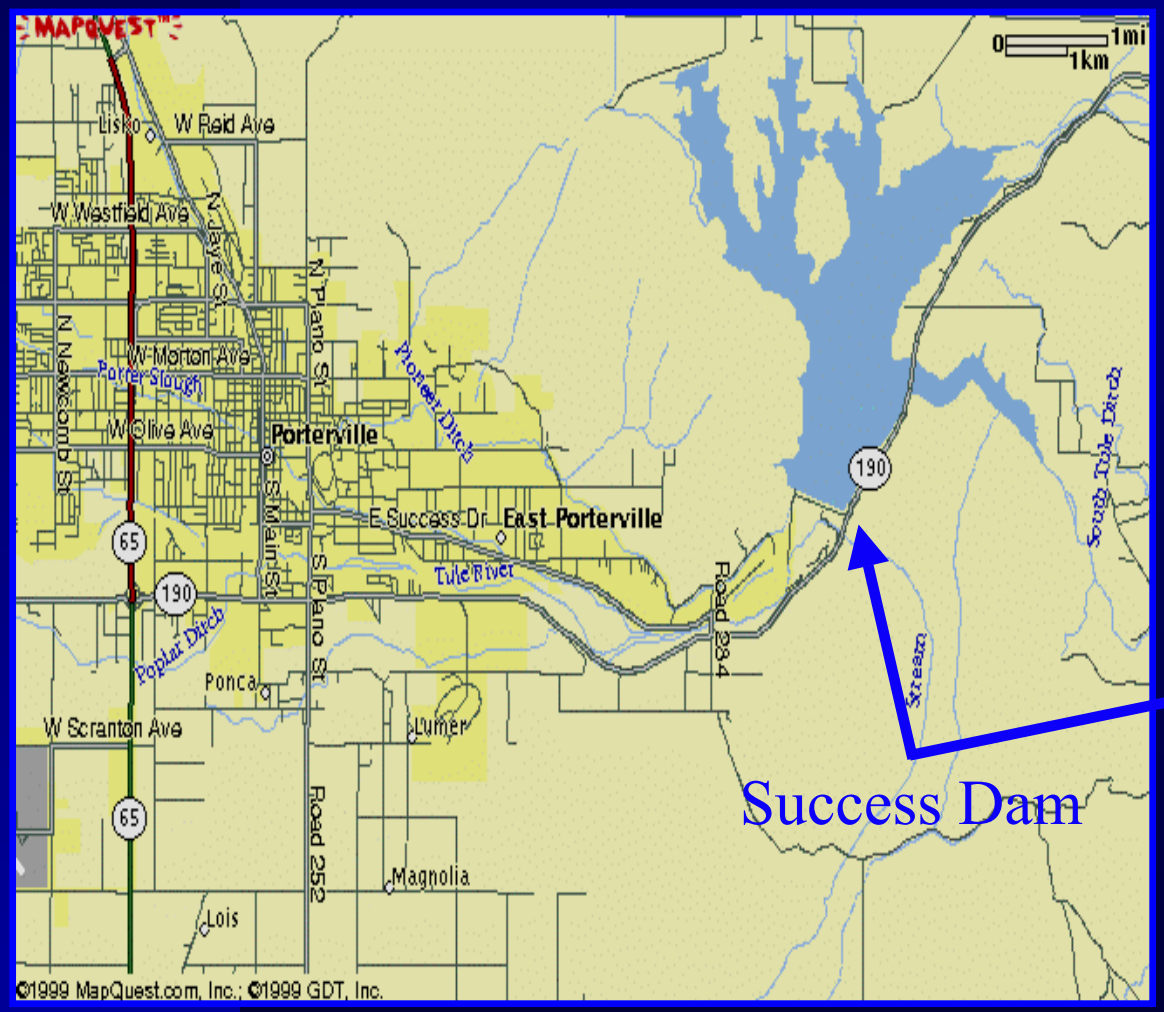
Success Seismic Remediation Project
Location Map



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Success Seismic Remediation Project Key
Key Facts

- Dual Purpose Reservoir – Flood Control & Irrigation
- Completed in 1961
- Original Cost $14.1M
- 185 ft high X 3,450 ft long
- Earth-filled dam
- Storage capacity = 82,300 acre-ft
- Provides 47-year flood protection to the city of Porterville and 200,000 acres downstream

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Primary Earthquake Sources

- Active Faults within 100-mile radius
  - Premier Fault – 13 miles (M 6.75) MCE *
  - San Andreas – 72 miles (M 8.0) OBE **
  - Owens Valley – 52 miles (M 7.6)
  - White Wolf – 57 miles (M7.5)

- *Maximum Credible Earthquake – worst predicted earthquake (max ground acceleration = 0.28g)

- **Operating Basis Earthquake – expected during life of project (max ground acceleration= 0.1g)

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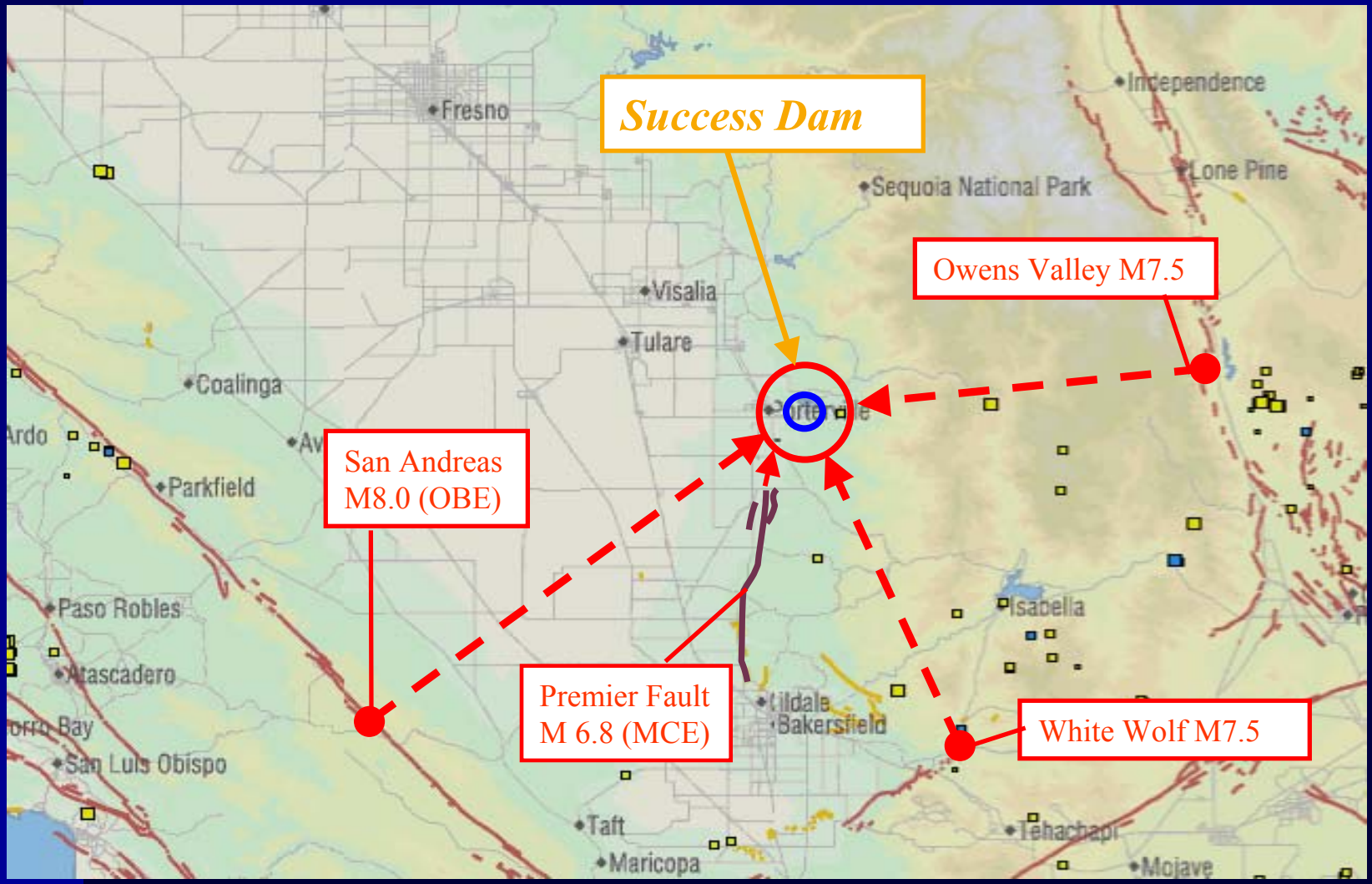
Primary Seismic Sources



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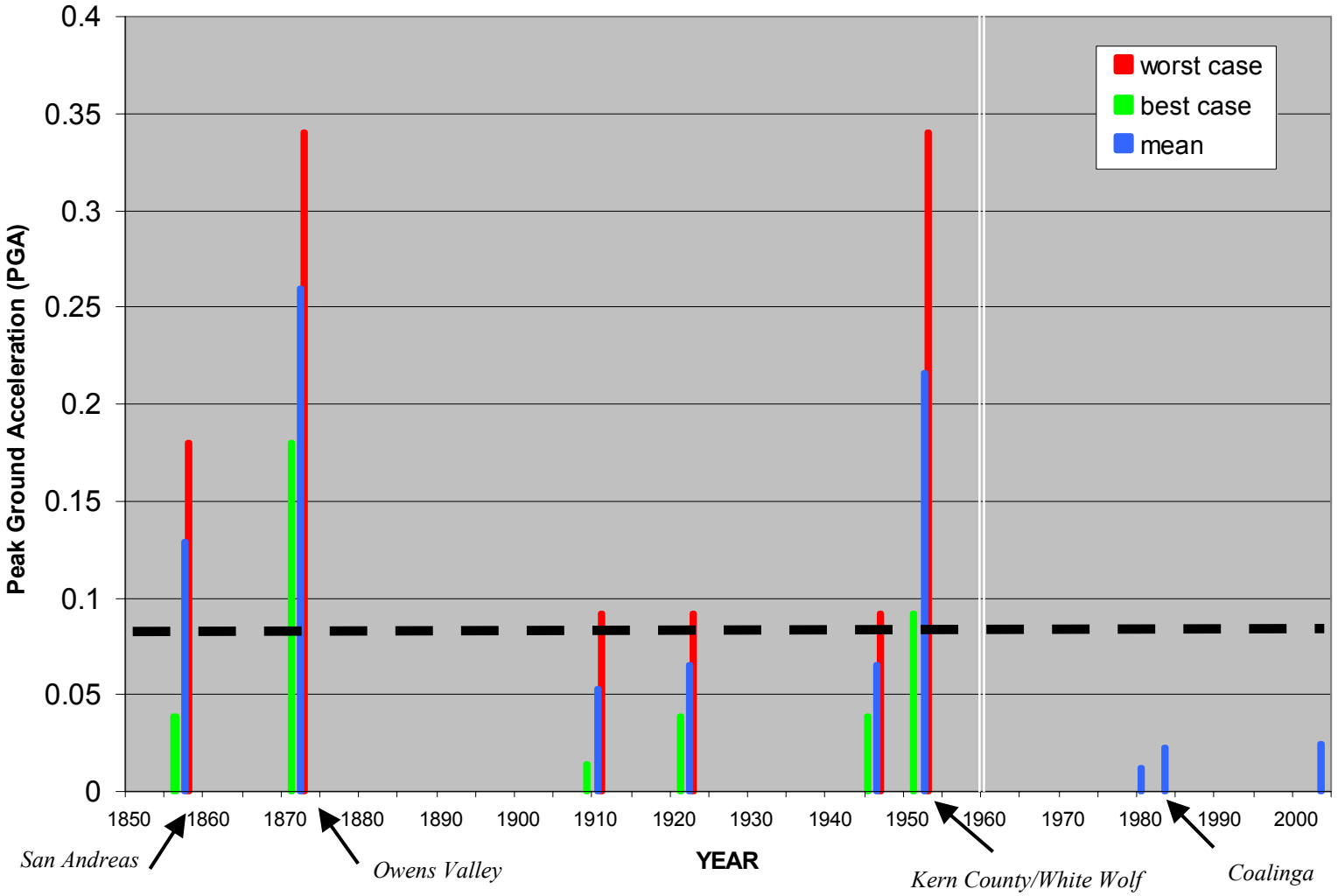
Historic Earthquakes



"0.07g failure threshold"

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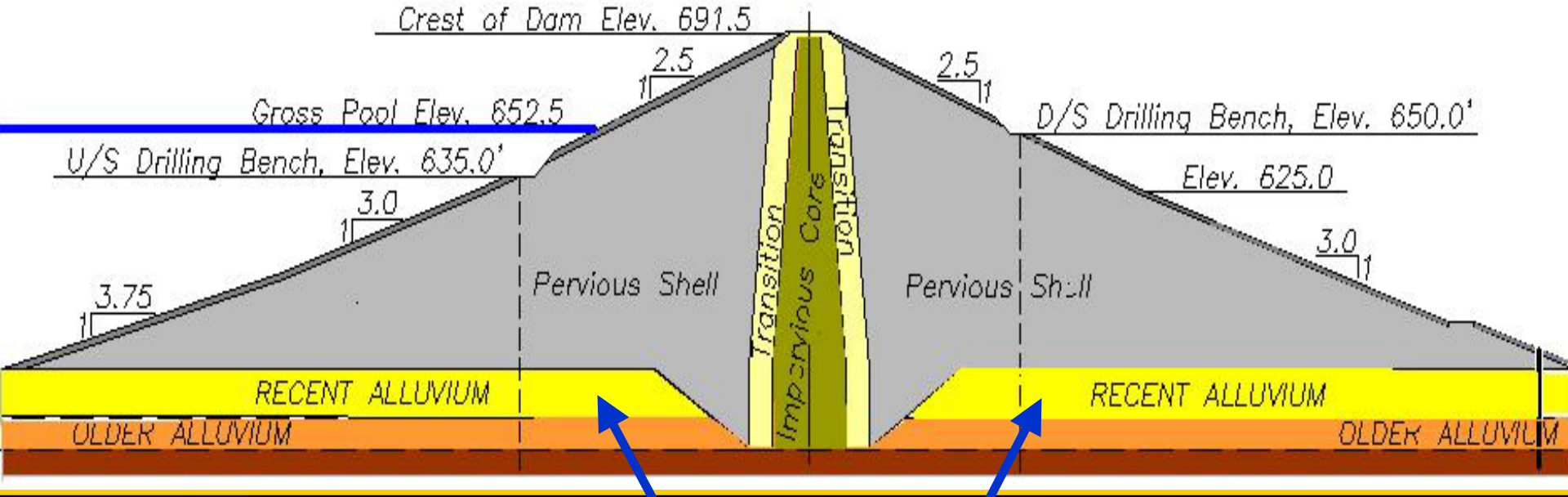
Cross –Section of Dam



Most of the problem materials are the stream deposits known as "Recent Alluvium"

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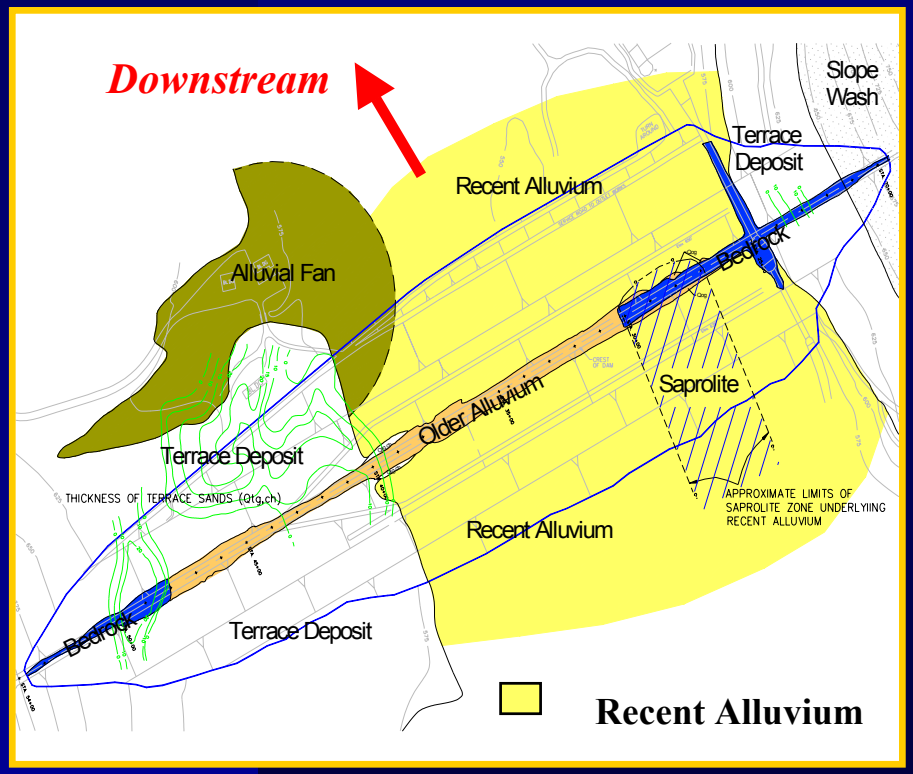
Recent Alluvium



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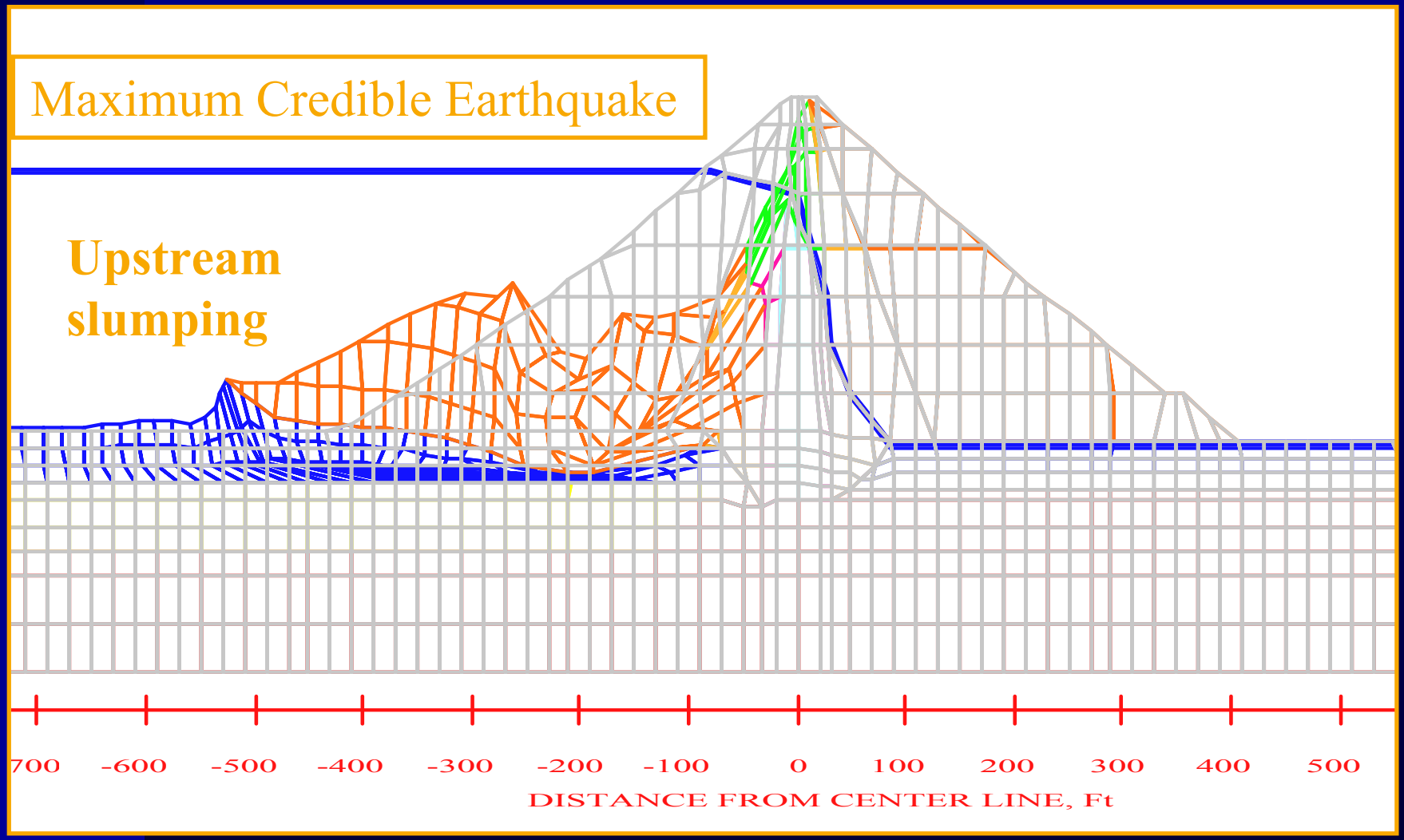
Dam failure at early stages of MCE



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Milestones

- 1999 – Corps completes DSAP Evaluation Report
- 2000 – Construction General Funds appropriated
- 2000-2003 - Further studies and modeling indicate Recent Alluvium will liquefy.
- 2003-2004 - Risk assessment performed
- Sep 2004 – Selection of Roller Compacted Concrete as preferred remediation alternative
- Nov 2004 – CE-SPK Dam Safety Committee recommends temporary operating elevation restriction of 620’ or approximately 1/3 capacity
- Nov 2004 – RCC analysis and studies begin

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Risk Analysis and Operating Restriction

- Risk Analysis Results
  - Risk of uncontrolled release of the reservoir: 1/285 per year. Required 1/10,000
  - Short-term risk reduction: Elevation 620’
    - Eliminates overtopping
    - Reduces seepage failure risk to 1/950
    - Reduces loss of life to within acceptable guidelines
    - May only be in effect for 7 years.
  - Long-term risk reduction requires remediation of dam

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Risk Analysis and Operating Restriction

- Effects of reservoir restriction
  - Loss of Recreation - $2.8M/year (average)
  - Flooding in Tulare Lakebed (wet years = 20%) - $.06M/year (average) - Range $0 - $3.2M
  - Loss of Storage (Agricultural water users) - $1.4M/year (average) - Range $0 - $3.0M

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Alternative Selection

IN-SITU ALTERNATIVE

OVERLAY ALTERNATIVE

ROLLER COMPACTED CONCRETE ALTERNATIVE

NEW EARTHEN EMBANKMENT ALTERNATIVE

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Current Status

- RCC Design and Engineering
  - Foundation exploration -75% complete
  - Structural Analysis - 30% complete
  - Environmental Impact Study (EIS) started
  - Quarry Sites – initial testing begun
  - Tower and Conduit analysis started
  - Real Estate Plan started

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Success Seismic Remediation Project Ongoing and Future Contracts

- Sonic drilling for continuous core sample
- 100’ Shaft design and construction
- Concrete coring of inlet tower for seismic analysis
- Initial excavation of quarry site – 200 ton
- Geophysics testing to profile foundation
- Shear wave testing
- Panel of consultants review of RCC decision
- Rock screening and crushing
- Sample existing embankment for materials

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Success Seismic Remediation Project
Spillway Enlargement Project

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Success Seismic Remediation Project
Spillway Enlargement Project

- PCA signed June 2003
- Non-Federal Sponsors
  - Lower Tule River Irrigation District
  - The Reclamation Board, State of CA
- Estimated cost $28M
- Dual Purpose Project
  - Increase Flood Control from 1:47 to 1:100
  - Increase storage capacity by 29,000 ac-ft
- Work stopped pending further progress on seismic remediation of Success Dam

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Challenges

- Roller Compacted Concrete Dam
  - Foundation materials inconsistent
  - Cement availability and price stability
- Real Estate Acquisition
  - Real Estate Plan dependent upon EIS
  - Costs of mobile home park relocations
  - Purchase 40-acre parcel before EIS
- Funding
  - Large FY07 and FY08 funding requirements

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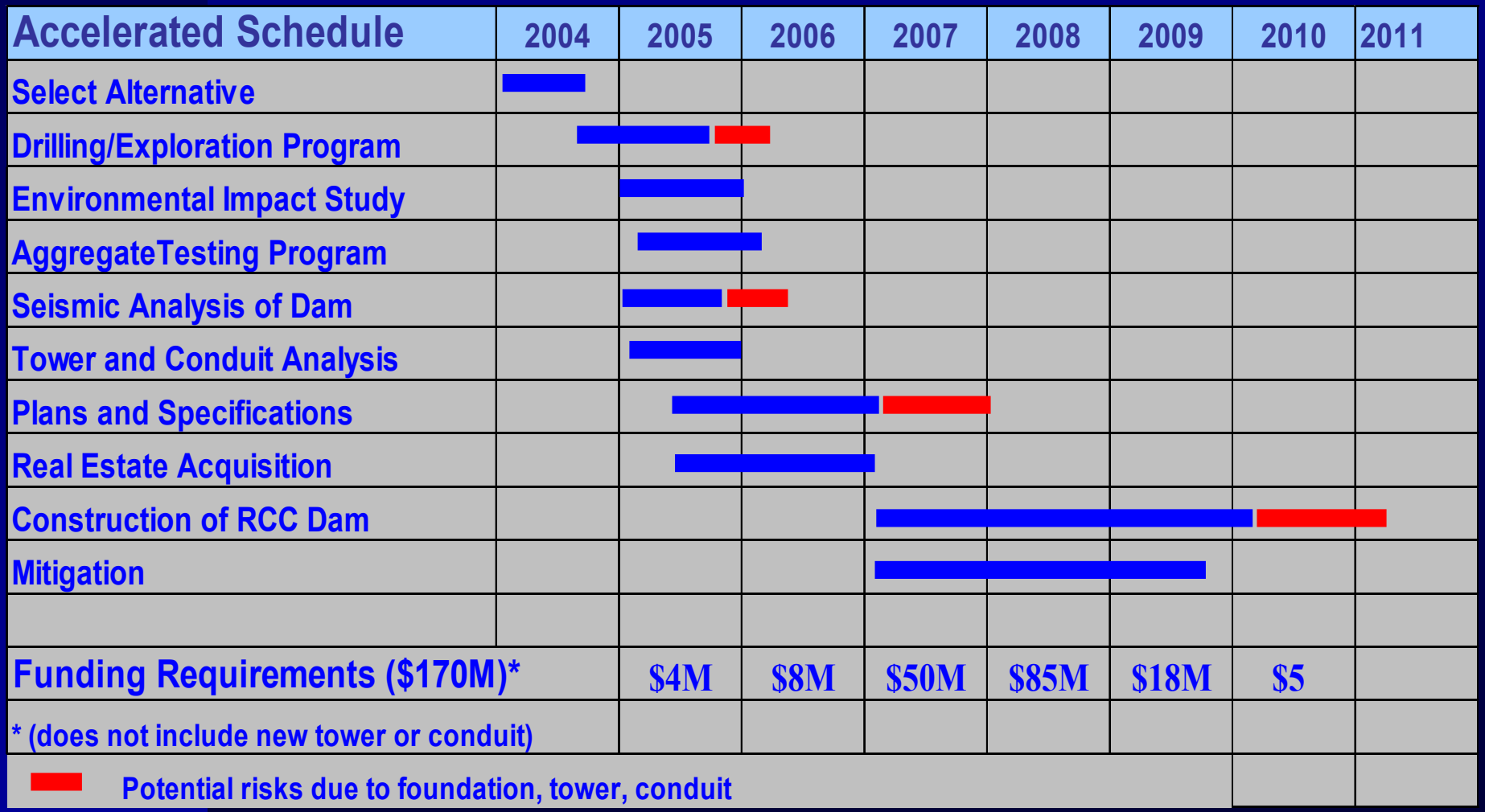
Accelerated Schedule for RCC



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Questions