



Anderson Dam Seismic Retrofit Project Update

Public Meeting – City of Morgan Hill | March 22, 2017

Santa Clara Valley Water District serves...

2 million people

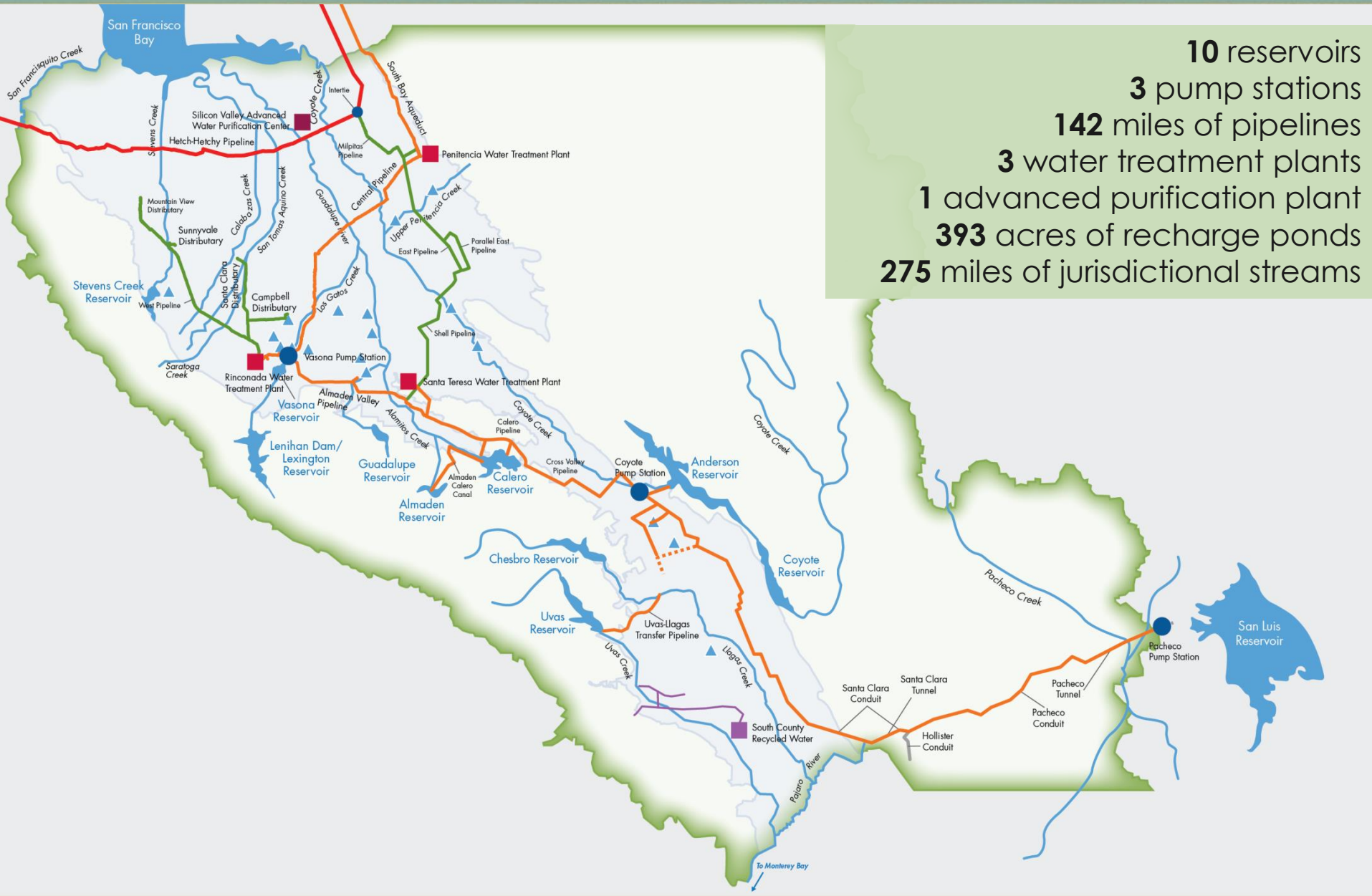
15 cities

4,700 well owners

13 water retailers



Water Supply from Imported Sources and Local Reservoirs Intricately Connected in County



10 reservoirs
3 pump stations
142 miles of pipelines
3 water treatment plants
1 advanced purification plant
393 acres of recharge ponds
275 miles of jurisdictional streams

Anderson Dam: Key to County Water Supply



Anderson: 90,000 Acre-Feet

Total Countywide Storage: 169,000 Acre-Feet



Almaden

Calero



Chesbro



Coyote



Guadalupe



Lexington



Stevens
Creek

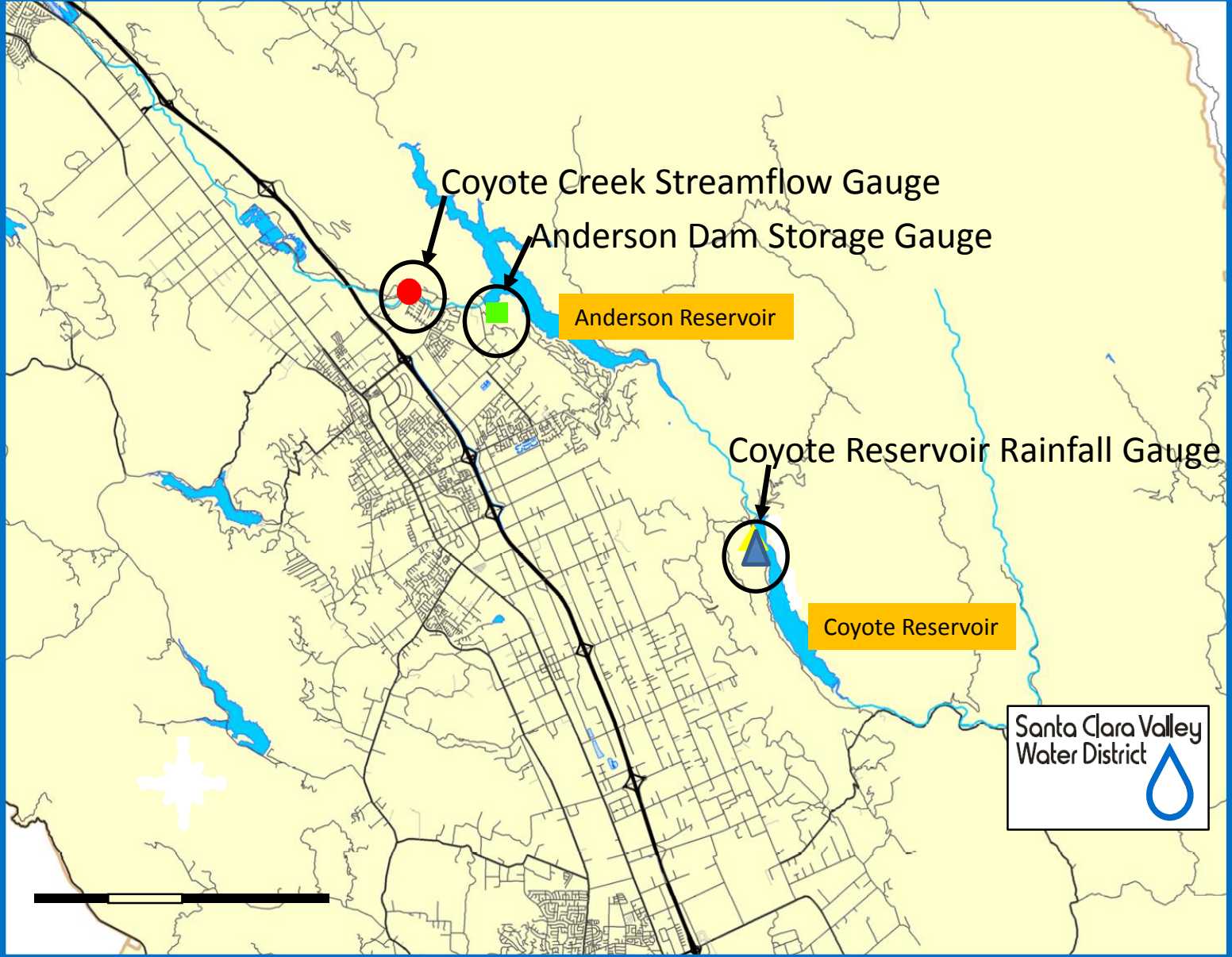


Uvas



Vasona

Map of Gauge Locations in Coyote Watershed



Santa Clara Valley
Water District

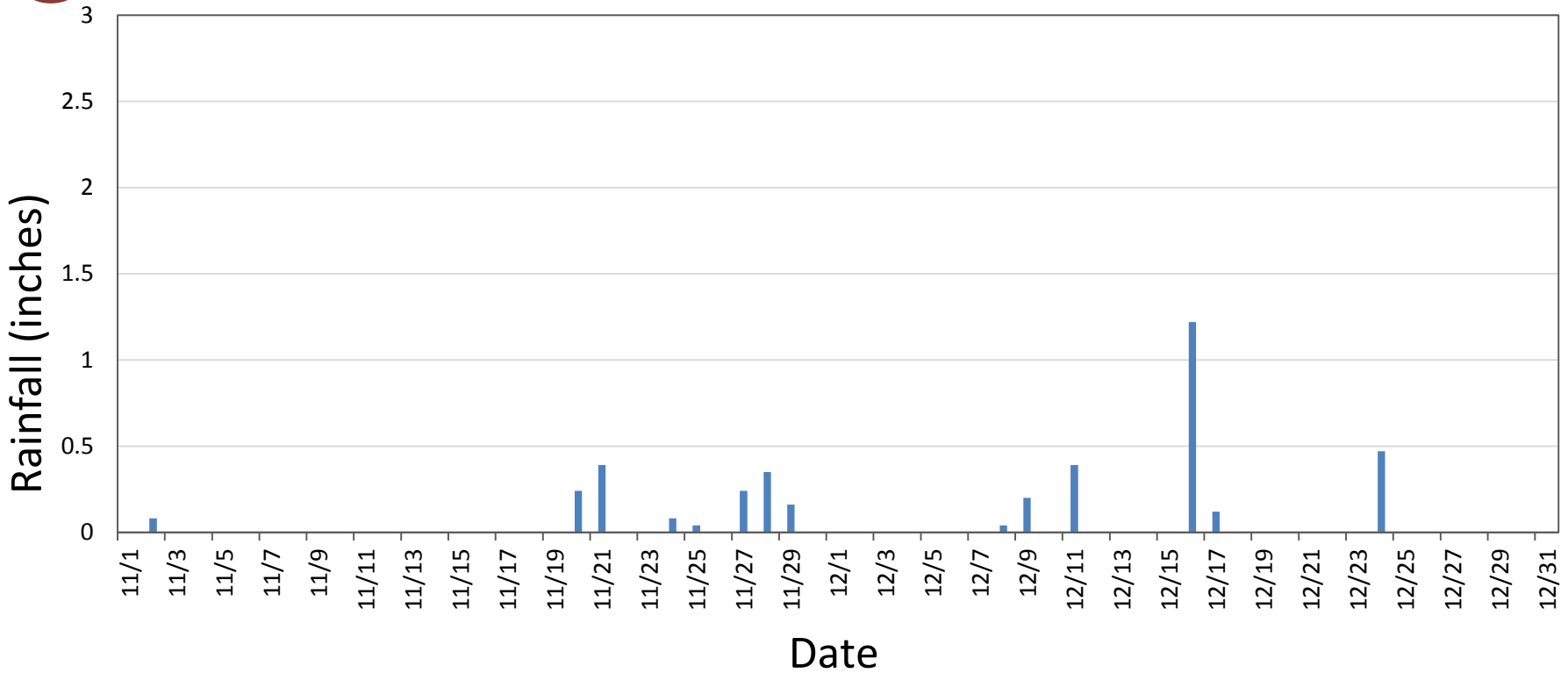


Santa Clara Valley
Water District



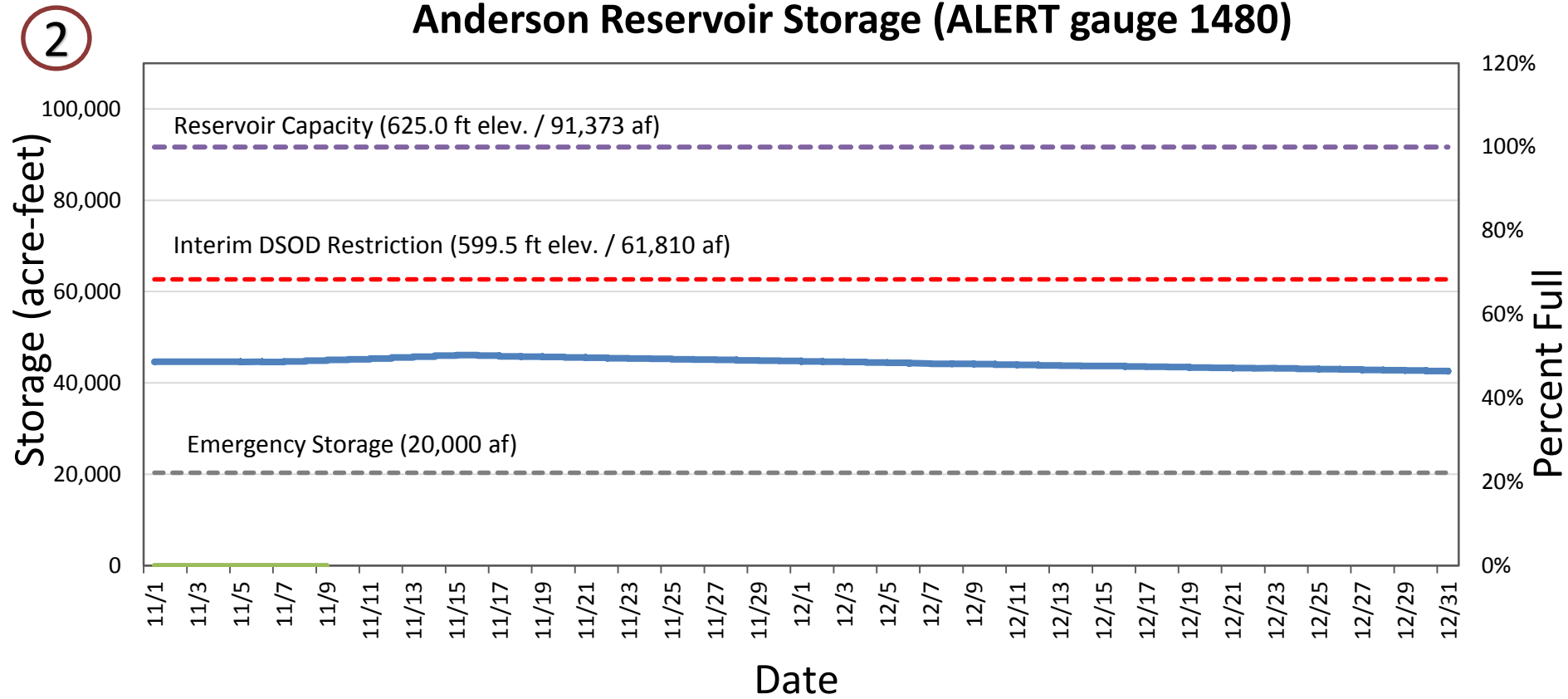
Coyote Reservoir Rainfall: November 1 – December 30, 2016

1 Coyote Reservoir Precipitation Gauge (ALERT gauge 6021)



Anderson Reservoir Storage: Nov. 1 – Dec. 30, 2016

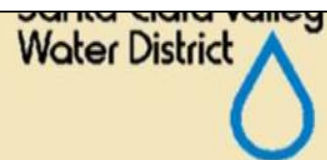
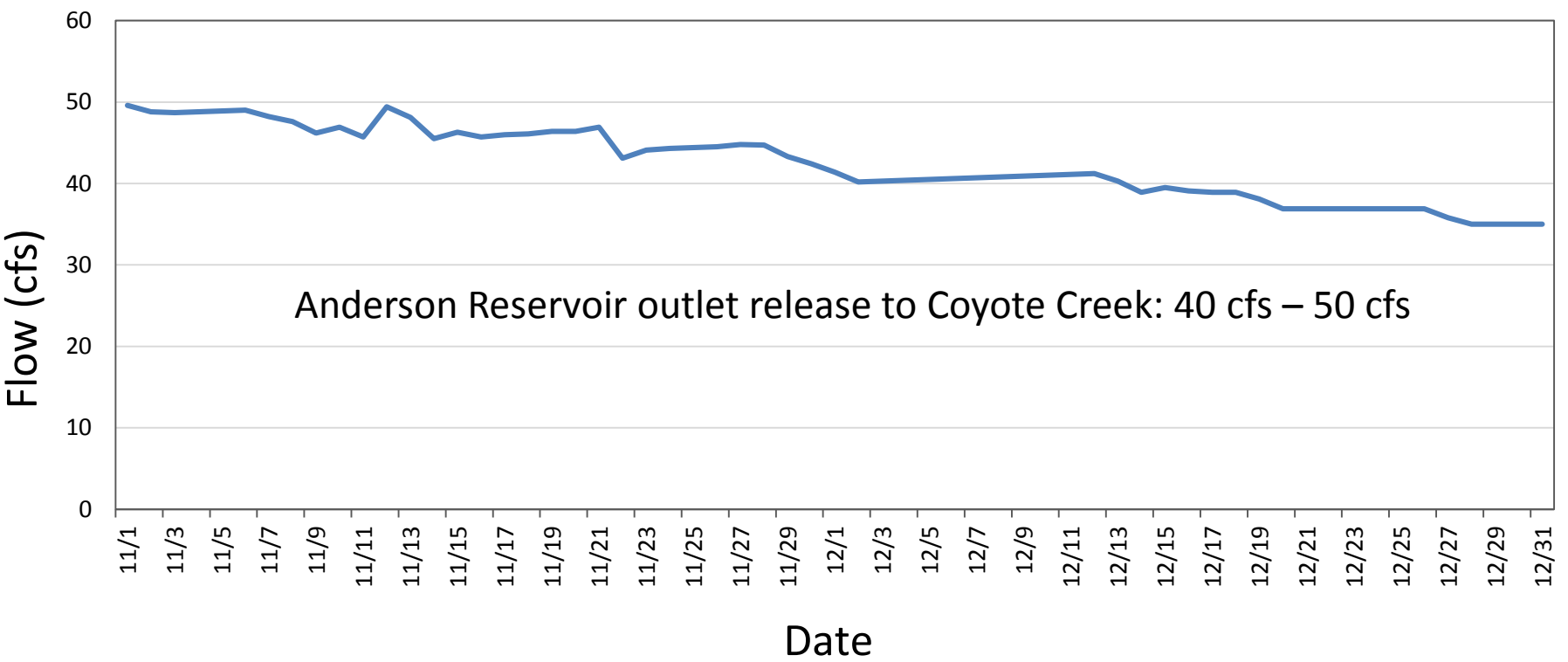
Note: Anderson Reservoir Actual Storage Level is **solid blue line**



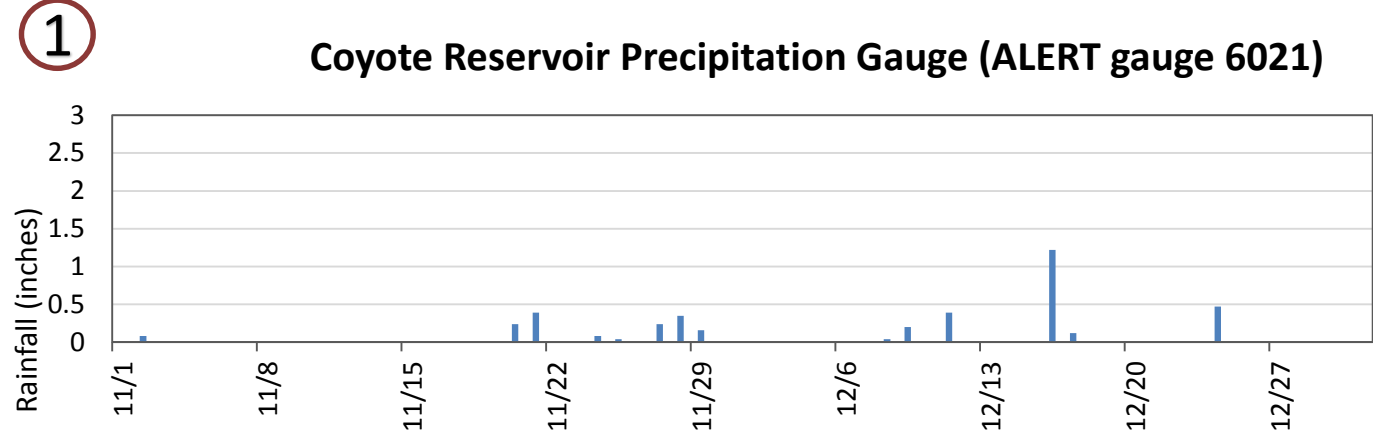
Coyote Creek Flows: November 1 – December 30, 2016

3

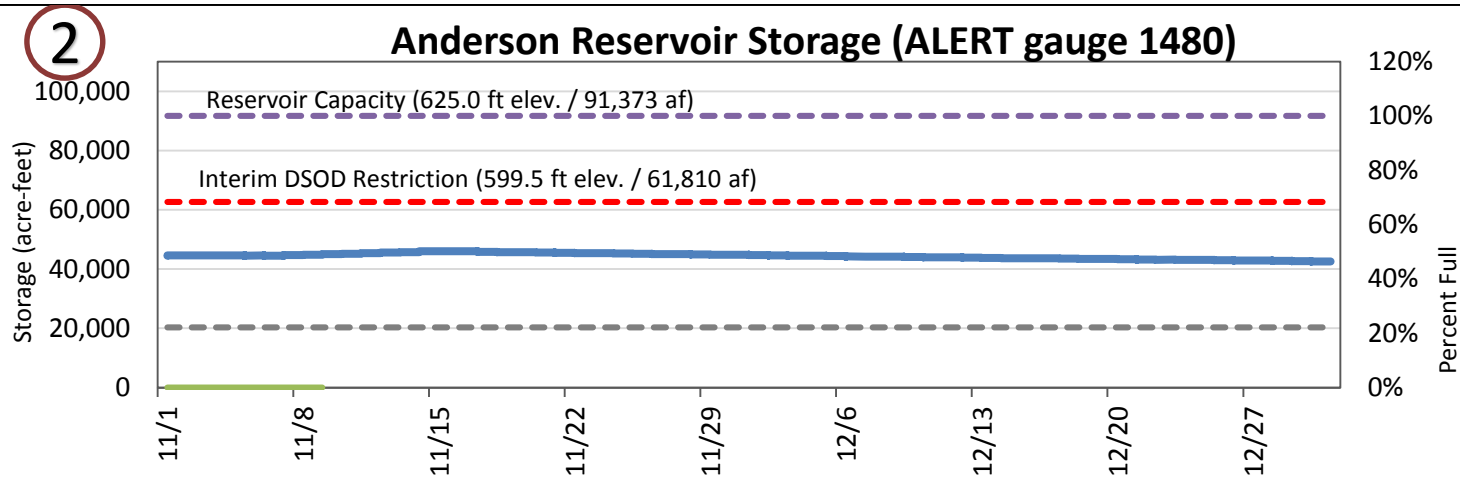
Coyote Creek at Madrone Streamflow Gauge (ALERT gauge 5082)



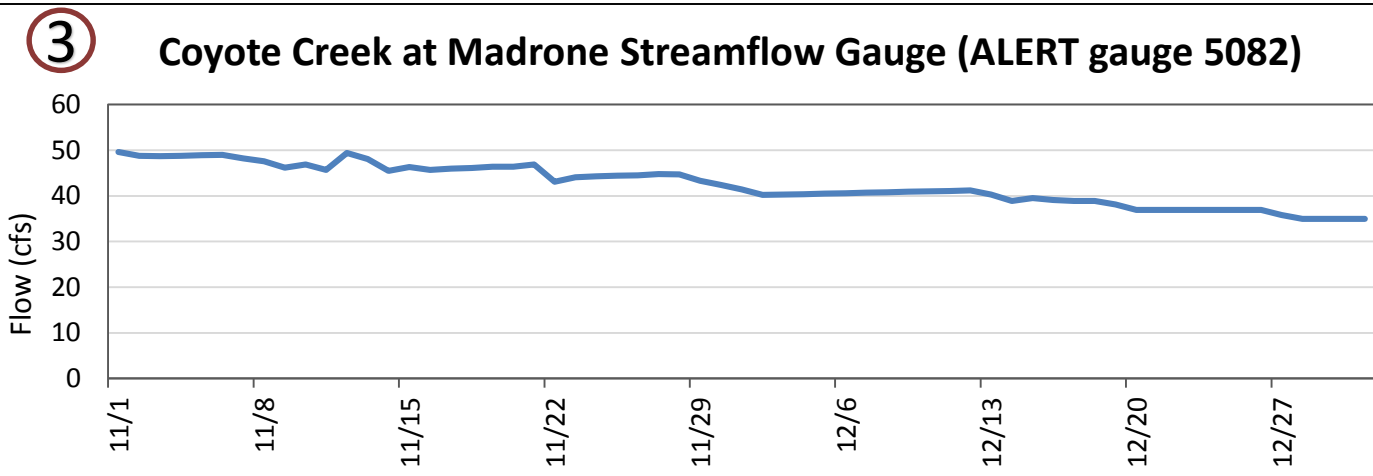
Rainfall



Anderson Dam Storage Levels (blue line)



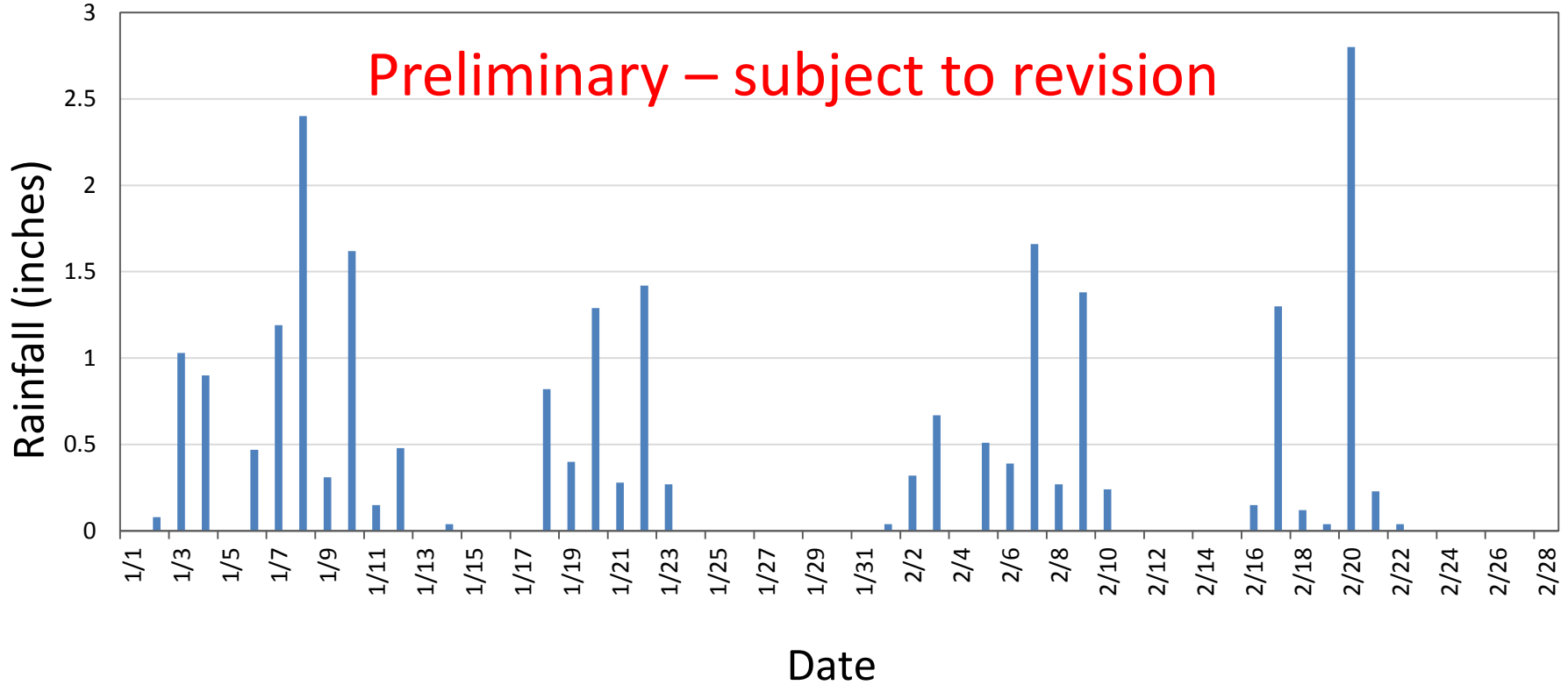
Coyote Creek Flows Downstream of Anderson Dam



Coyote Reservoir Rainfall: January 1 – February 28, 2017

4

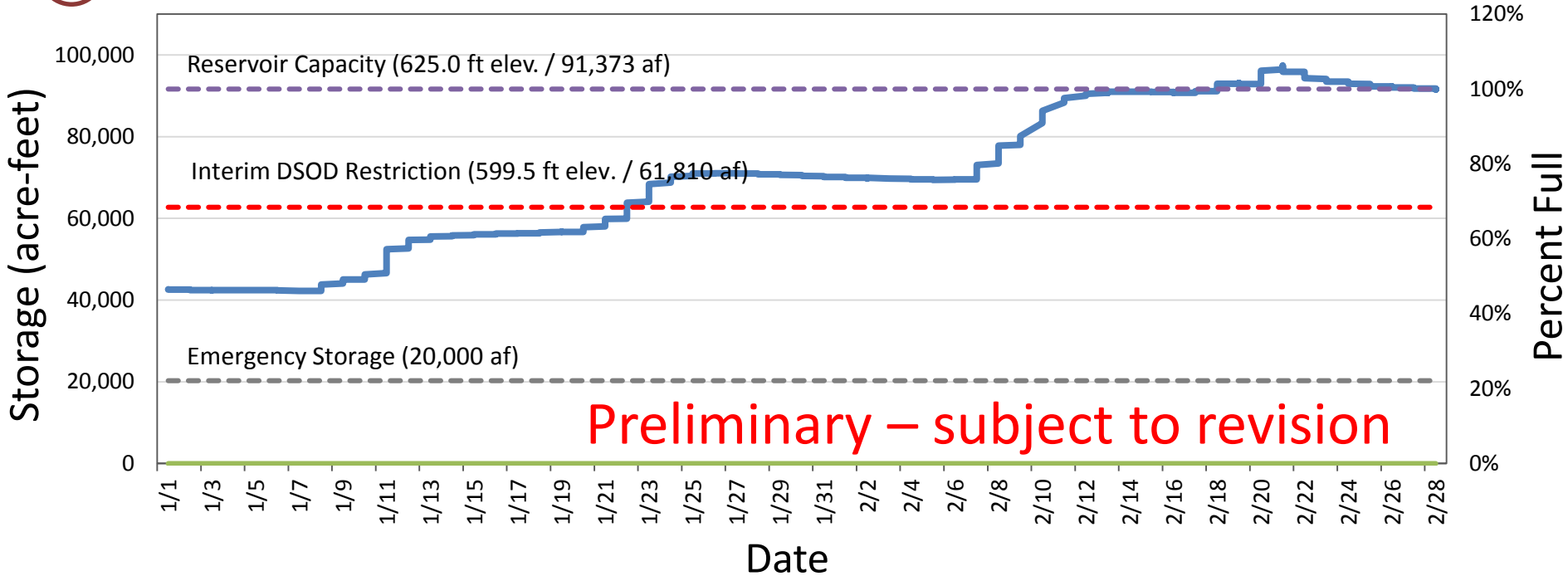
Coyote Reservoir Precipitation Gauge (ALERT gauge 6021)



Anderson Reservoir Storage: Jan. 1 – Feb. 28, 2017

Note: Anderson Reservoir Actual Storage Level is **solid blue line**

5 Anderson Reservoir Storage (ALERT gauge 1480)

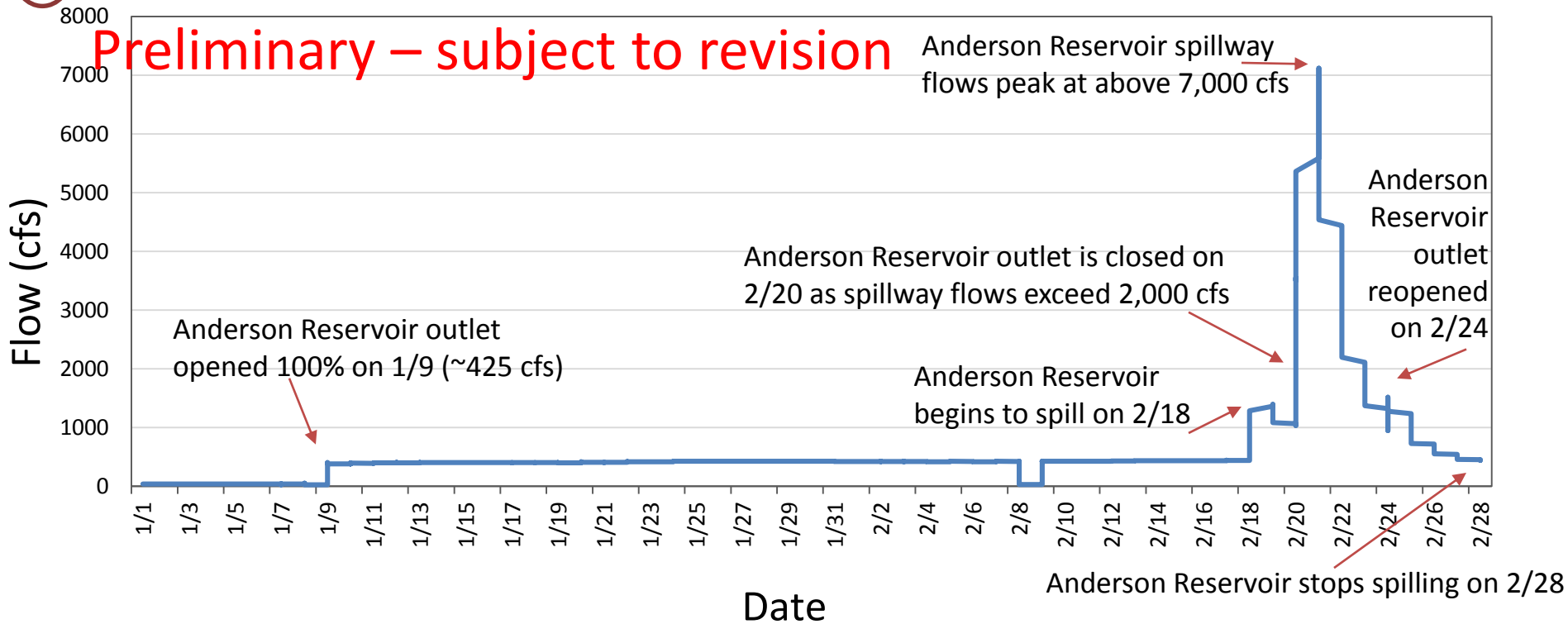


Coyote Creek Flows: January 1 – February 28, 2017

6

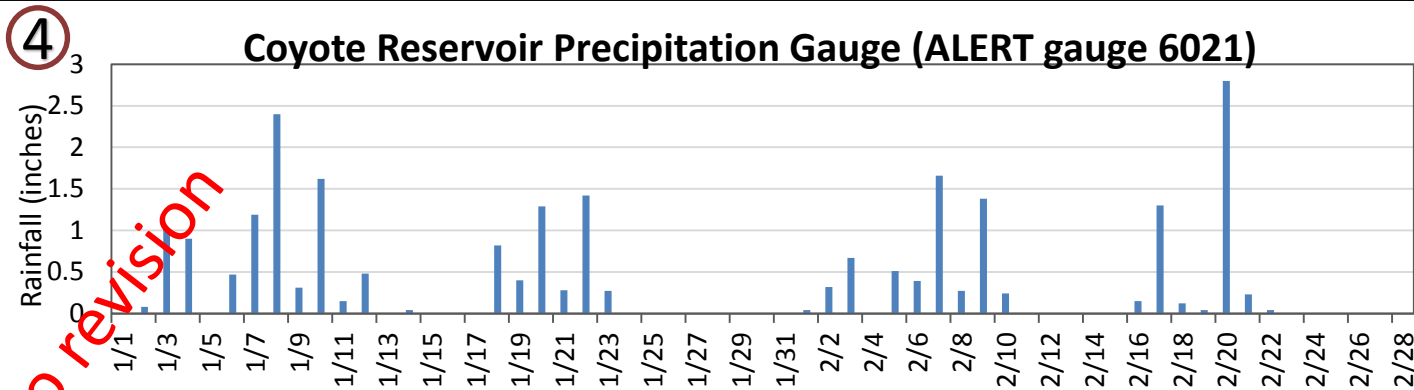
Coyote Creek at Madrone Streamflow Gauge (ALERT gauge 5082)

Preliminary – subject to revision

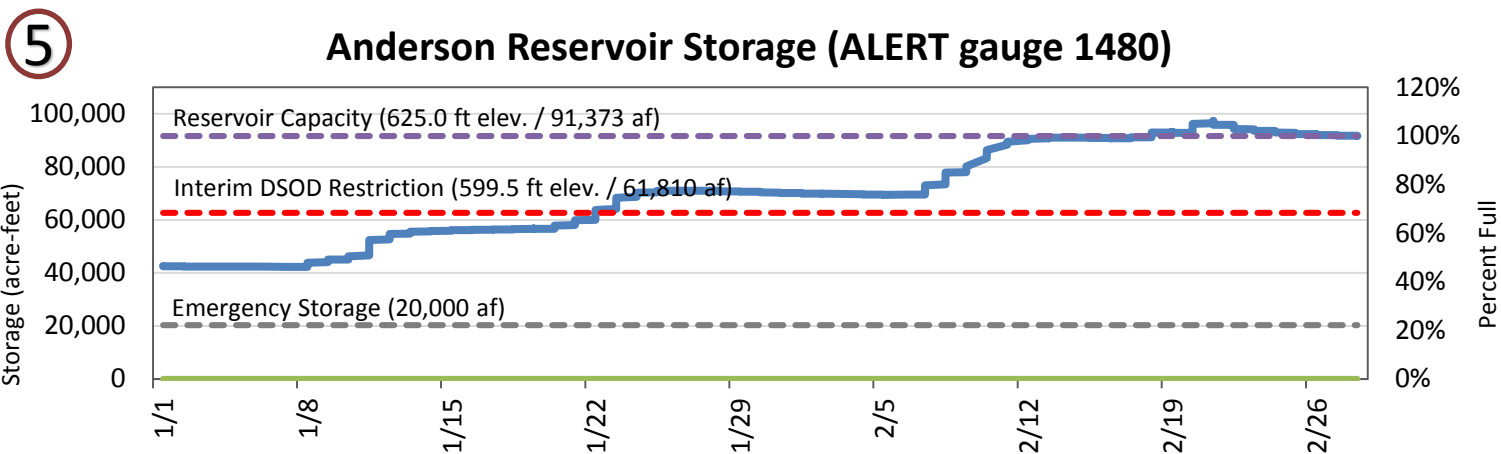


Jan 1 to Feb 28, 2017

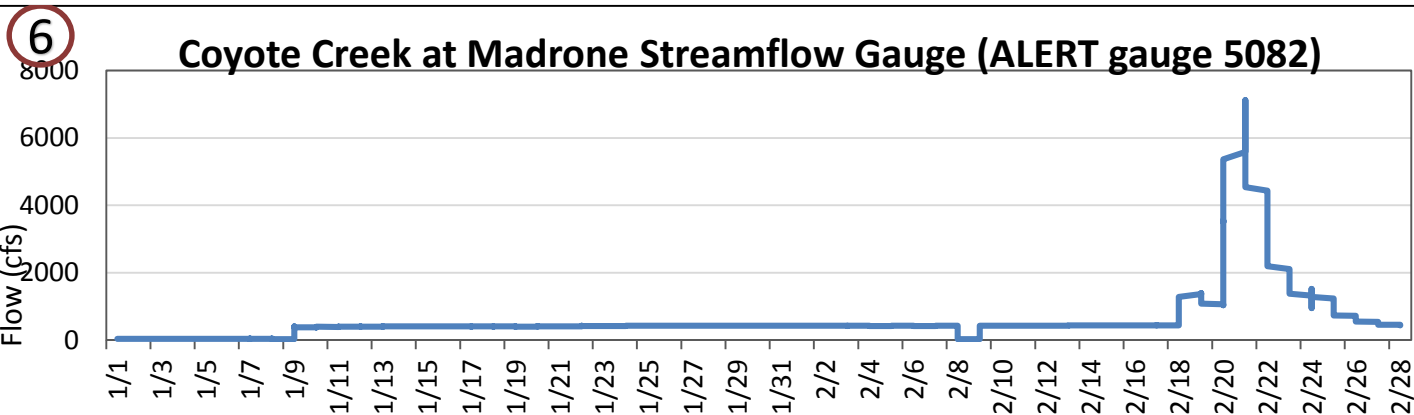
Rainfall



Anderson Dam Storage Levels (blue line)



Coyote Creek Flows Downstream of Anderson Dam



Preliminary - subject to revision



Anderson Dam Operations – Spring 2017

Estimate of timelines to draw down Anderson Reservoir to restricted level (presented to Morgan Hill City Council on March 15, 2017):

Weather Outlook	Approx. No. of days Anderson storage is projected to remain above DSOD restriction	Approximate date storage falls below DSOD restriction
Wetter Spring	55 - 65	Early May 2017
Average Spring	35 – 45	Mid-April 2017
Drier Spring	30 – 40	Early April 2017

Summary

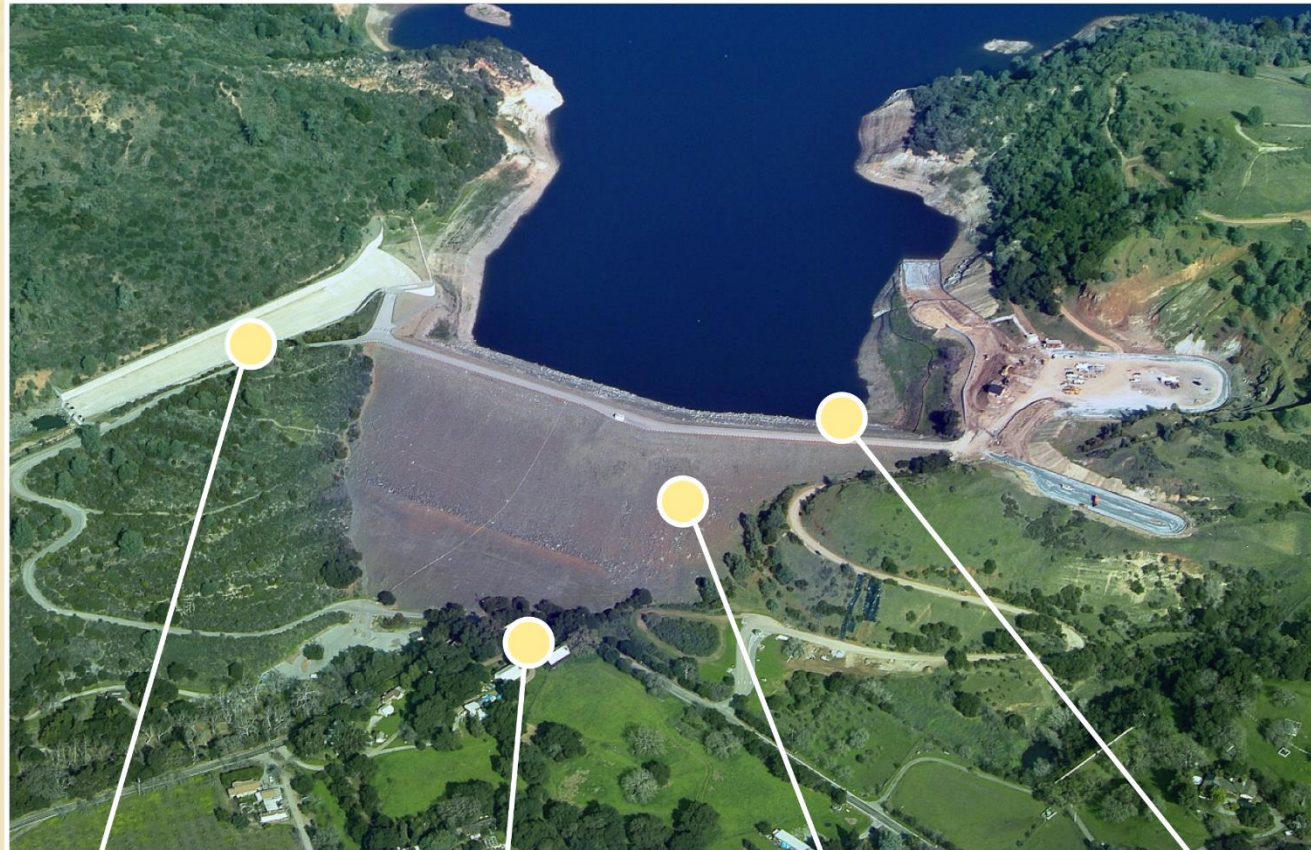
- Water District fully opened Anderson outlet valve on January 9, 2017.
- Water District continued releasing maximum discharge from Anderson Reservoir until February 20, 2017.
- Outlet valve was fully re-opened on February 24.
- As of March 15th, Anderson Reservoir is 90% full. It may take an estimated 30 – 65 days to return to restricted level.

Meeting Purpose

- ▶ **Objectives**
 - ▶ **Provide the latest information on the seismic findings and a modified project approach, an update on project status and schedule, and topics related to dam safety performance**
 - ▶ **Address community questions and concerns**
 - ▶ **Reinforce our commitment to public safety and keeping the community informed as the project progresses**
- ▶ **Questions & Answers**
- ▶ **Informational Booths**

Background and Project Overview

Anderson Dam Existing Configuration



Spillway

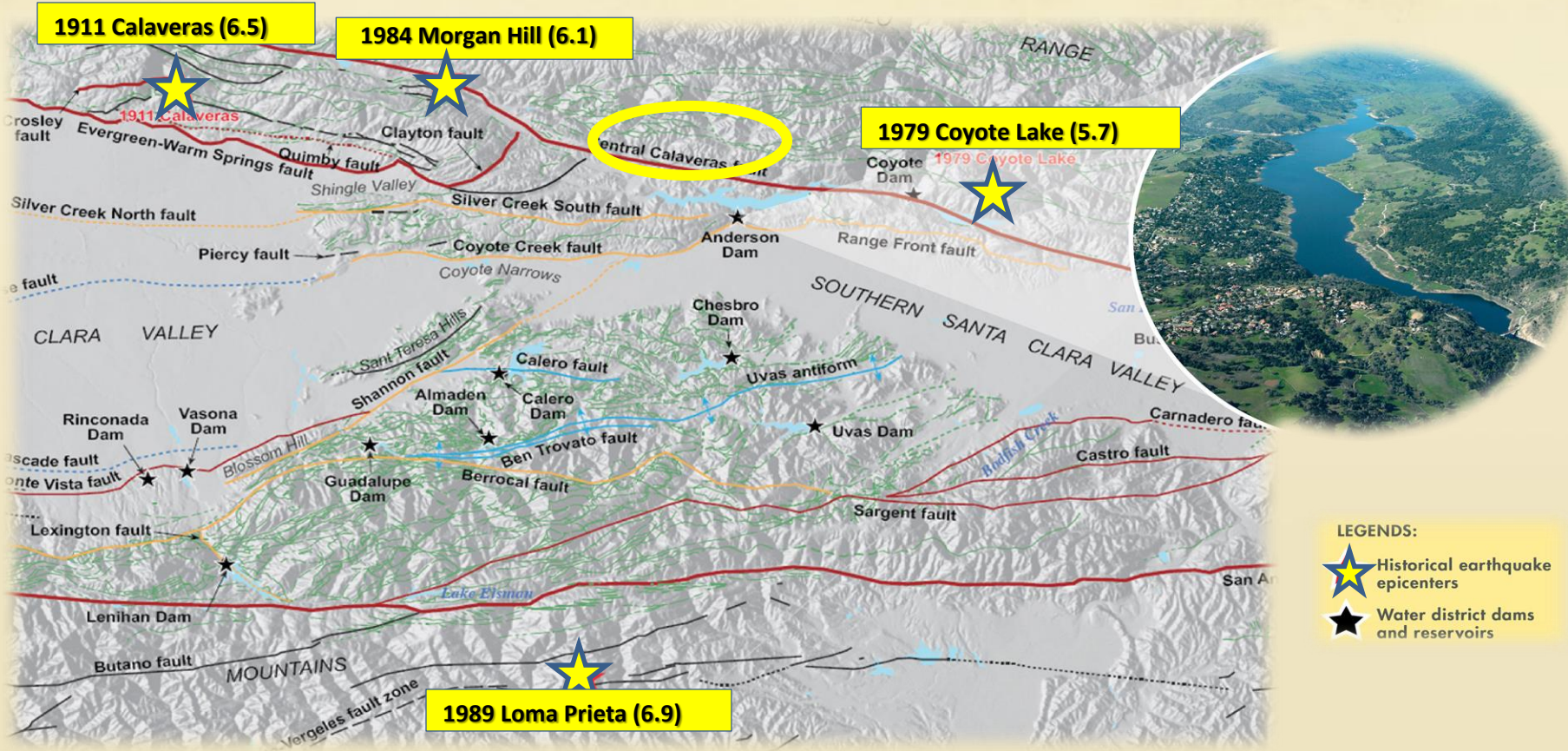
Outlet pipe

Dam embankment

Crest of dam

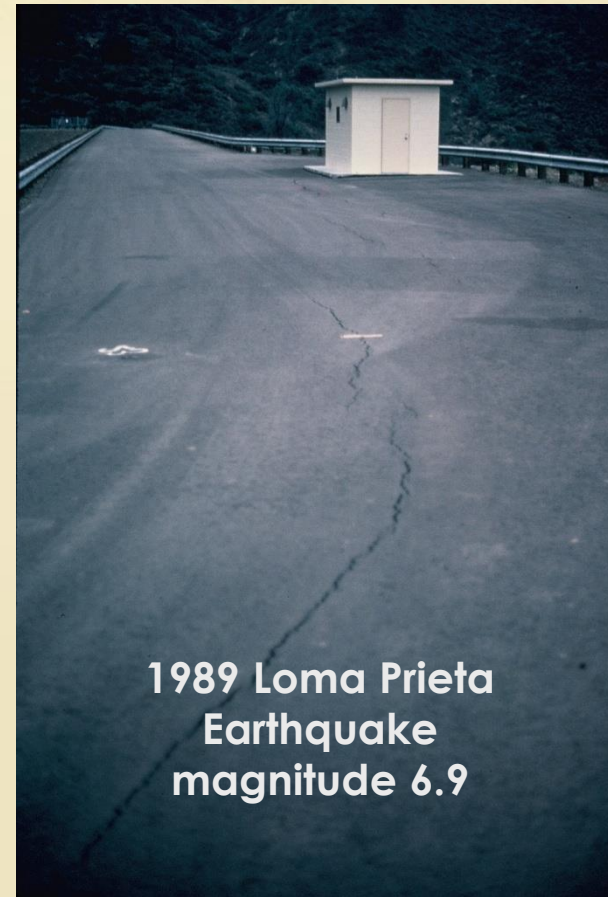
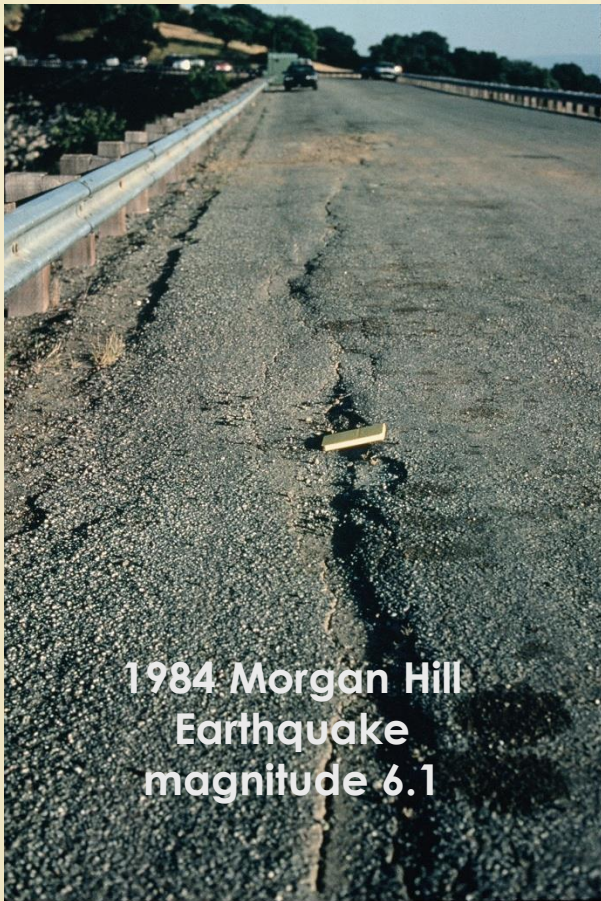
Seismic Activity in the Vicinity of Anderson Dam

Seismic environment



Anderson Dam Historical Earthquake Impacts

Embankments - Minor longitudinal cracking on dam crest

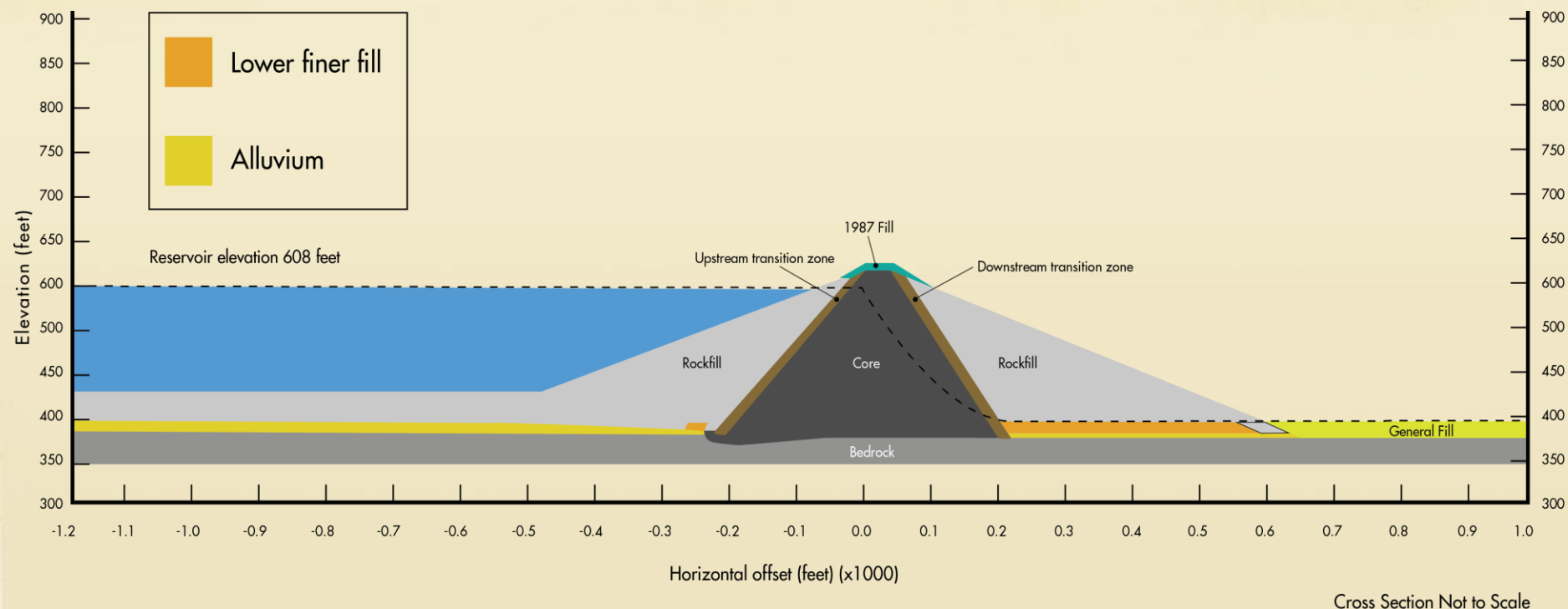


Problem Definition

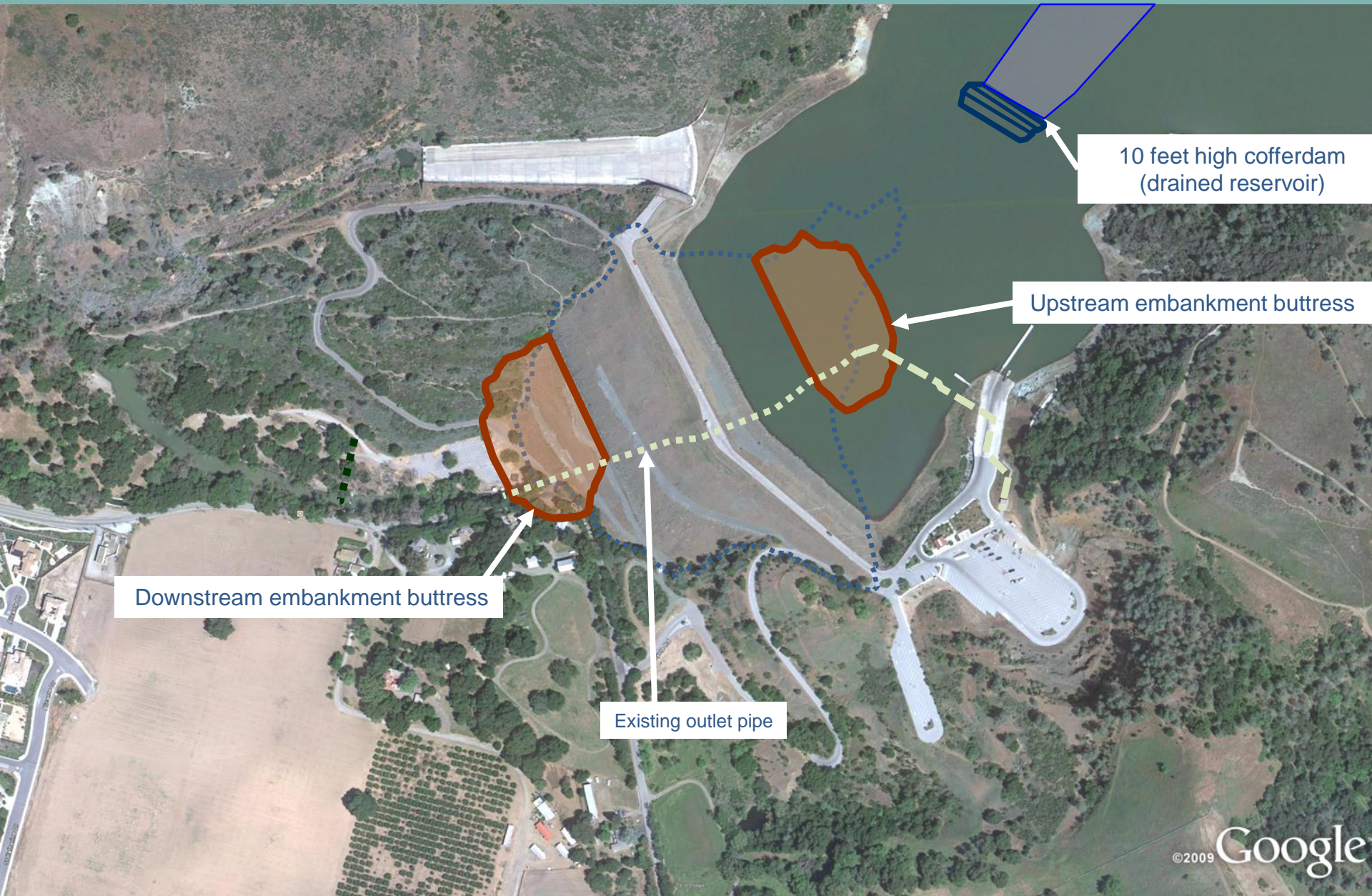
- ▶ **Magnitude 7.2 Earthquake on the Calaveras Fault or M6.6 on the Coyote Creek Fault**
 - ▶ Embankment slumps up to 25 feet due to liquefaction of lower fine fill and alluvium
 - ▶ Outlet conduit buckles up to 4 feet due to fault rupture on the Range Front Fault
- ▶ **Changes in Regulatory Requirements (DSOD and FERC)**
 - ▶ Outlet works does not meet current emergency drawdown criteria
 - ▶ Spillway undersized for Probable Maximum Flood

Existing Embankment Cross-section

Lower finer fill and alluvium predicted to liquefy during the maximum credible earthquake



Initial Project: Address Liquefaction



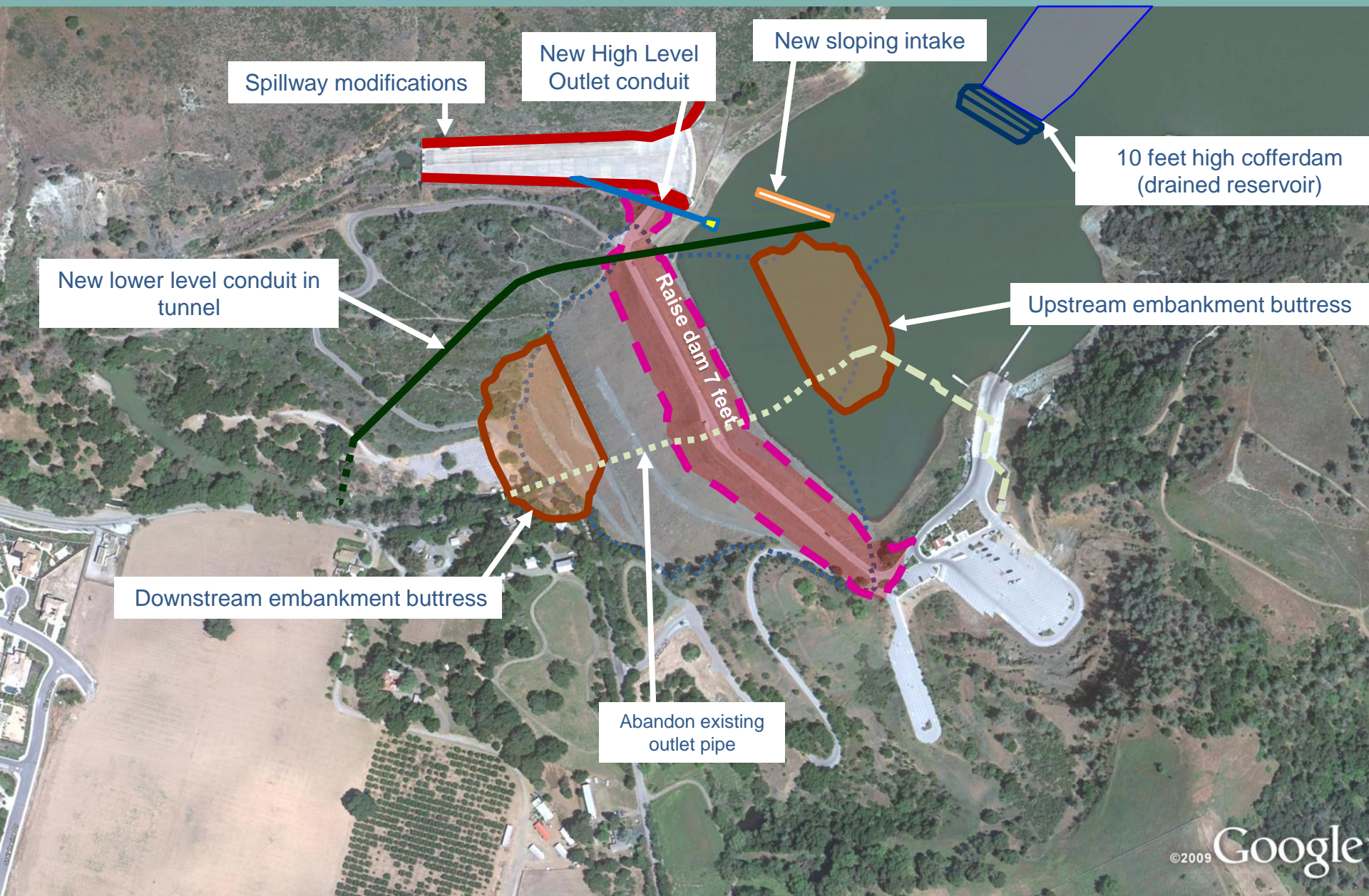
10 feet high cofferdam
(drained reservoir)

Upstream embankment buttress

Downstream embankment buttress

Existing outlet pipe

Original Project: Liquefaction, New Intake and Outlets, Spillway / Crest Modifications



Spillway modifications

New High Level Outlet conduit

New sloping intake

10 feet high cofferdam (drained reservoir)

New lower level conduit in tunnel

Upstream embankment buttress

Raise dam 7 feet

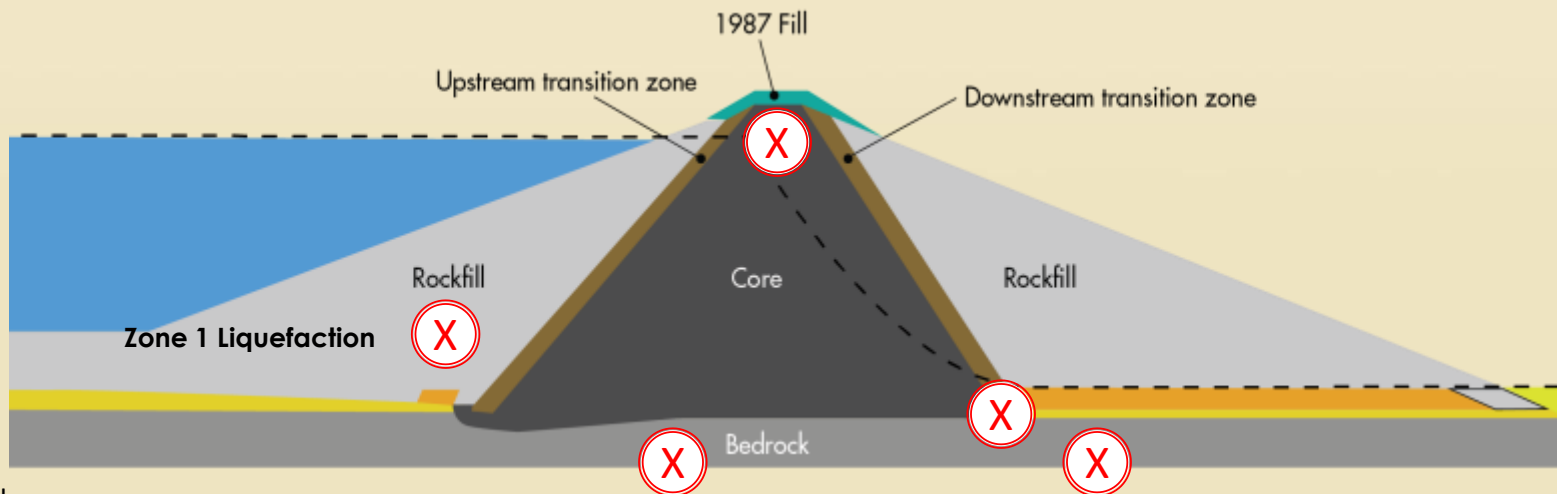
Downstream embankment buttress

Abandon existing outlet pipe

New Findings

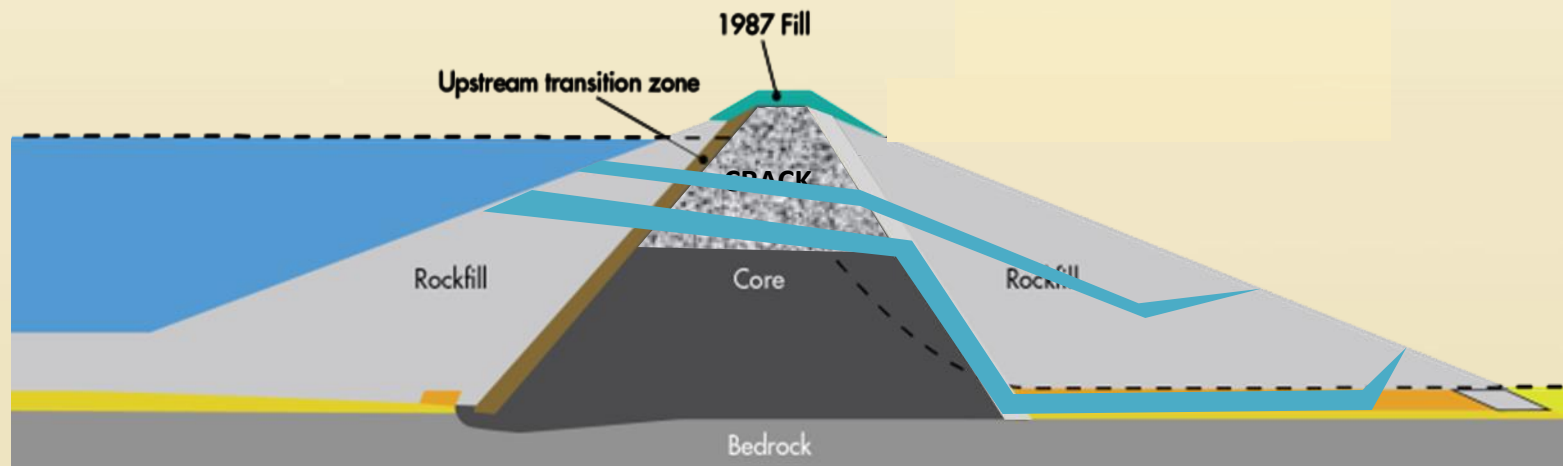


Shown:
Mapped traces of
Coyote Creek Fault



Dam Failure by Fault Rupture

- ▶ Key Findings
 - ▶ Downstream transition zone not functional
 - ▶ Impermeable core of the dam may crack
 - ▶ Seepage (piping) may occur



2016 Modified Project

▶ **More Extensive Embankment Retrofit and Additional Elements**

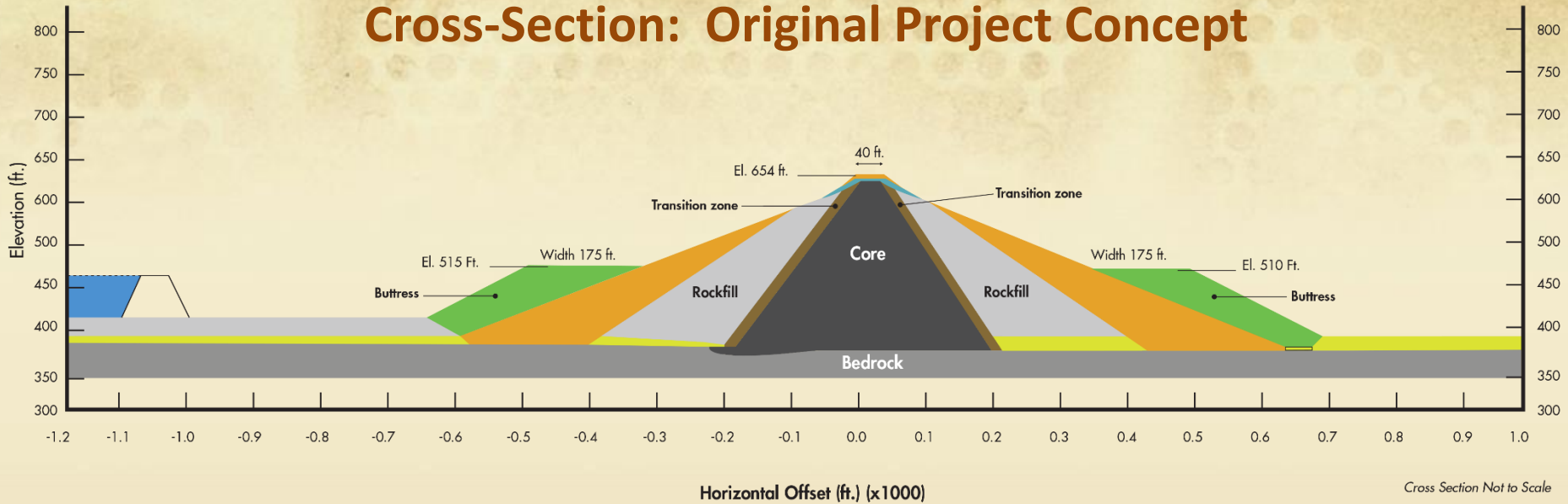
- ▶ Retrofitted embankment similar footprint to existing dam.
- ▶ Remove all liquefiable material (compared to previous buttress approach)

▶ **Other project elements remain unchanged**

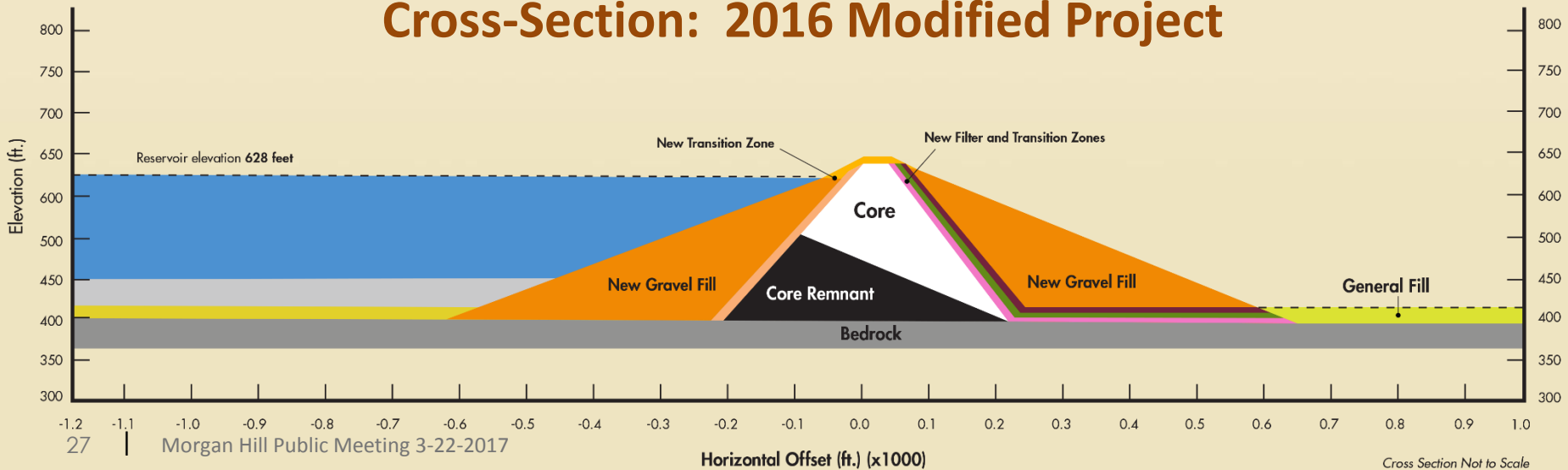
- ▶ New high level and low level outlet
- ▶ Spillway wall raise
- ▶ Temporary cofferdam
- ▶ New sloping intake
- ▶ Crest raise for additional freeboard

2016 Modified Project

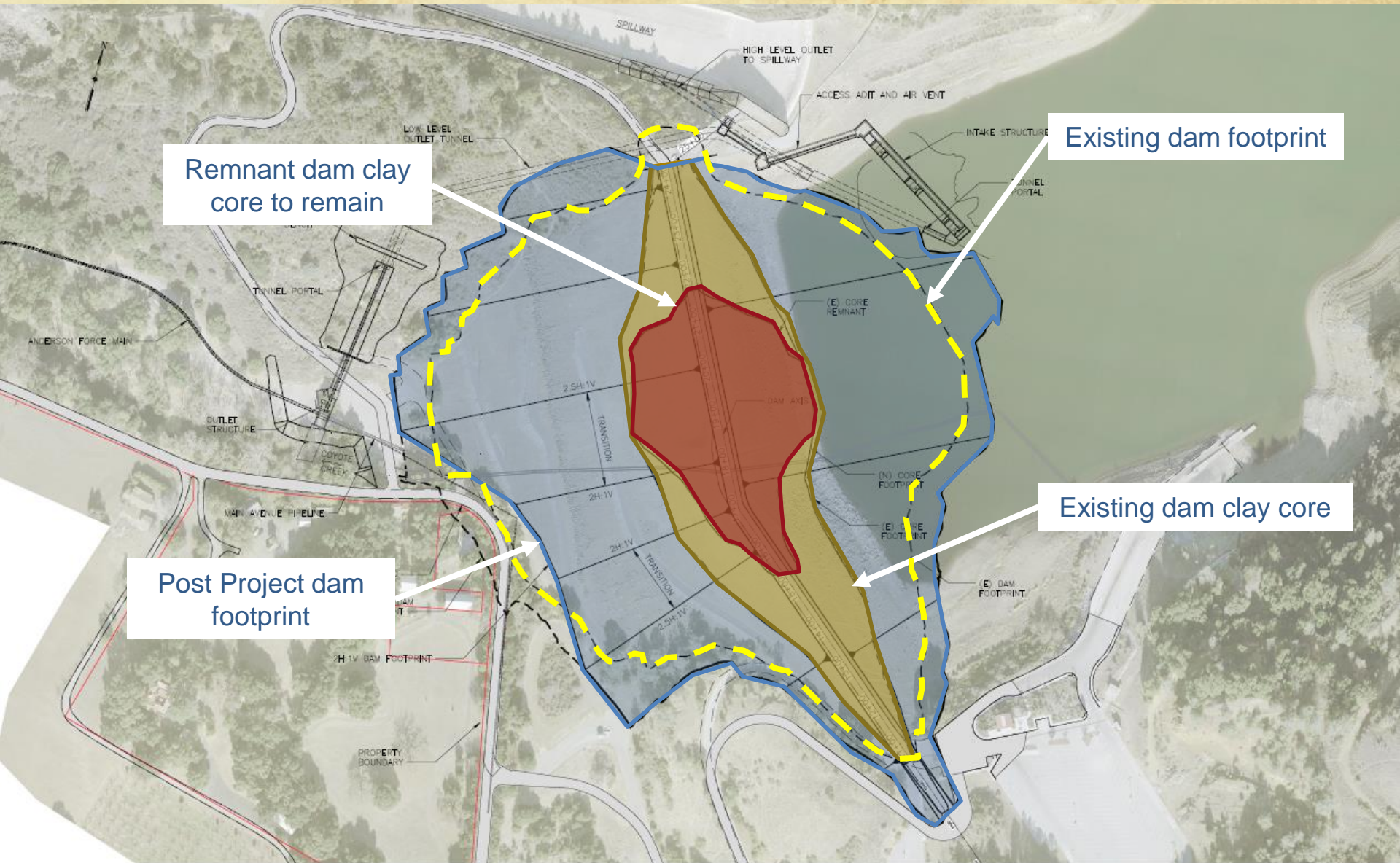
Cross-Section: Original Project Concept



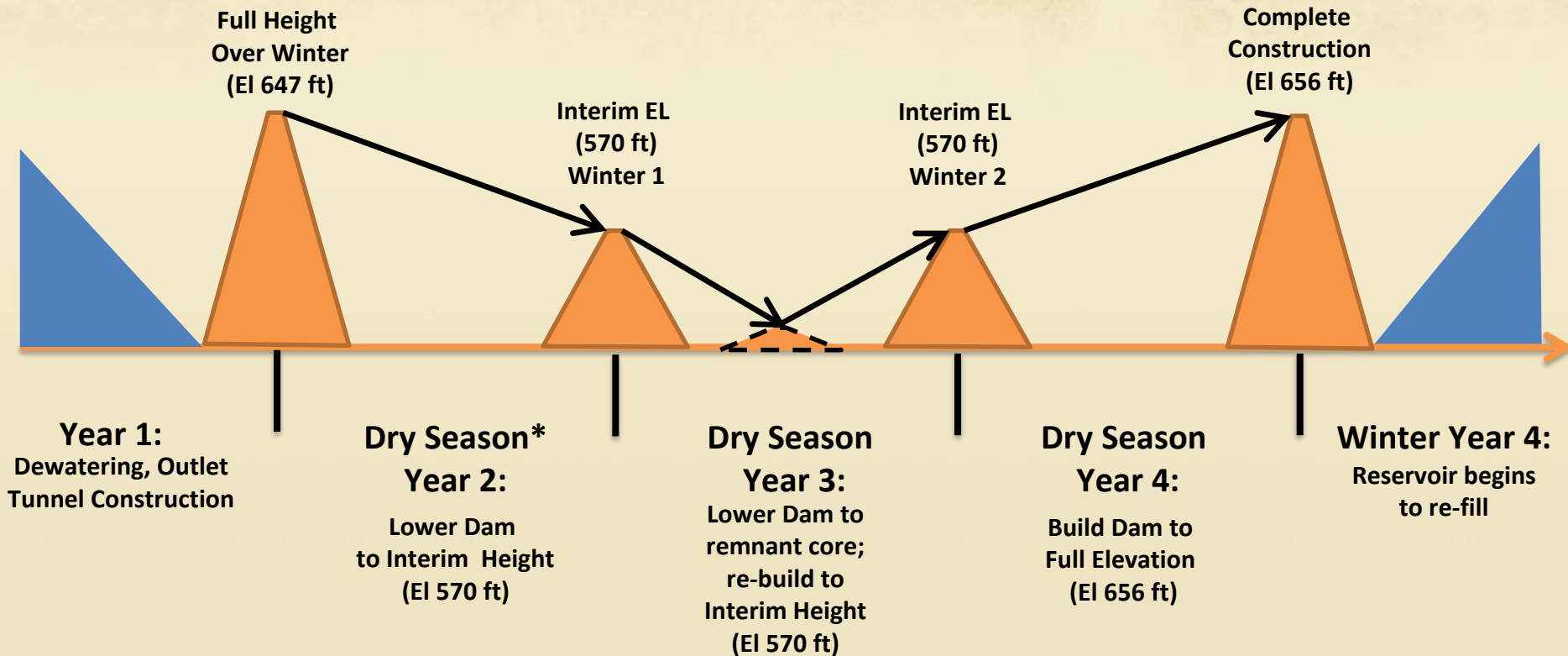
Cross-Section: 2016 Modified Project



2016 Modified Project Footprint



2016 Modified Project Construction Sequence



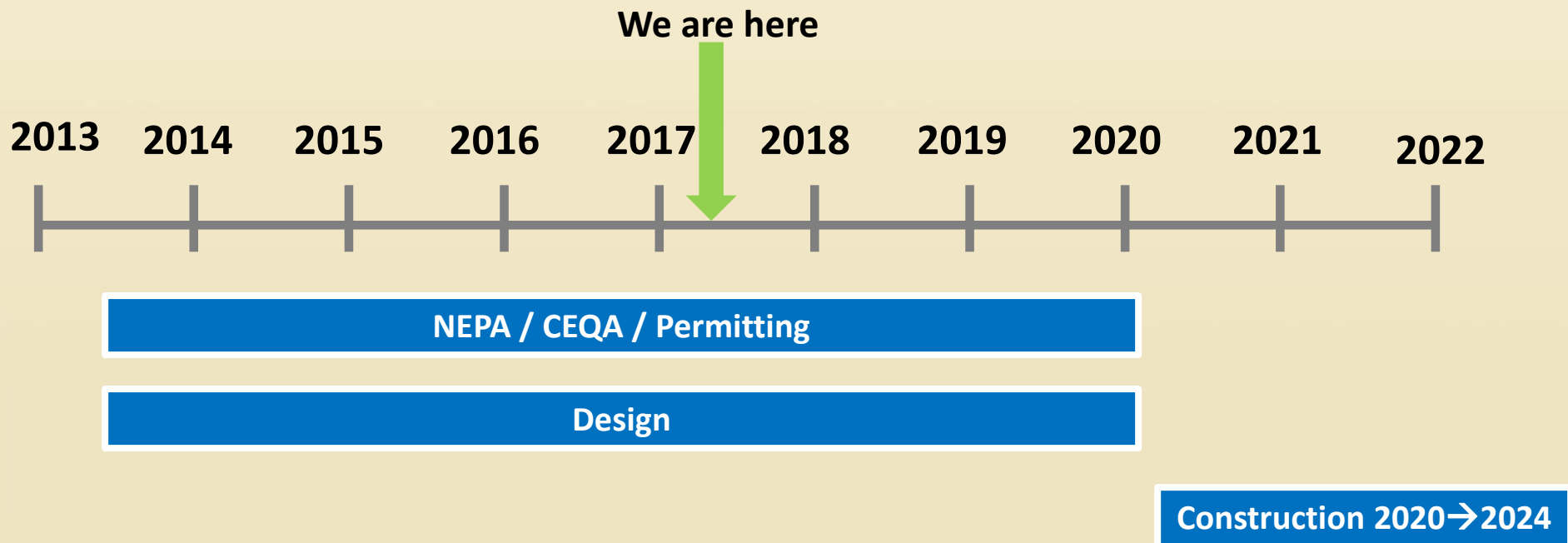
* Dry Season = April to October

Project Cost and Schedule

Project Cost:

- ▶ **Modified Project Cost ~ \$400M**

Project Schedule:



Next Steps and Public Meetings

- ▶ **30% Design – June 2017**
- ▶ **60% Design – December 2017**
 - ▶ **Public meeting in early 2018**
- ▶ **Draft Environmental Impact Report (EIR) for Public Review – Summer 2018**
 - ▶ **A public meeting for Draft EIR in late summer 2018**
- ▶ **90% Design – September 2018**
 - ▶ **Pre-construction meetings in 2019-2020**
- ▶ **Start of Construction - 2020**

Stay Informed

<http://www.valleywater.org/Services/AndersonDamAndReservoir.aspx>

- ▶ Sign up to receive project updates via email.
- ▶ View project reports, maps, history and other information.
- ▶ Coming later in 2017: project blog

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Special Status Plants



Coyote Ceanothus



Tiburon Paintbrush



Mt. Hamilton Thistle



S. Clara Valley Dudleya



Smooth Lessingia



Metcalf Canyon Jewel-flower

Special Status Animals



California Red-Legged Frog



Western Pond Turtle



Dusky Footed Woodrat



California Tiger Salamander

Anderson Geotechnical Investigations

