

Calaveras Dam Replacement and Alameda Creek Diversion Dam Fish Passage Facilities

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UTILITIES COMMISSION



San Francisco
Water Power Sewer

Services of the San Francisco Public Utilities Commission

IT'S NOT "IF" BUT "WHEN"



San Francisco
1906



Hayward 1868



Loma Prieta 1989

Water System Improvement Program (WSIP)



- 87 projects
 - 2 dams
 - 3 tunnels
 - 3 treatment facilities
 - Pipelines, pump stations, reservoirs, tanks, etc.
- 7 counties
- \$4.8 Billion
- Over 90% Complete
- Complete in 2019

CALAVERAS DAM REPLACEMENT



Calaveras Dam & Reservoir - 2011



Project Status

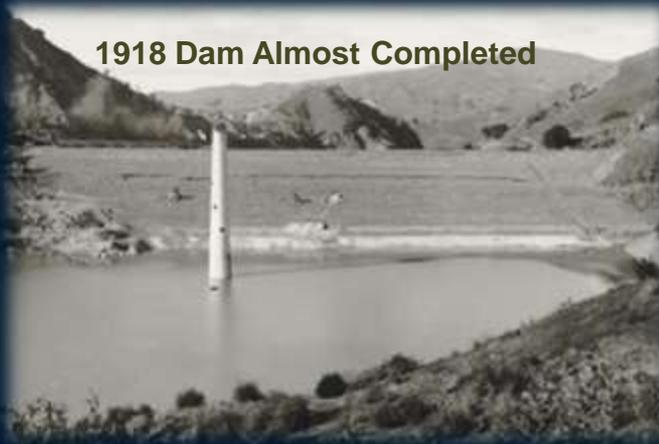
- Construction Start ~ Aug 2011
- Completion ~ June 2019
- Duration ~ 8 years
- Total Project Cost > \$810M
- Embankment Dam work to begin late 2016



Original Construction Began 1913



Completion of Calaveras Dam



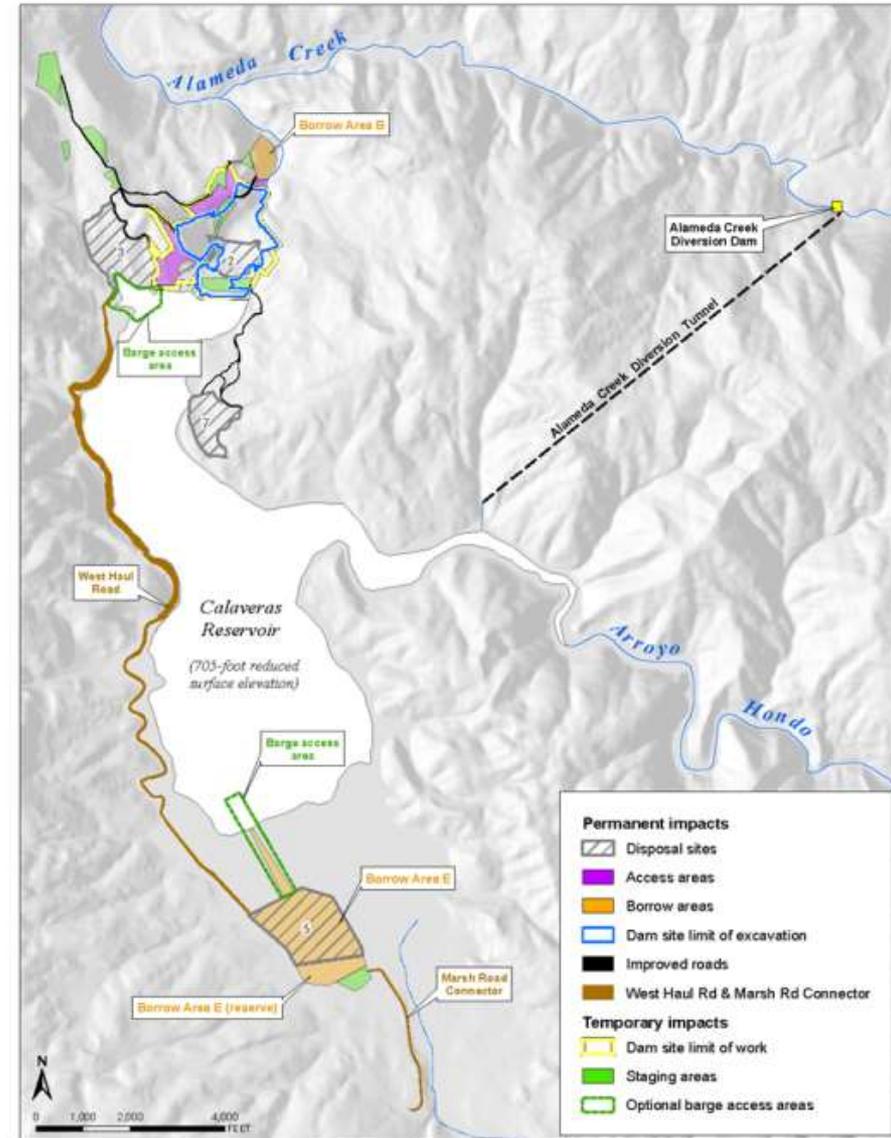
Project Purpose

- Replace the existing dam with a dam that meets current seismic safety standards
- Dam to have robust design that could accommodate potential future enlargement
- Upon completion, the DSOD restriction would be lifted and the reservoir capacity restored
- Project would help meet Level of Service objectives for WSIP

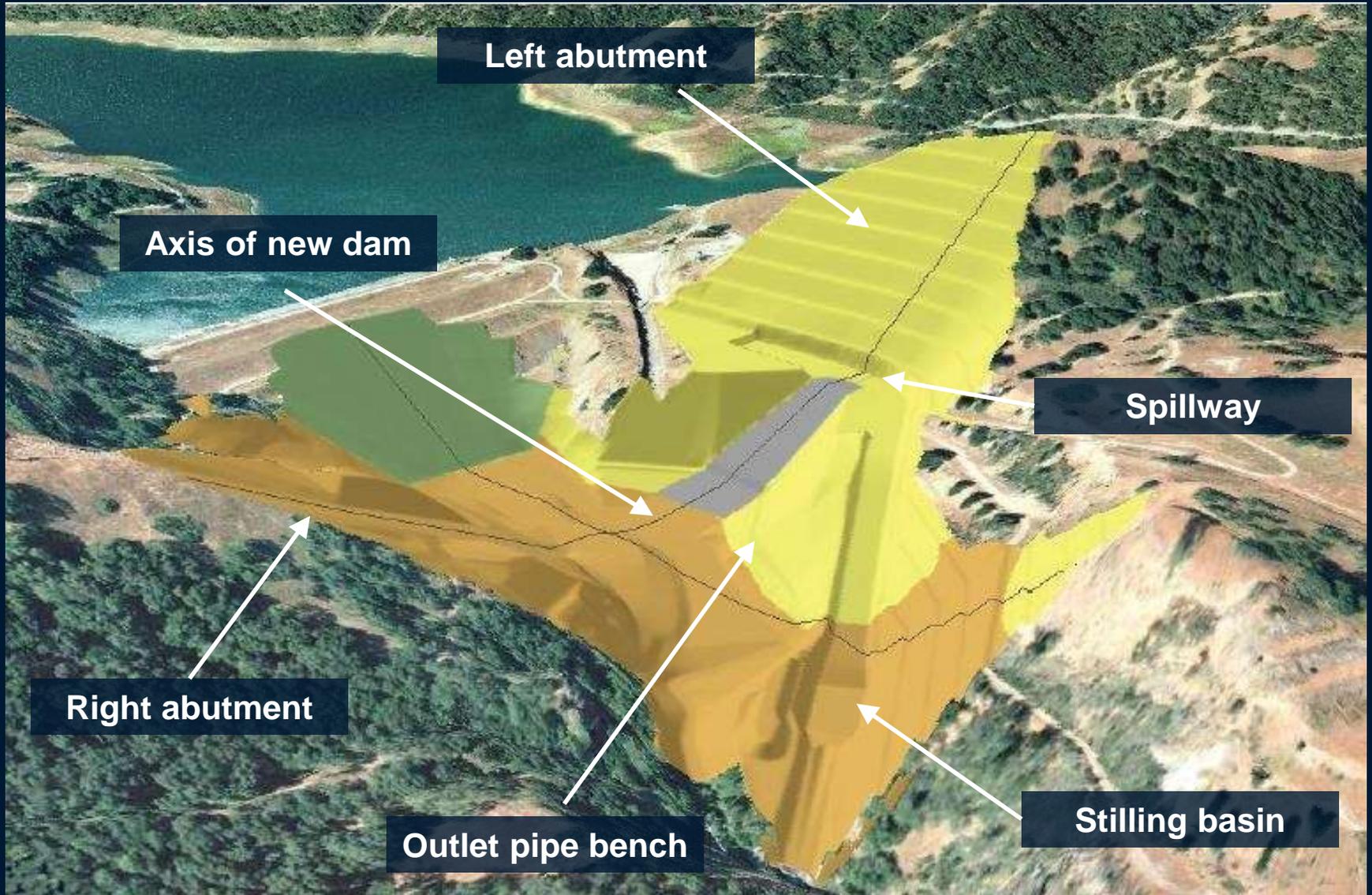


Project Scope

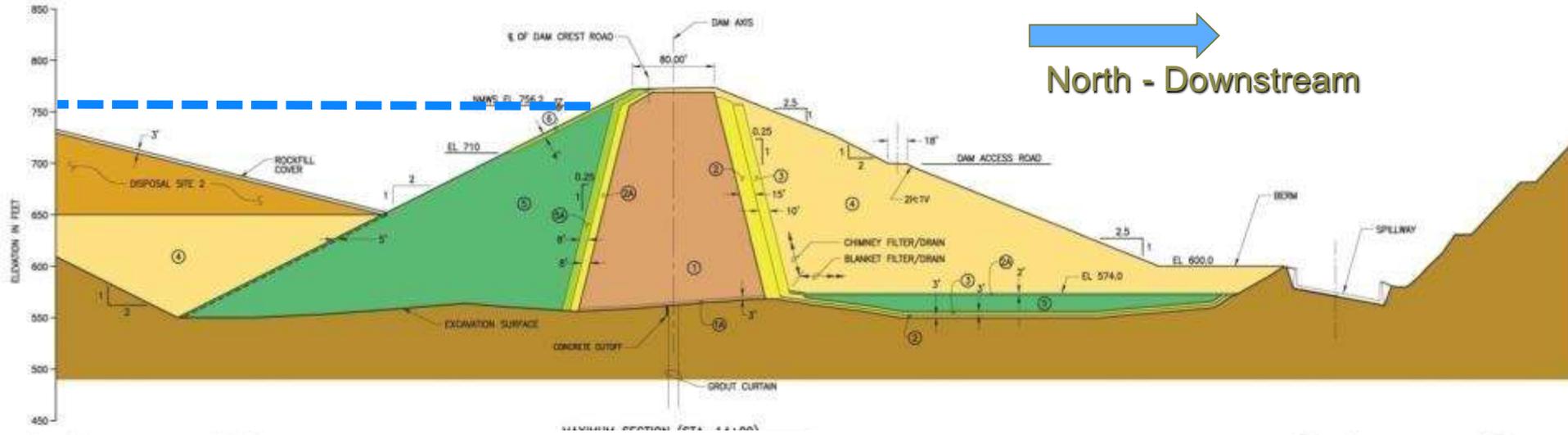
- Replacement Dam
- Spillway
- Stilling Basin
- Intake/Outlet Works
- Borrow Areas
- Disposal Sites
- Haul Roads
- Staging Areas
- Fish Screens
- Fish Passage at ACDD
- Habitat mitigation



Foundation Excavation

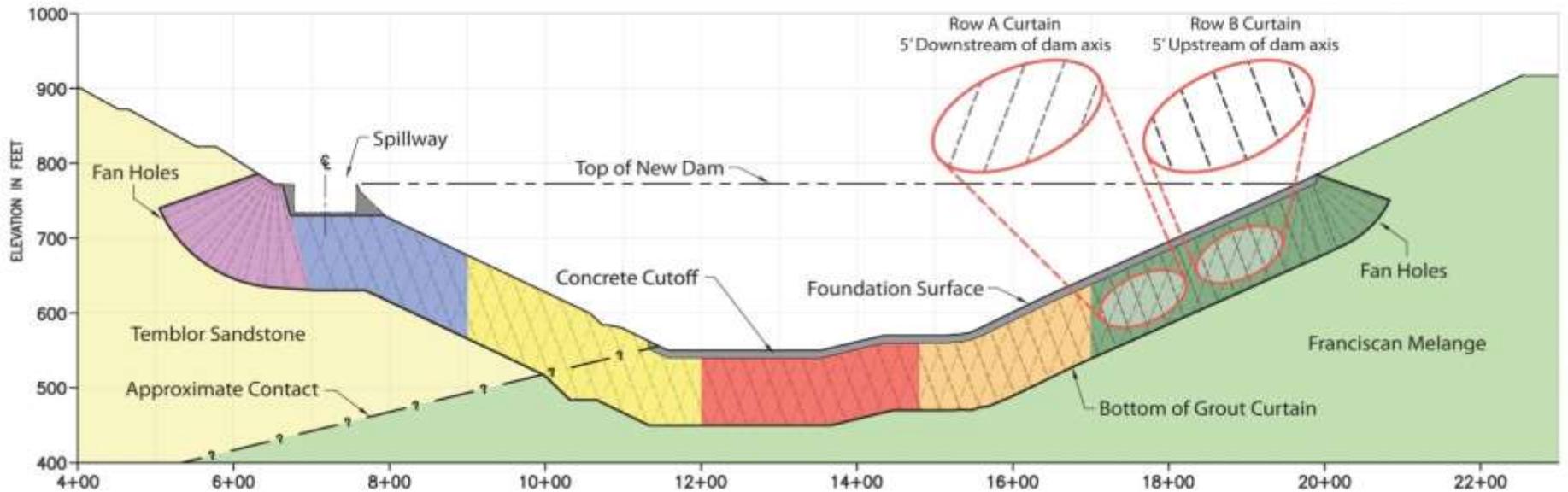


Replacement Dam



L. ABUTMENT / WEST

R. ABUTMENT / EAST





Borrow Area B



Disp Active Treatment System

Disposal Site

Bluestone Building

Left Abutment (Observation Hill)

Upper Spillway Chute

Electrical Building

New Dam Axis

Intake Tower

Existing Dam (Cofferdam)

Lower Spillway Chute

78" Pipeline

Stilling Basin

Borrow Area B

Right Abutment

Construction Challenges





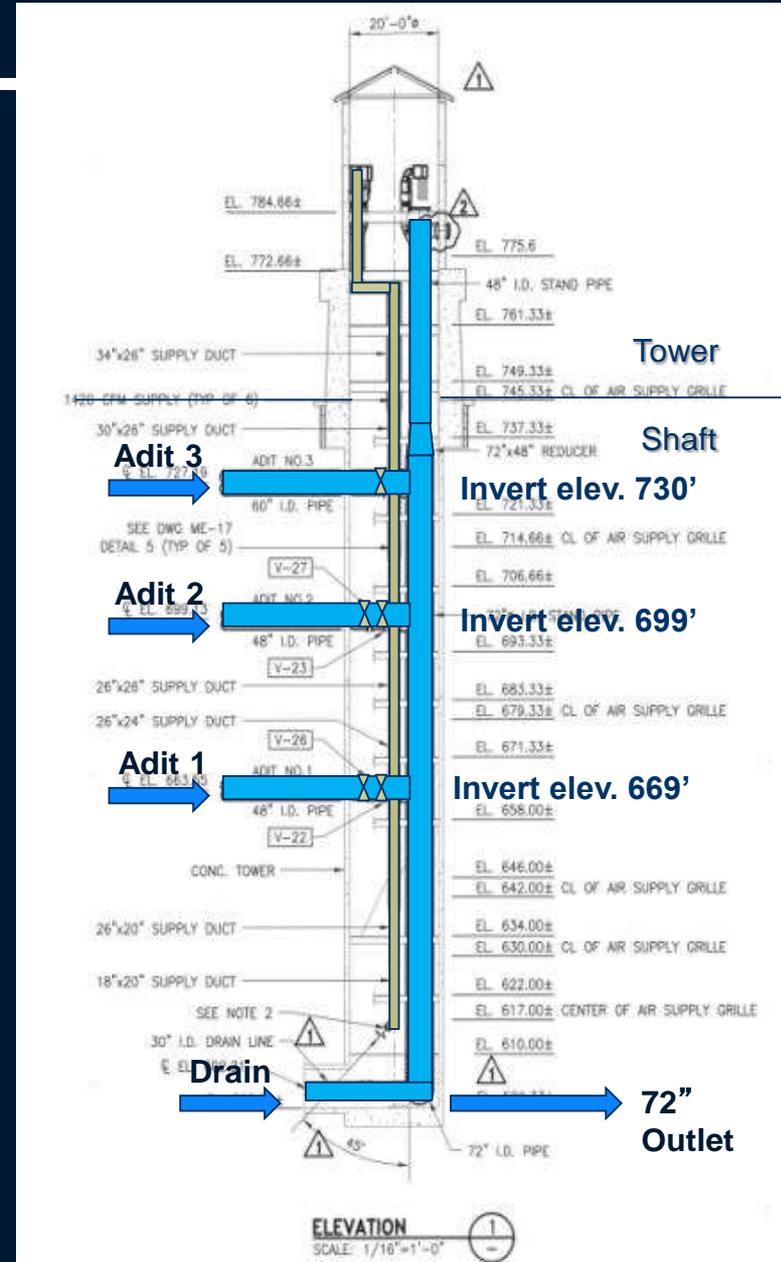
Calaveras Dam
Replacement Project
Spillway Completion
April 2016

Intake Tower



Intake Tower

- Inlet Conduits
 - 30-inch ID Drain Line
 - 48-inch ID Adits 1 and 2
 - 60-inch ID Adit 3
 - 72-inch ID Pipe Riser
- Extension of Outlet Conduits
- New Fish Screens at Adits 1 and 2



Operation of Calaveras Reservoir

- Maintain reservoir elevation between 693' and 705' during construction
- Maintain outlet works for downstream flow releases during construction
- Maintain high water quality during construction



Special Status Species



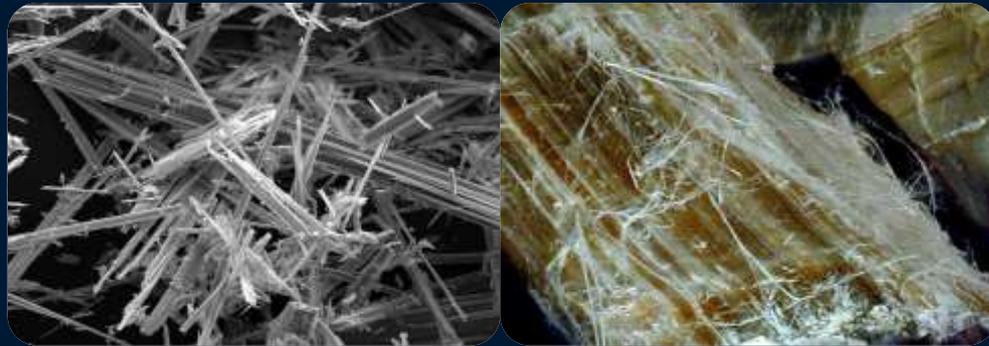
Environmental Compliance Record

Species (Federally or State Listed – Threatened or Endangered)	Total Number of Incidental Take Allowed in the U.S. Fish and Wildlife Service and National Marine Fisheries Service BO	Incidental Take to Date
California tiger salamander	15	2
California red-legged frog	25	0
Alameda whipsnake	10	0
Callippe silverspot butterfly	5	0
Steelhead (NMFS)	N/A – only related to operation and trapping	N/A



Natural Occurring Asbestos (NOA) Compliance Program

- Protect Onsite Workers
- Protect Offsite Public
- Regulatory Compliance





Calaveras Dam, San Francisco, CA

April 2012 - April 2016

ALAMEDA CREEK DIVERSION DAM FISH PASSAGE FACILITIES

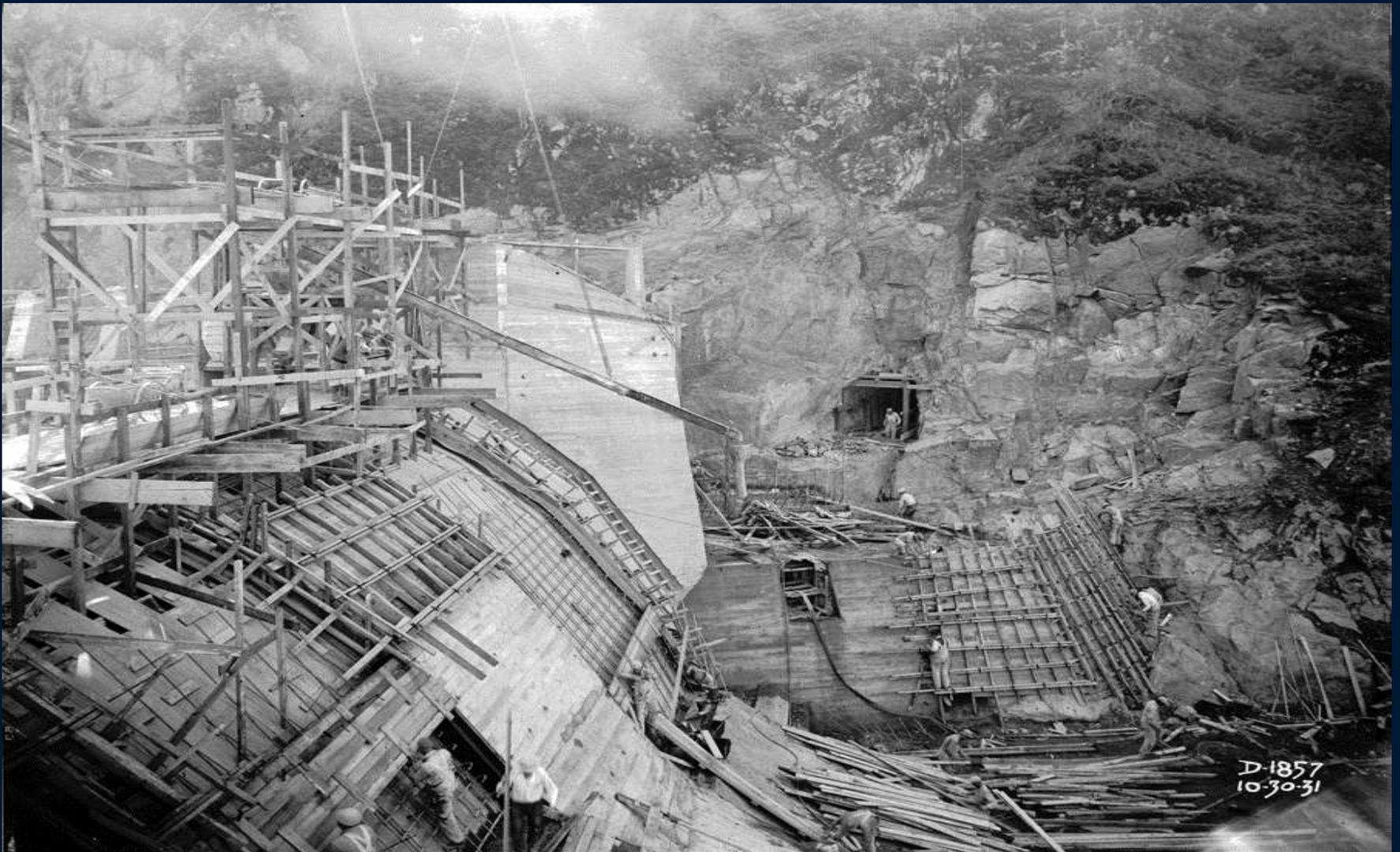


Hetch Hetchy
Regional
Water
System





Hetch Hetchy
Regional
Water
System





Hetch Hetchy
Regional
Water
System



D-1905
12/28/31

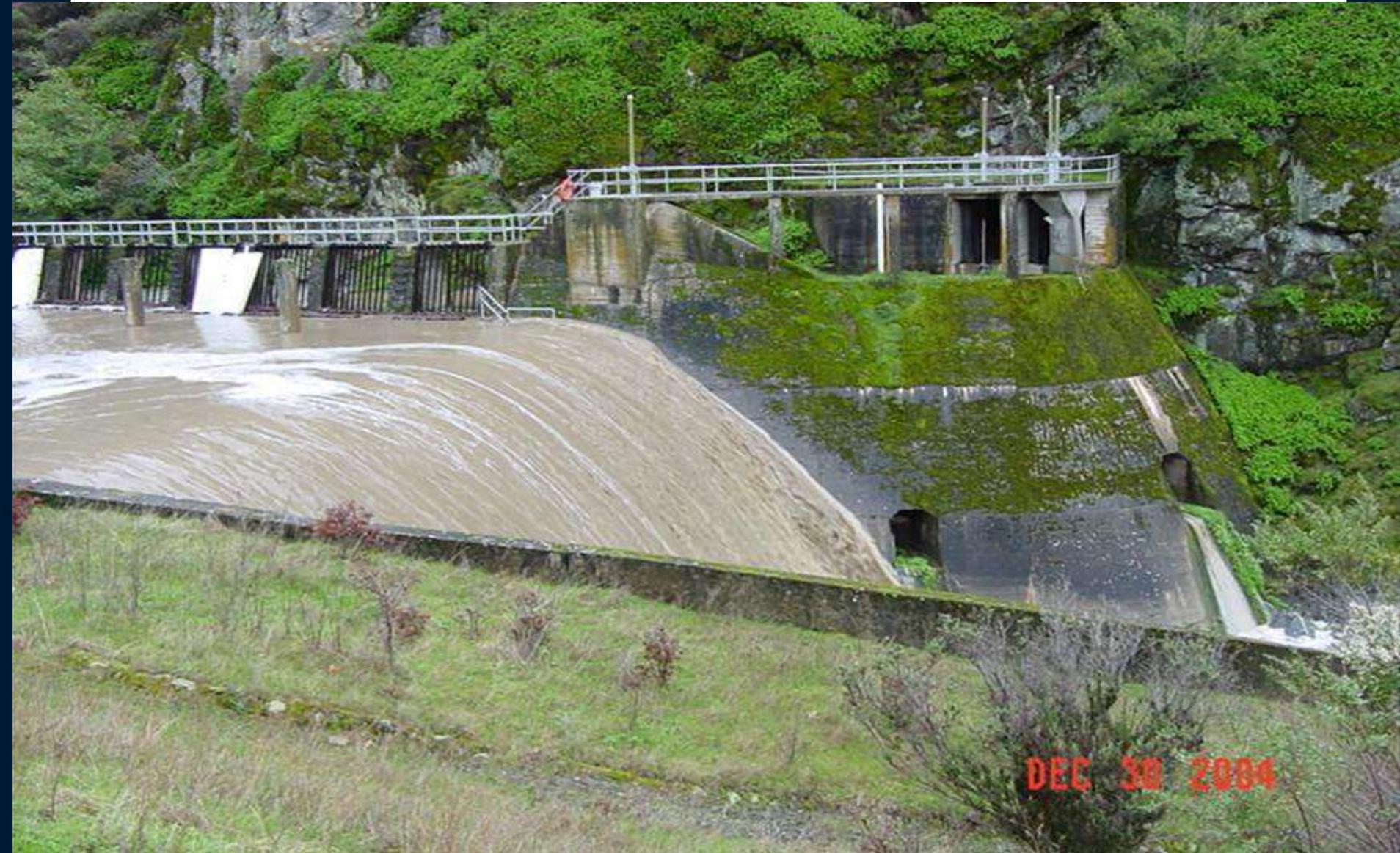


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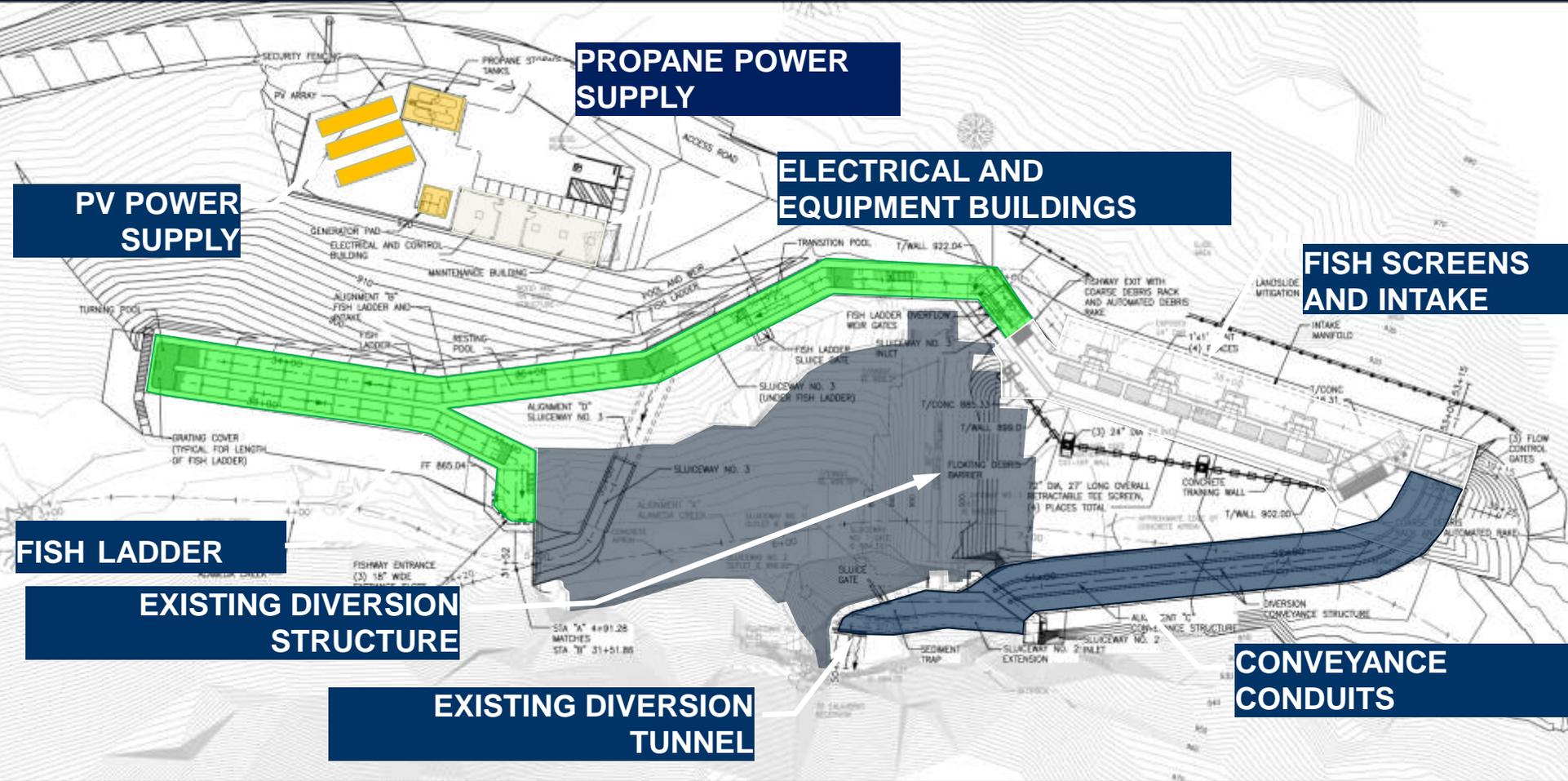
Hetch Hetchy
Regional
Water
System



DEC 30 2004



Design Overview - Primary 95% Design Elements



PROPANE POWER SUPPLY

ELECTRICAL AND EQUIPMENT BUILDINGS

FISH SCREENS AND INTAKE

PV POWER SUPPLY

FISH LADDER

EXISTING DIVERSION STRUCTURE

EXISTING DIVERSION TUNNEL

CONVEYANCE CONDUITS

Design Overview - Fish Screens

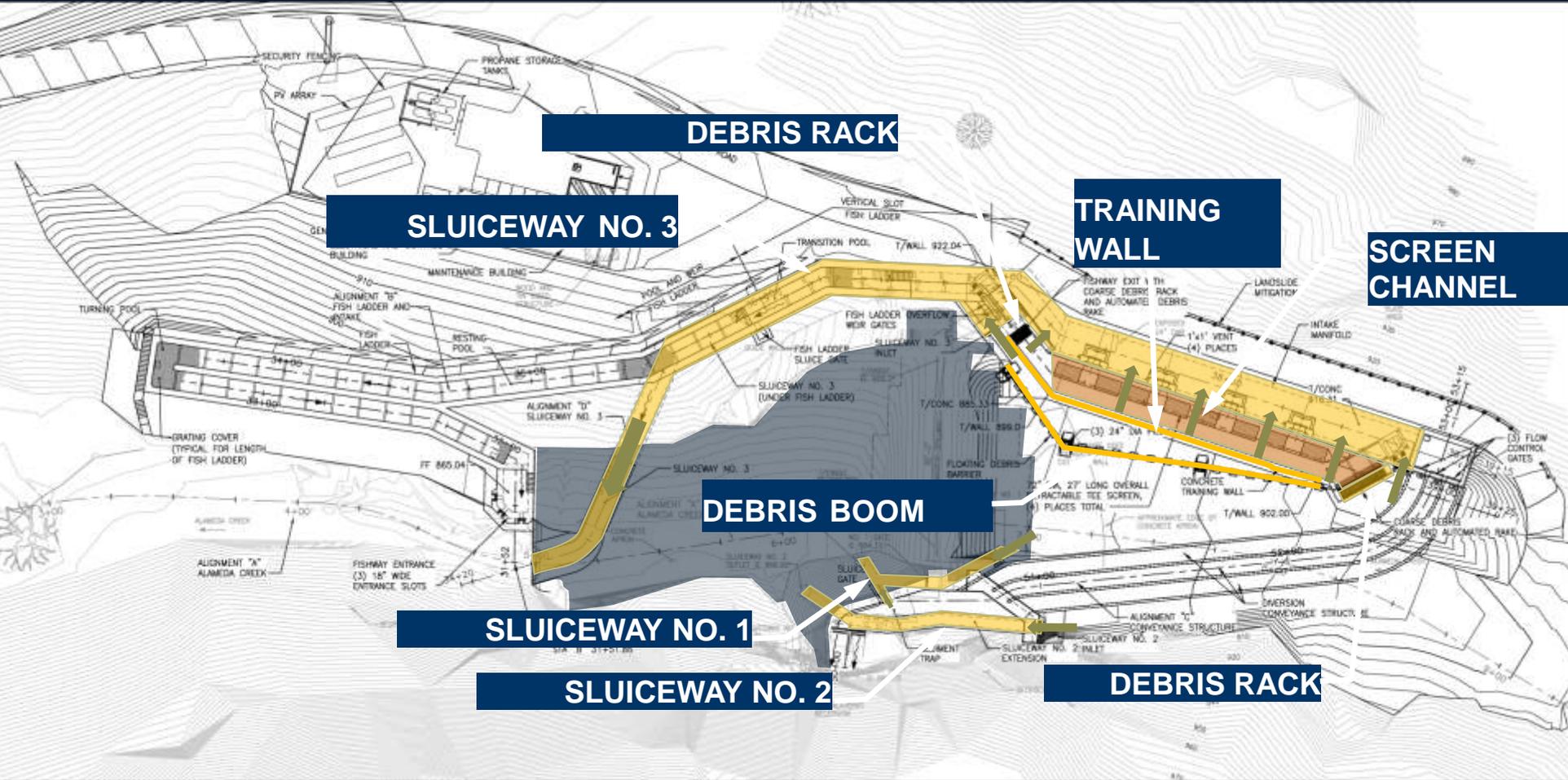


Retractable Cylindrical
Screens – automated
with rotating drums and
stationary brush arms

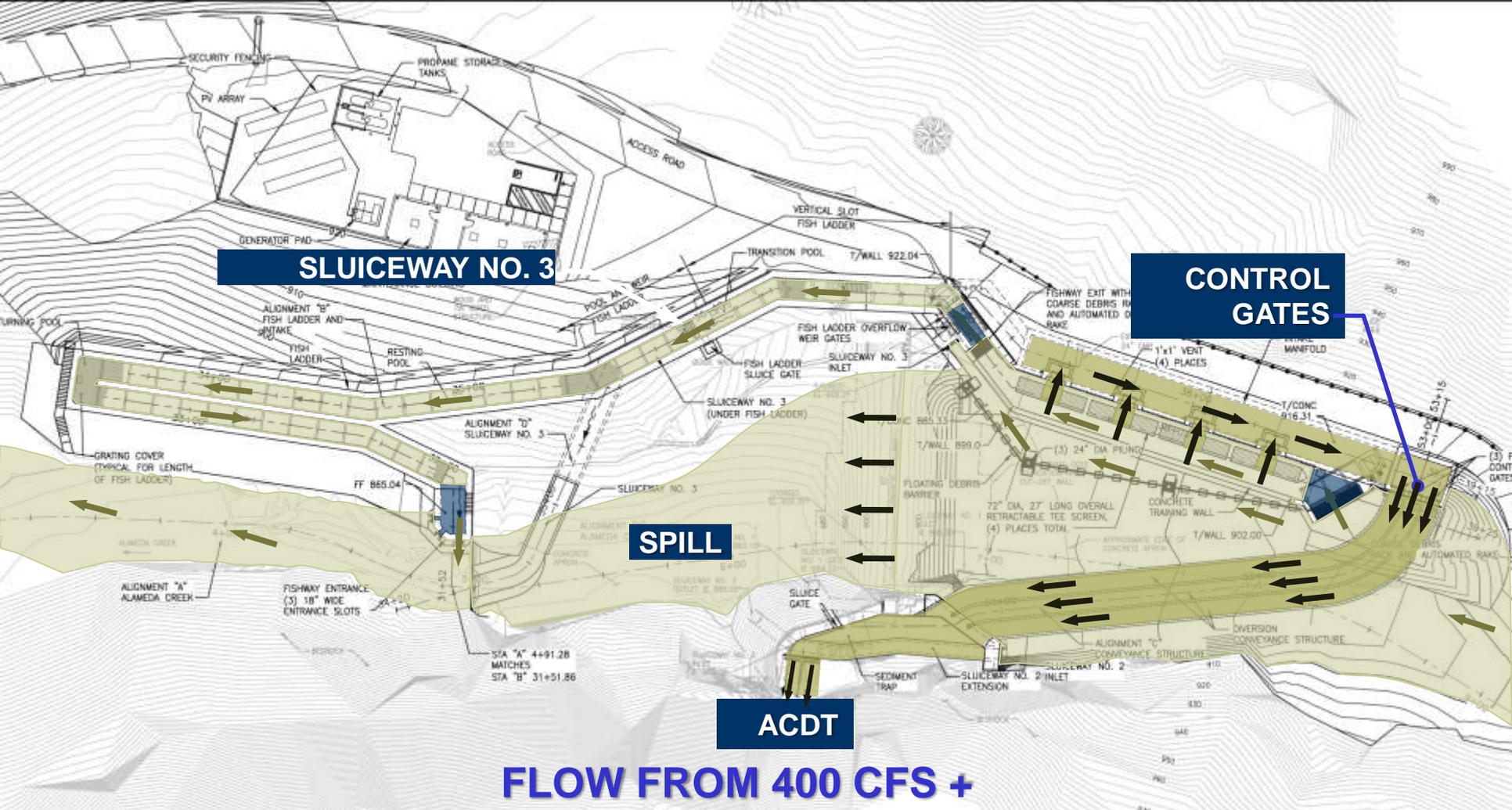




Design Overview Sediment & Debris Management Features

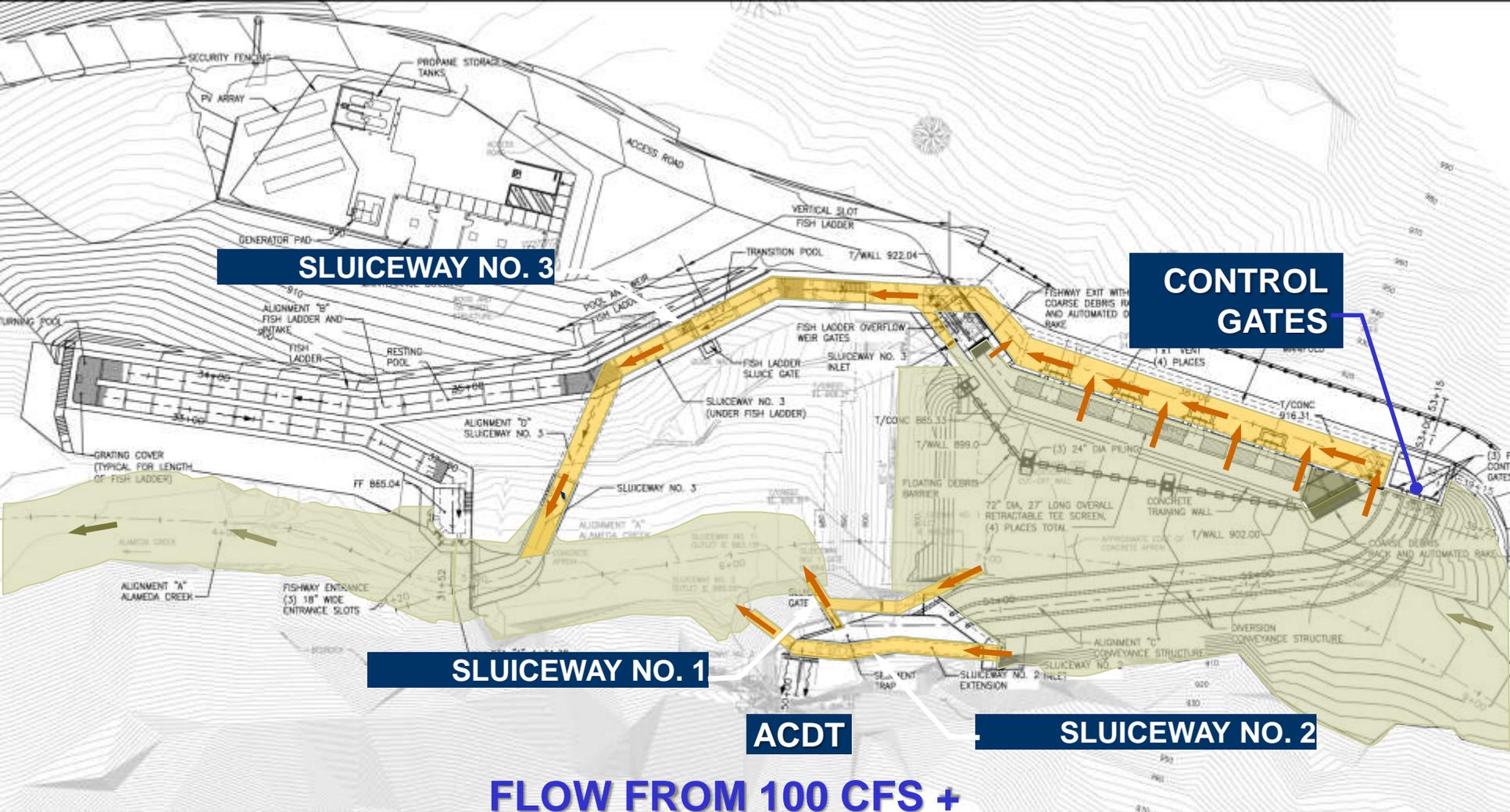


Operations – Diversion



FLOW FROM 400 CFS +

Operations – Sluicing



Construction – June 2016





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**Regional
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System**





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Questions?

sfwater.org/sunolvalley

