



Engineering, Operations & Technology Committee

# State Water Project Resilience Update

Item 6b

May 13, 2024

# Item 6b SWP Resilience Update

## Subject

Update on Department of Water Resources' (DWR's) State Water Project (SWP) resilience efforts

## Purpose

Respond to board questions regarding SWP facilities including DWR's seismic resilience program, Sisk Dam activities, and East Branch operations

## Next Steps

Continue collaboration and consultation with DWR on resilience efforts

## SWP Resilience Update

### Requests by the Board from February 2024

- Update on DWR's seismic resilience program
- Update on Sisk Dam current activities and future proposals
- Update on role of Pearblossom Pumping Plant on East Branch capacity limitations and Metropolitan operations

# DWR's Seismic Resilience Program

# Primary Measures to Enhance SWP Seismic Resilience

- Pre-event mitigation
  - Perform initial evaluations (walkdowns) to identify vulnerabilities and prioritize retrofit efforts
  - Conduct detailed assessments/retrofit design
  - Implement planned retrofits
- Preparation for post-event response
  - Upgrade monitoring system to ensure effective deployment of resources
  - Organize emergency response and conduct frequent exercises



Edmonston Pumping Plant

## SWP Seismic Network

DWR uses data to evaluate the effectiveness/value of each seismic station before replacing instruments and prior to building new stations.

## DWR Seismic Monitoring along SWP

- Operates 105 active seismic stations
  - Replacement of obsolete instruments started in 2021
- Replaced 51 stations, with remaining stations to be replaced over next 6 years
- Updated 17 seismic stations and constructed 7 new stations as part of the California Earthquake Early Warning System
- Maintains 13 seismic switches along the SWP
  - Automatically activated
  - Protects infrastructure



# Seismic Modernization Programs for Southern California Reservoirs

## Pyramid Lake



Low-level outlet tower  
with potential  
vulnerability

Detailed evaluation  
underway

## Castaic Lake



Tower bridge retrofit  
completed 2022

High- and low-level  
outlet tower risk mitigation

Design ongoing for  
tower debris mitigation

## Lake Perris



Dam retrofit  
completed 2018

Studies ongoing on new  
emergency release facility

# DWR Performs Seismic Walkdowns on SWP Facilities

- Seismic walkdowns originated in 2014 as part of the Oroville Dam Safety Recommendations
- Recently Completed Seismic Walkdowns
  - Oroville Flood Control Outlet (2022)
  - Hyatt Powerplant (2023)
- Ongoing Seismic Walkdowns
  - Pearblossom Pumping Plant
  - Devil Canyon Powerplant
- Planned Seismic Walkdowns
  - Edmonston Pumping Plant



Hyatt Powerplant  
Seismic Walkdown



# DWR and Metropolitan Collaborate on Seismic Resiliency



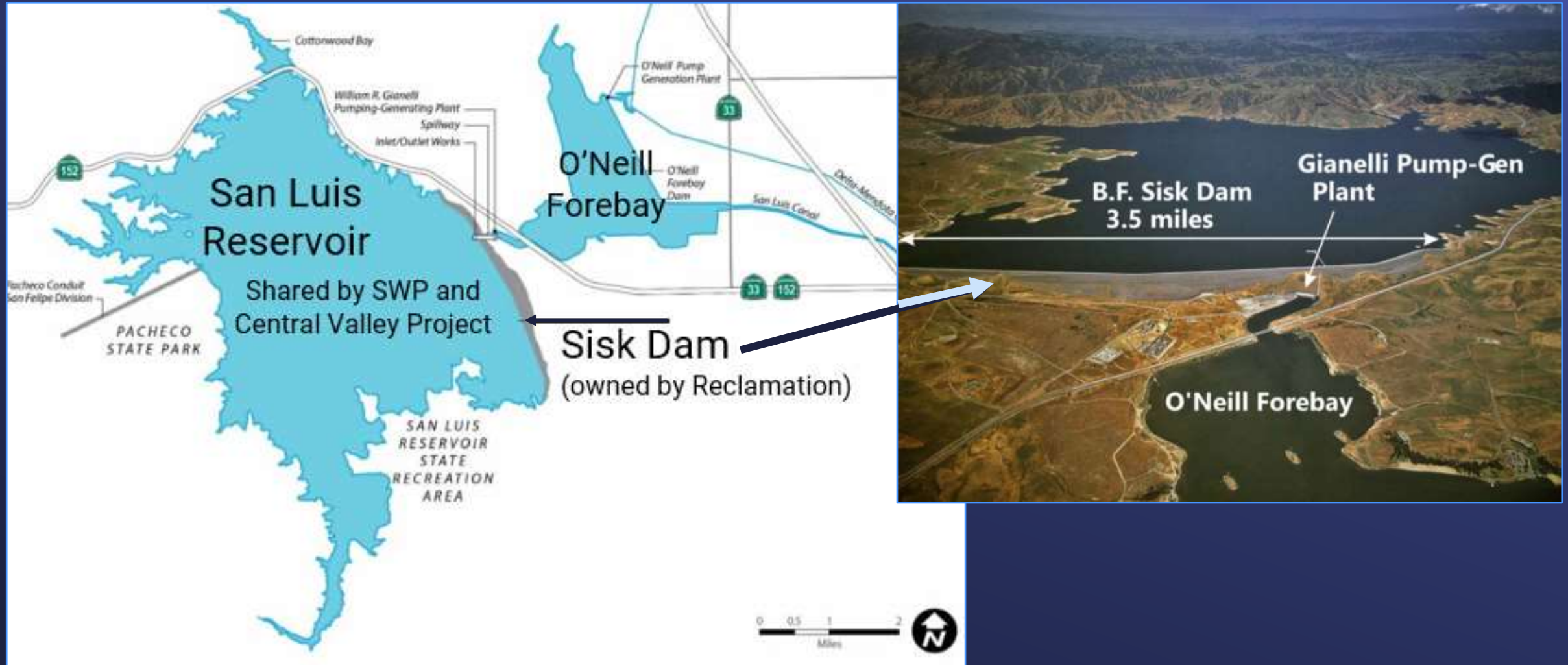
**DWR/Metropolitan Seismic Resilience Meeting  
Jensen Plant – April 11, 2024**

- Aqueduct Seismic Resilience Task Force
- Joint exercises for post-earthquake response
- Exchange of information and assistance
- Coordination on DWR proposed efforts, including upcoming outages

# Status Update on B. F. Sisk Dam

# Sisk Dam Safety of Dams Modification Project

## Improving Seismic Resilience





# Seismic Modernization of Sisk Dam

## Improving Seismic Resilience

2028 -  
2032



Raise crest  
of the dam

Sisk Dam Safety  
Modification Project

Sisk Dam  
Expansion  
(federal project)

2022 -  
2028



Work on berms &  
spillway



Environmental  
compliance &  
permitting

Crest Raise

Existing Sisk Dam

Stability Berm

Toe Drain  
System



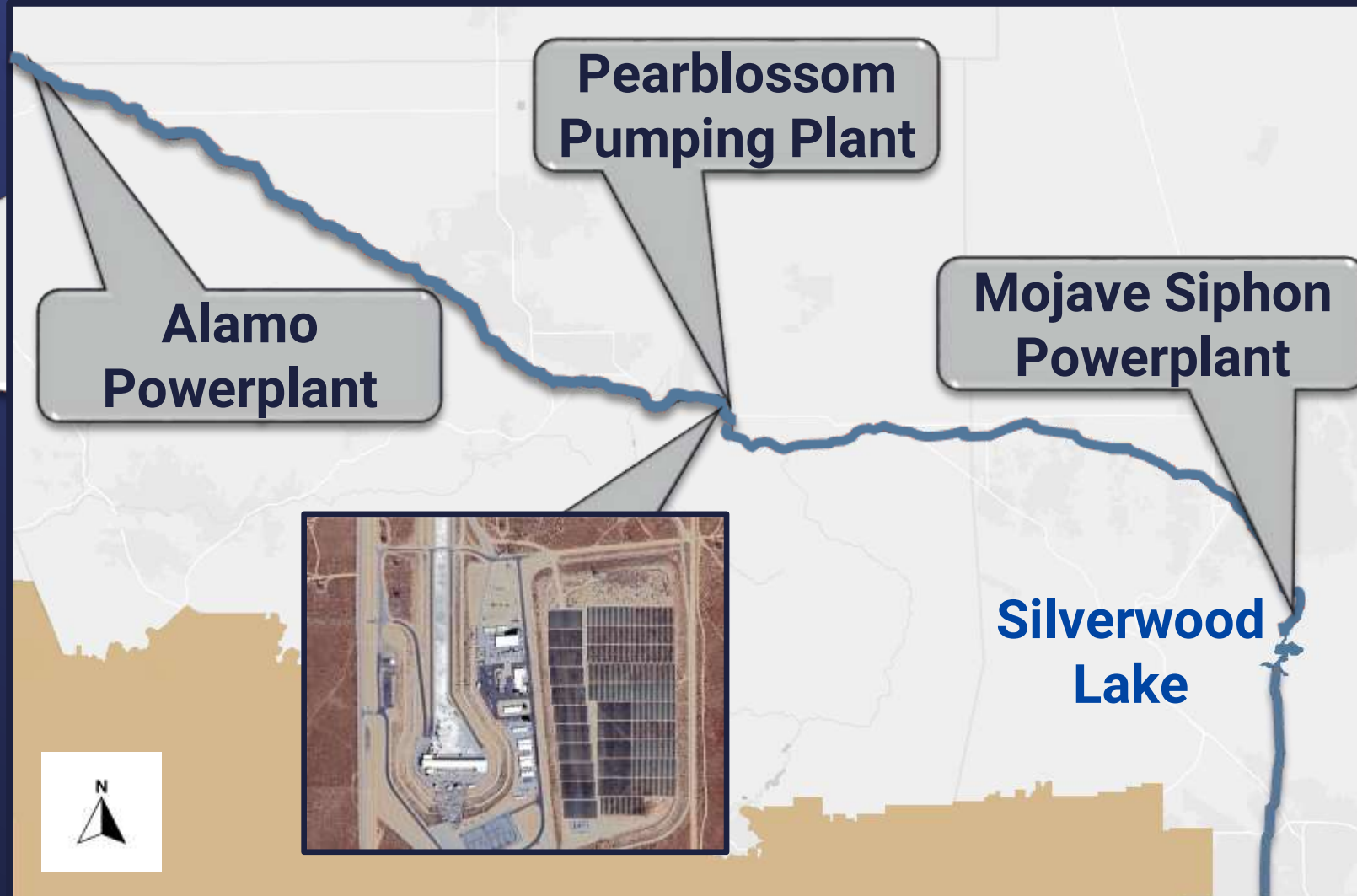
Credit: DWR

\*This is an artistic representation of the dam and not an accurate engineering cross-section

# East Branch of California Aqueduct



# East Branch of the California Aqueduct



- Length: 95 miles
  - Canal: 91 miles
  - Siphons: 4 miles
- Total Capacity: 2,010 cfs
- Metropolitan: 1,675 cfs

# East Branch Capacity



Diamond Valley Lake  
2023 Storage 753 TAF

## 2023 East Branch Operational Conditions

- Existing East Branch infrastructure did not limit 2023 deliveries
- Operational Conditions & Constraints in 2023
  - Managed low demands
  - Shutdowns
  - Limited SWP blending
    - Disinfection byproduct formation
    - Alkalinity of SWP supplies
    - Nitrification
- Operational Constraints were controlling in 2023
  - Net impact: ~60 TAF not delivered within current East Branch capacity

## East Branch Capacity



Pearblossom PP Forebay

## East Branch Capacity Limitations

- East Branch Enlargement
  - Total Capacity: 2,876 cfs
  - \$400 million in 2007 dollars
- Pearblossom Pumping Plant is one element of the East Branch Enlargement
- Other Constraints
  - Raising embankment & concrete liner
  - Replacing road
  - Improving bridges, pipelines, culverts, & siphons
- Phased Improvement Possible

## Improve Reliability

### Next Steps

- Continue to evaluate the need for East Branch Enlargement based on availability of SWP supplies and updated demands
- Evaluate potential preferred alternatives, such as northern storage to improve reliability
- Continue collaboration and consultation with DWR on resilience efforts

