



Engineering, Operations, & Technology Committee

# Metropolitan's Dam Safety Initiatives Program

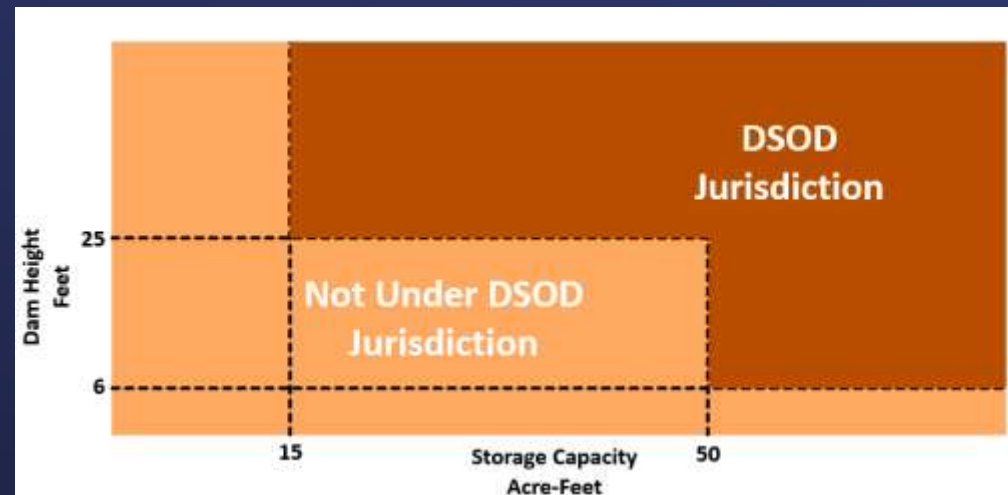
Item 6a

January 9, 2023

# Metropolitan's Dams & Reservoirs

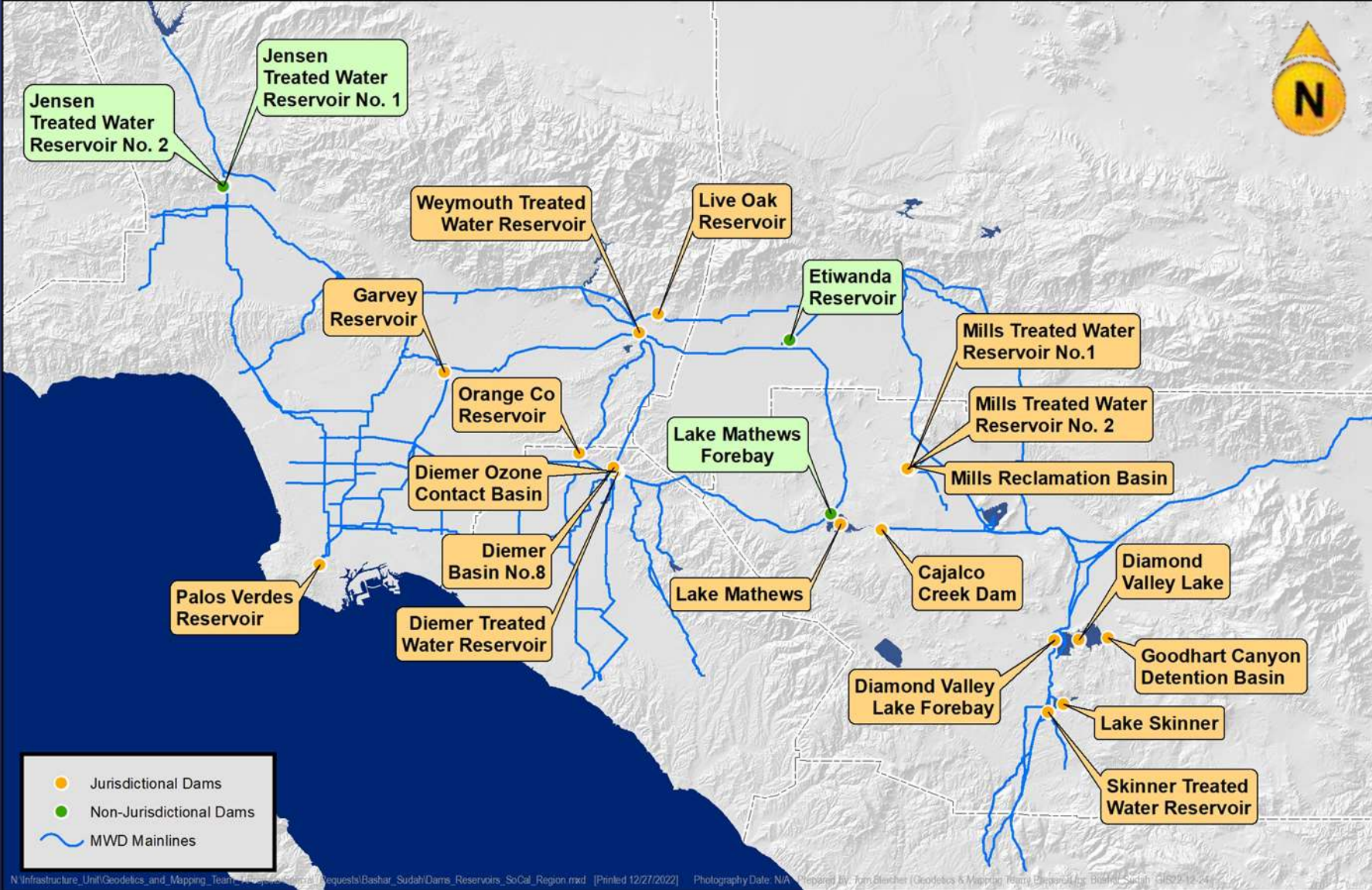
## Overview

- 26 Reservoirs
- 20 Reservoirs under DSOD jurisdiction
  - Two with multiple dams
    - Diamond Valley Lake (3 dams)
    - Lake Mathews (3 dams)
- Includes finished water reservoirs



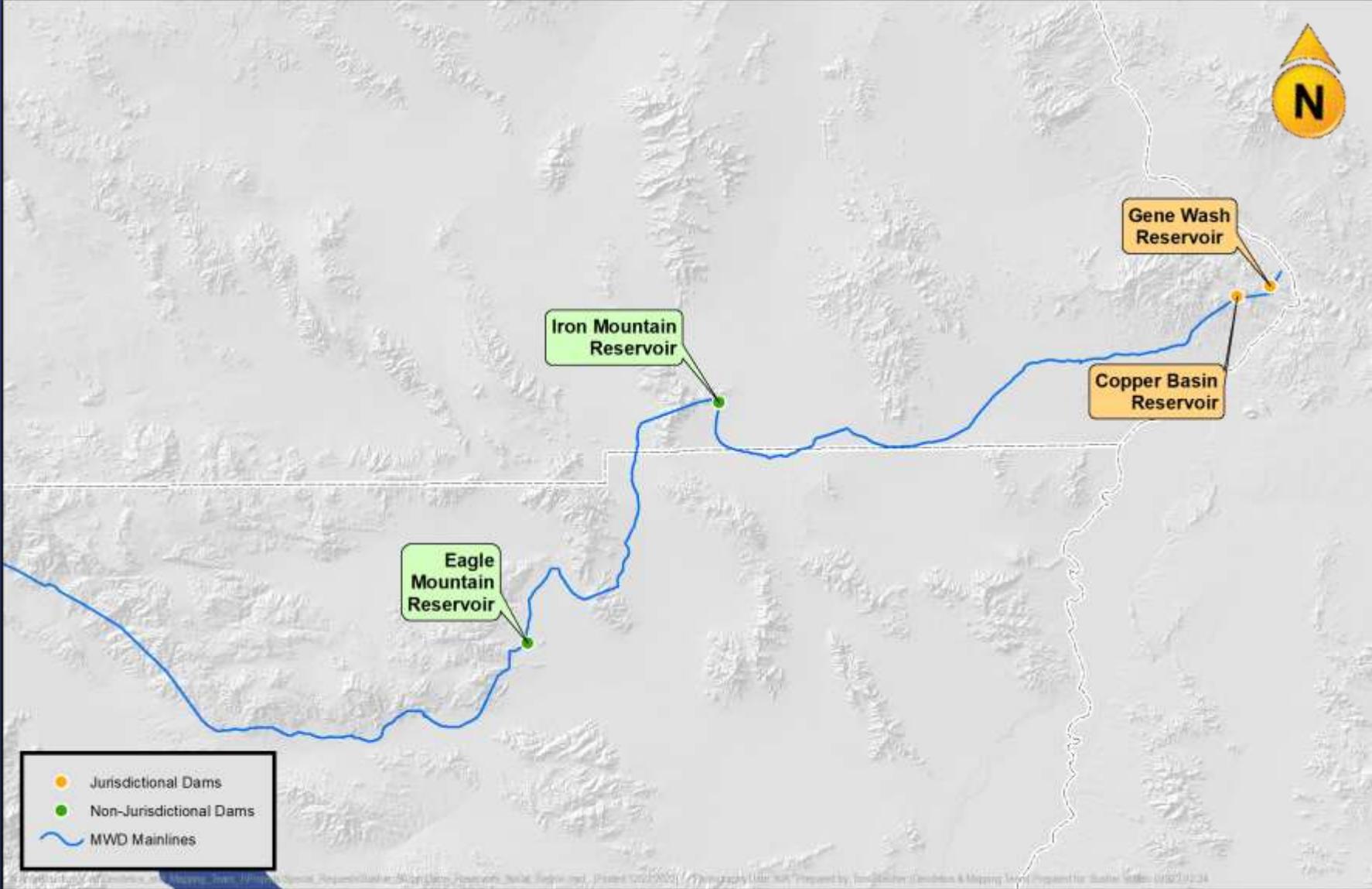
# Reservoir Locations

## Metropolitan's Dams & Reservoirs



# Reservoir Locations

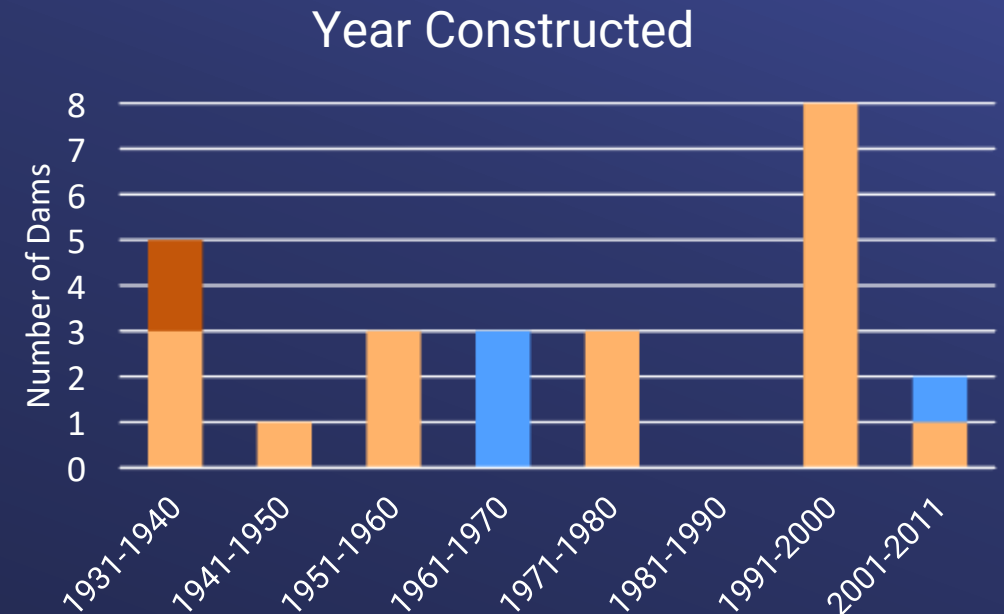
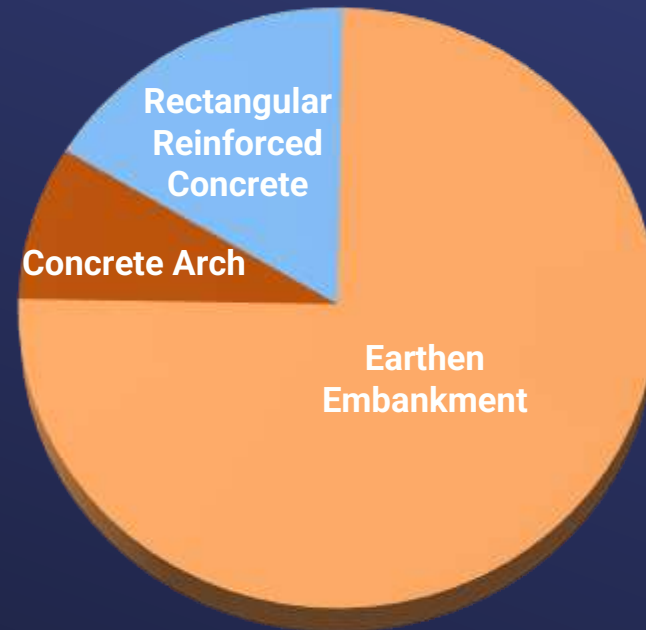
## Metropolitan's Dams & Reservoirs



# Metropolitan's Dams & Reservoirs

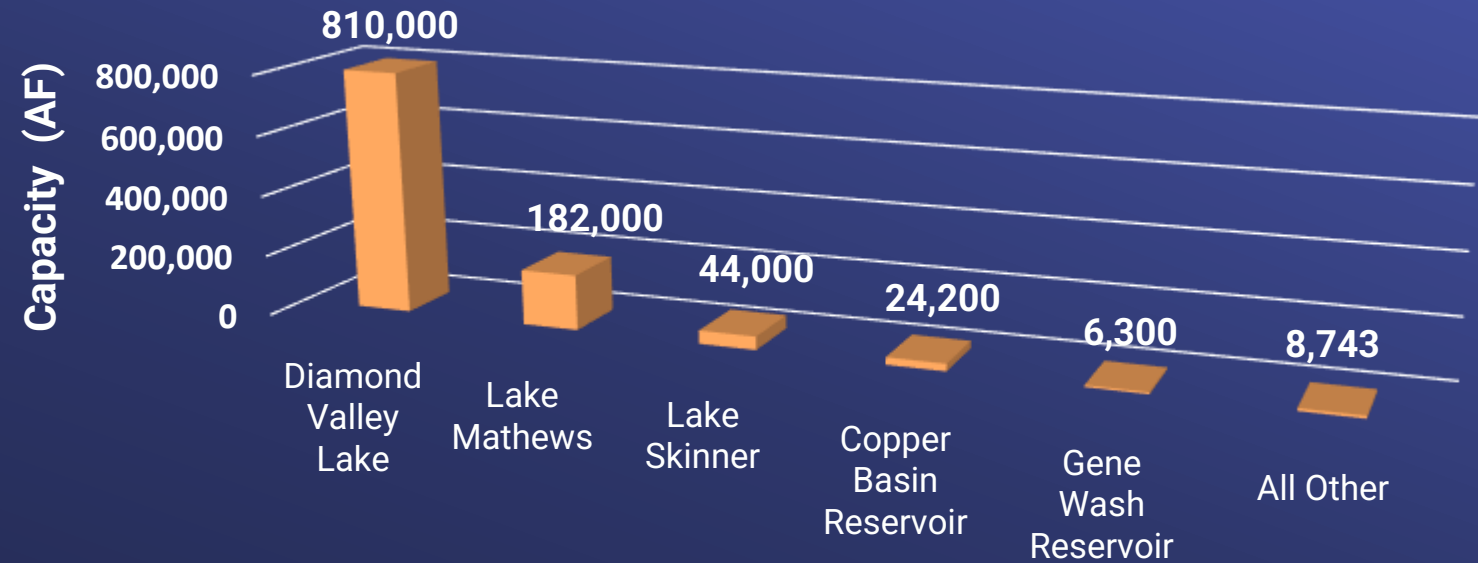
## Jurisdictional Dam Portfolio

- Dam heights range from 15 to 284 feet
- Dam lengths range from 265 to 10,900 feet



# Metropolitan's Dams & Reservoirs

## Reservoir Capacities



Diamond Valley Lake



Diemer Basin No.8

# Metropolitan's Dams & Reservoirs

## Evaporation Losses at Metropolitan's Reservoirs

Water Body	Max Area (Acre)	Max Volume (AF)	Estimated Annual Evap. Loss (AF)
DVL	4,500	810,000	22,383
Lake Mathews	2,750	182,000	9,694
Lake Skinner	1,200	44,423	4,445
Copper Basin	425	24,370	3,054*
Gene Wash	220**	6,300	1,581*
Live Oak	65	2,500	317*
DVL Forebay	40	750	215*
Etiwanda	31	450	152*
CRA	NA	NA	3,000

<b>Total evaporative loss (AF)</b>	<b>44,842</b>
Total maximum reservoir (AF)	1,070,793

Average evaporation as a fraction of total maximum reservoir volume (%)	<b>4%</b>
<b>Annual Evaporative System Loss (%)</b>	<b>2%</b>

\*Estimation assumes that the reservoir remained at maximum pool throughout the year (possible overestimation)

\*\*Estimated from capacity curve

## Metropolitan's Dams & Reservoirs

# Dam Safety Regulations Updates

- Spillway comprehensive assessments
  - Lake Mathews and Lake Skinner
- California Senate Bill 92 in June 2017
  - Inundation Maps
  - Emergency Action Plans



Lake Skinner Spillway

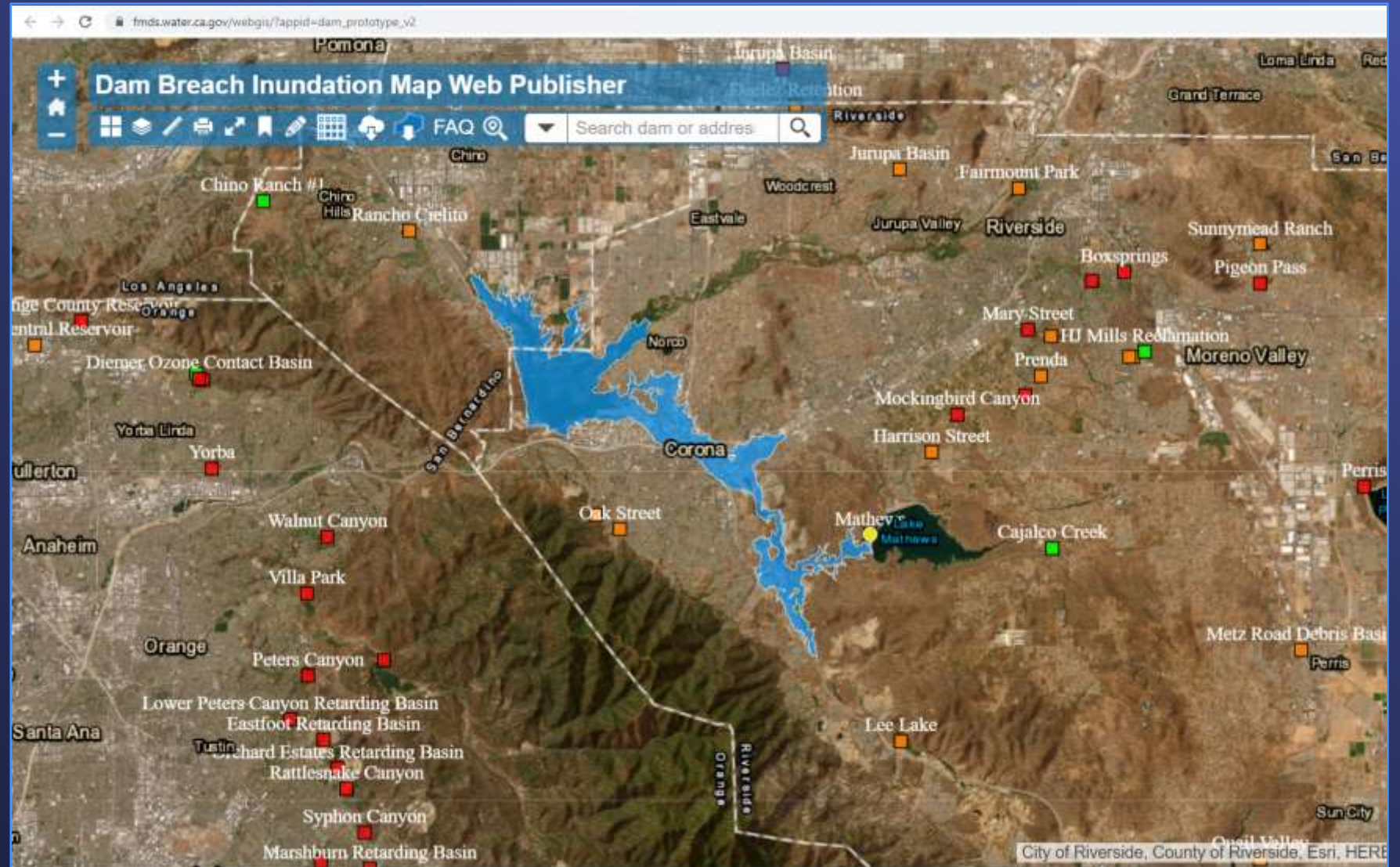


Lake Skinner Spillway GPR Testing



# Inundation Maps - Lake Mathews Example

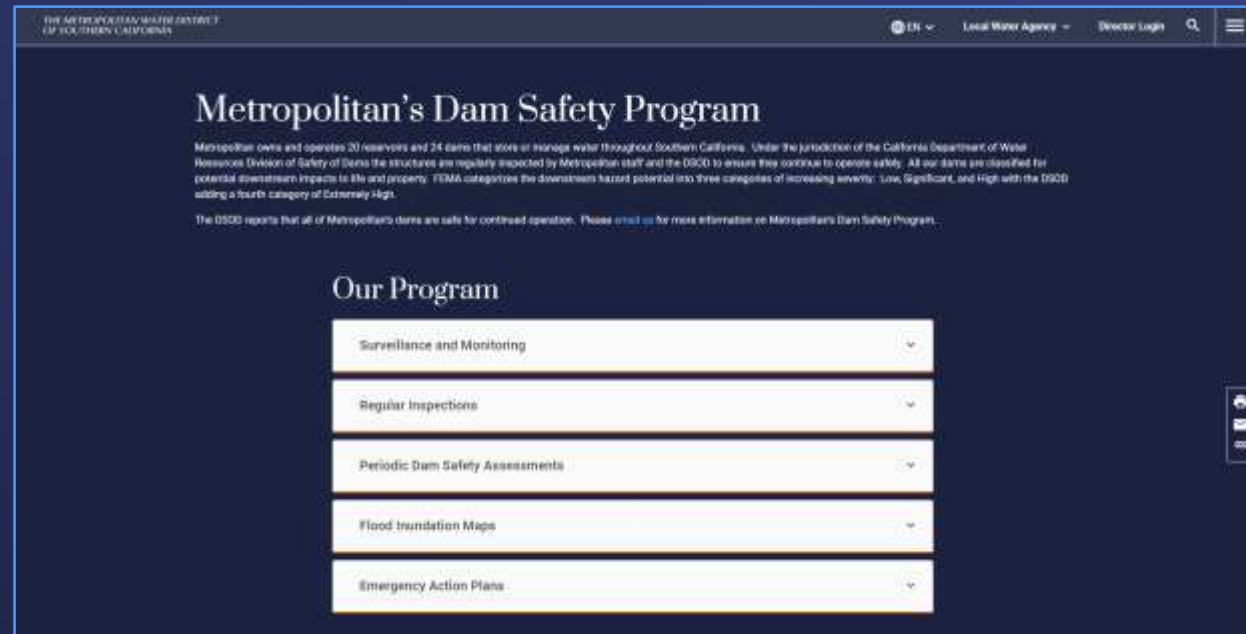
## Metropolitan's Dams & Reservoirs



# Metropolitan's Dams & Reservoirs

## Emergency Action Plans (EAPs)

- Coordination with the Cal OES
- Update EAPs to new Cal OES format
- Outreach to local emergency agencies
- Complete all EAP updates by 2024

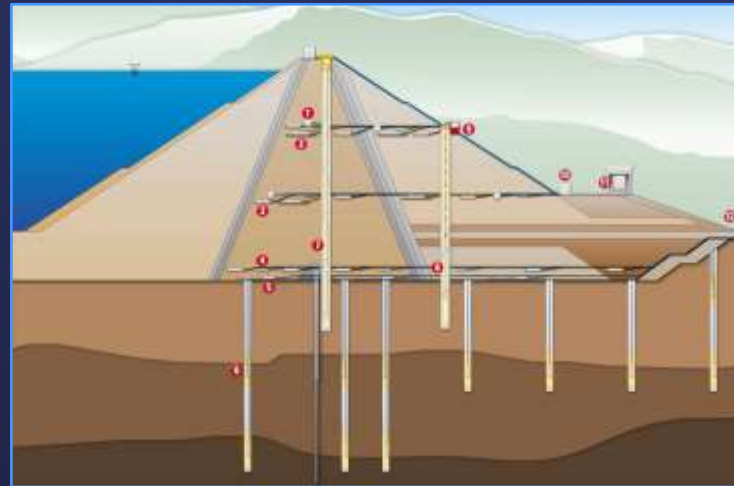


<https://www.mwdh2o.com/how-we-plan/>

# Metropolitan's Dams & Reservoirs

## Inspection & Monitoring

- Visual Inspections
  - Three Levels of Inspection:
    - 1 – by MWD staff in the presence of DSOD inspectors
    - 2 – by MWD staff on monthly, quarterly or semi-annually
    - 3 – by MWD staff conducted on routine daily or weekly
- Monitoring Instrumentation



Typical Dam Instrumentation Section



DVL Seepage Monitoring Station

## Metropolitan's Dams & Reservoirs

### Dam Safety Assessments

- Evaluate performance of dams & appurtenances
- Mandated by DSOD or initiated by staff
- Completed in-house or by consultants
- Identify necessary improvements



Copper Basin Dam

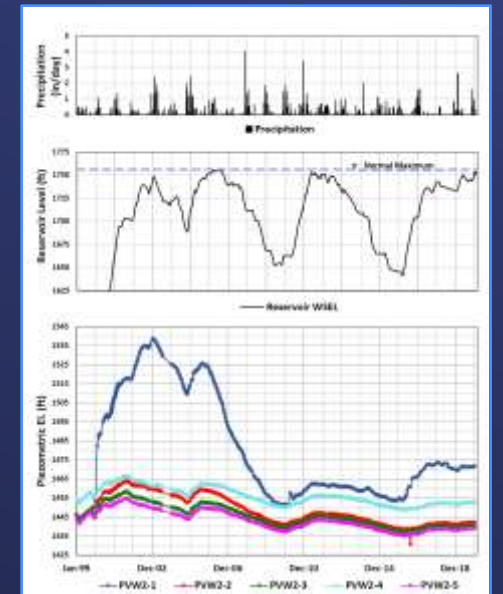
## Metropolitan's Dams & Reservoirs

### Dam Safety Initiatives

- Dam monitoring system upgrades
  - Technology scan – Isle Utilities
  - RFQ 1318 identified qualified service providers
  - Instrumentation & data acquisition
  - Data management & dashboarding
- Planned board action - April 2023



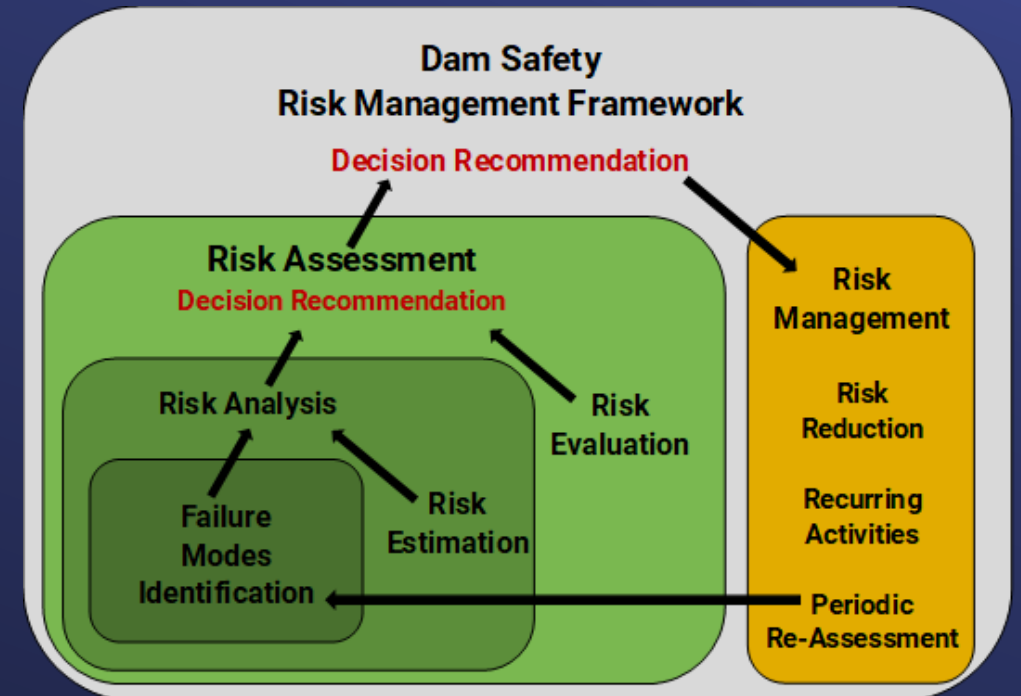
DVL Remote Monitoring Unit



# Metropolitan's Dams & Reservoirs

## Dam Safety Initiatives

- Dam Risk Assessments
  - Identify potential failure modes
  - Estimate risk
  - Identify risk reduction measures



## Metropolitan's Dams & Reservoirs

### Summary

- Planned board action for dam monitoring systems in mid-2023
- Begin Dam Risk Assessments in 2023
- Continue work on EAPs, with completion by 2024
- Continue routine dam monitoring and reporting

