Dam Safety Program Annual Report

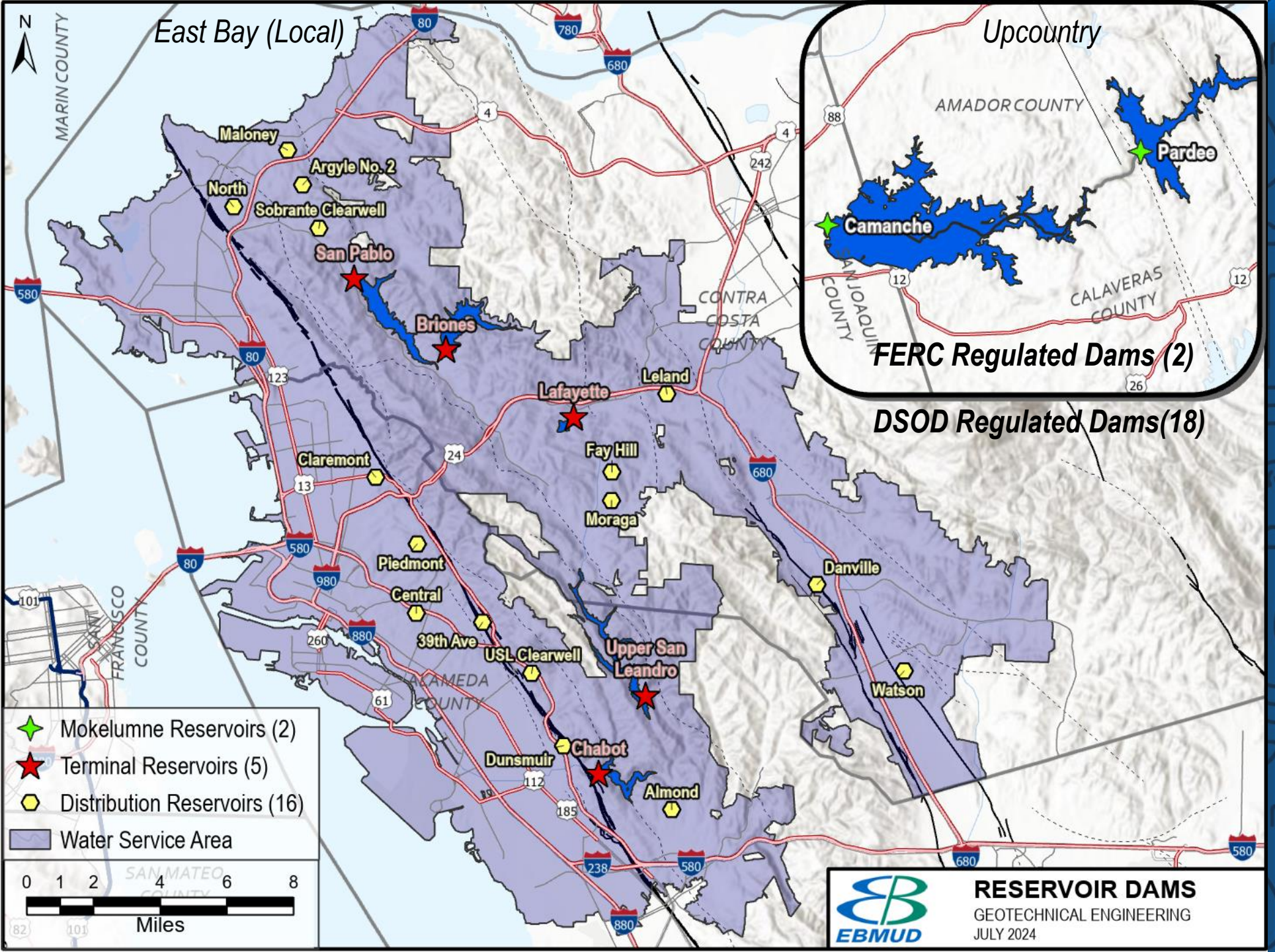
Planning Committee

August 13, 2024

Outline

- Inspection, Surveillance and Reporting
- Emergency Response and Preparedness
- Studies and Improvements
- Upcoming Activities
- Summary and Next Steps

Pardee Dam and Reservoir



District Dams

Inspection, Surveillance, and Reporting

- Monthly inspections of all dams
- Annual inspection & surveillance reports submitted to regulatory agencies

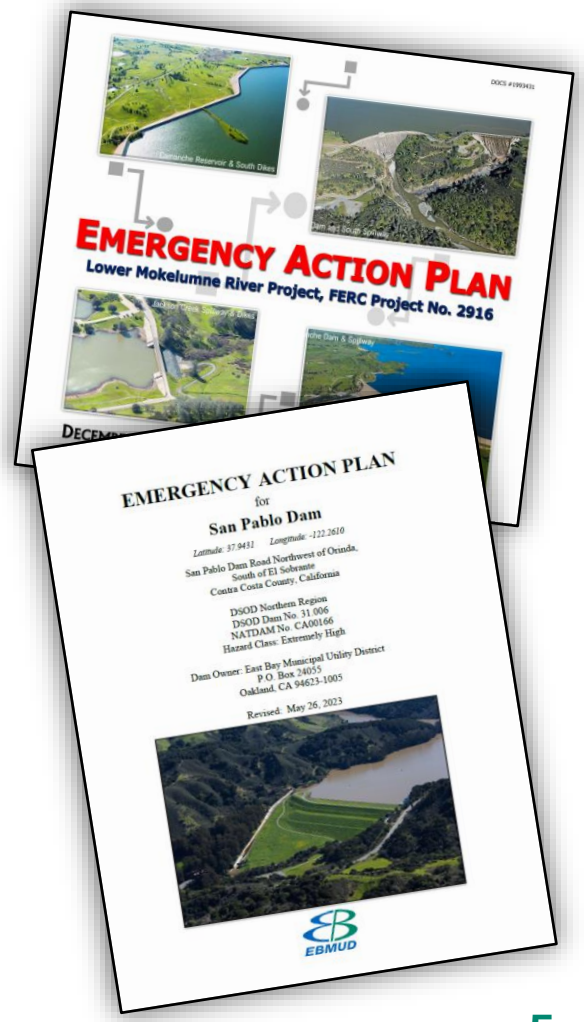
All District dams are considered safe for continued operations


Pardee Dam


Camanche Dam

Emergency Response & Preparedness

- Annual FERC EAP Seminar, Tabletop Exercise, and Functional Exercise – September 20, 2023
- Participated in Contra Cost County Emergency Operations Center Functional Exercise – May 2, 2024
- Updated Earthquake Annex to the EOP – June 2024
- All Local Reservoir EAPs have been updated:
  - Terminal Reservoir EAPs approved by CalOES
  - Open-Cut Reservoir EAPs
    - June 2024: CalOES approved six of ten EAPs
    - The remaining four EAPs are being reviewed by CalOES



FERC = Federal Energy Regulatory Commission; EAP = Emergency Action Plan; EOP = Emergency Operations Plan; CalOES = California Governor's Office of Emergency Services

Completing Dam and Tower Seismic Upgrades

- San Pablo Dam Seismic Upgrades (completed in 2010)
- Chabot Dam Seismic Upgrade (completed in 2017)
- Upper San Leandro Reservoir Tower Upgrade (completed in 2018)
- Briones Outlet Tower Seismic Upgrade (completed in 2024)
- Lafayette Tower and Conduit Seismic Safety Project (in progress)

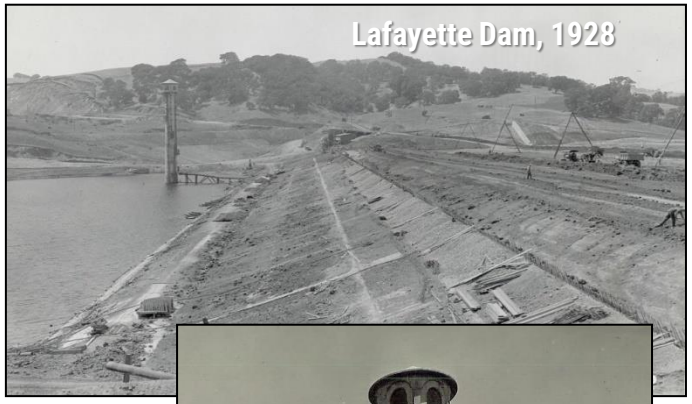

San Pablo Dam

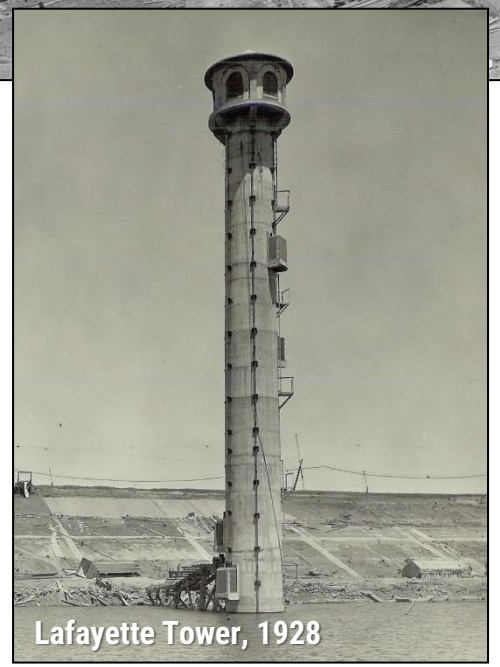

Chabot Dam

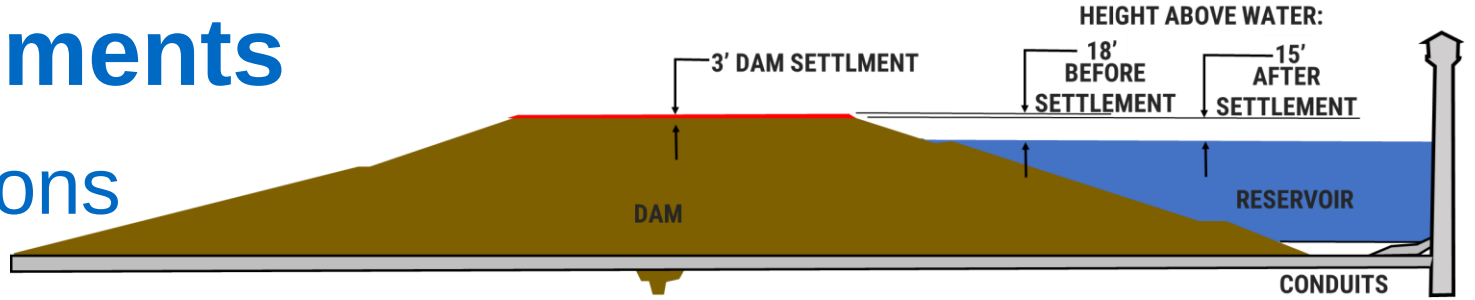

Upper San Leandro Tower

Studies and Improvements

Lafayette Tower Modifications







Cross Section of Lafayette Dam, Conduits, Reservoir, and Tower

- The tower is a critical component for dam safety, and serves both as the spillway and outlet to control reservoir levels
- Although studies have shown that the dam is safe, the tower and its associated conduits are vulnerable during an earthquake and retrofit is required. Debris falling in the tower could prevent the reservoir from lowering, tower cracking could cause unplanned reservoir draining, and conduit damage could wash out soil and cause dam failure
- DSOD rated the facility as “fair” and mandated tower upgrades. Proposal is to reduce height by 40 feet

District Memo:
Concrete Infill,
Steel- or Concrete Jacket
1995

Letter to DSOD:
Concrete Infill
2002

Letter from DSOD:
Recommend Shortening
2011

Letter from DSOD:
Recommend Shortening
2015

AECOM Report:
Evaluate Previous Alternatives
Recommend Shortening
2019

International Civil Engineering Consultants Report:
Recommend Not Shortening
1995

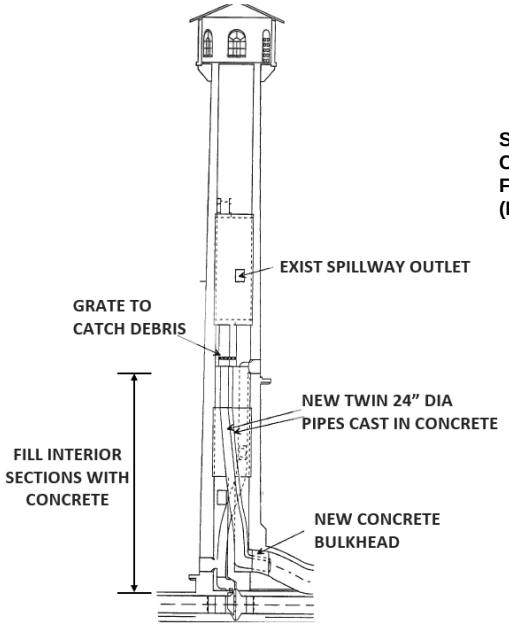
Letter to DSOD:
Concrete Infill Revisions
2004

McMillen Jacobs Associates Report:
Steel-, Concrete-, and Fiber Jacket;
Post Tensioning, Maintain Tower
2014 - 2016

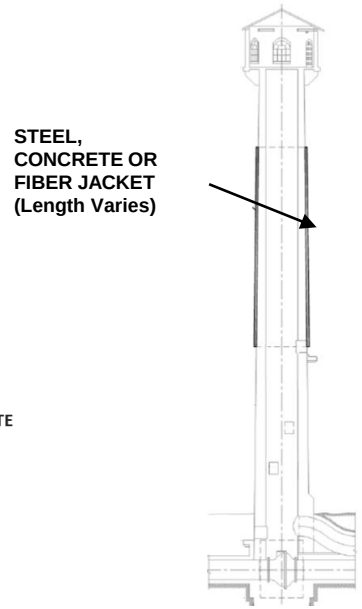
Terra/COWI Report:
Base Isolators
2017

Committee Memo:
Top-Half Reinforcement
2023

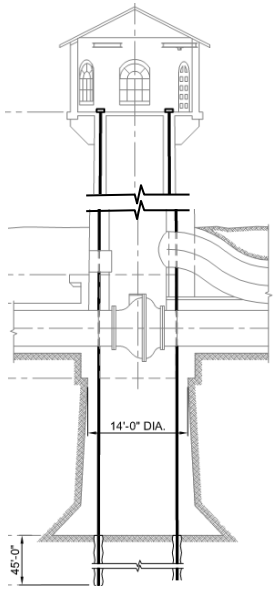
Extensive expert input throughout process



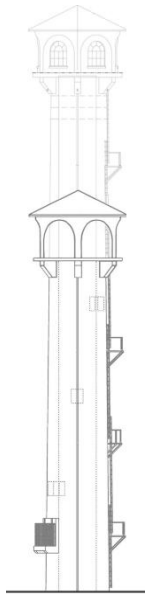
CONCRETE INFILL



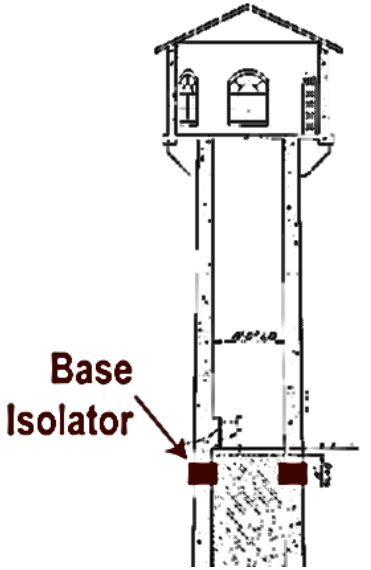
JACKET/ WRAPPING



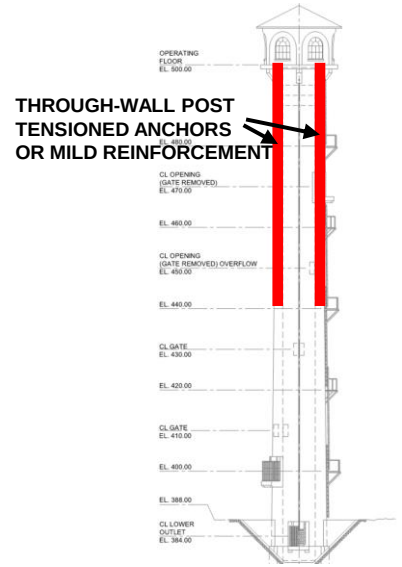
POST TENSIONED ANCHORS



SHORTENED TOWER



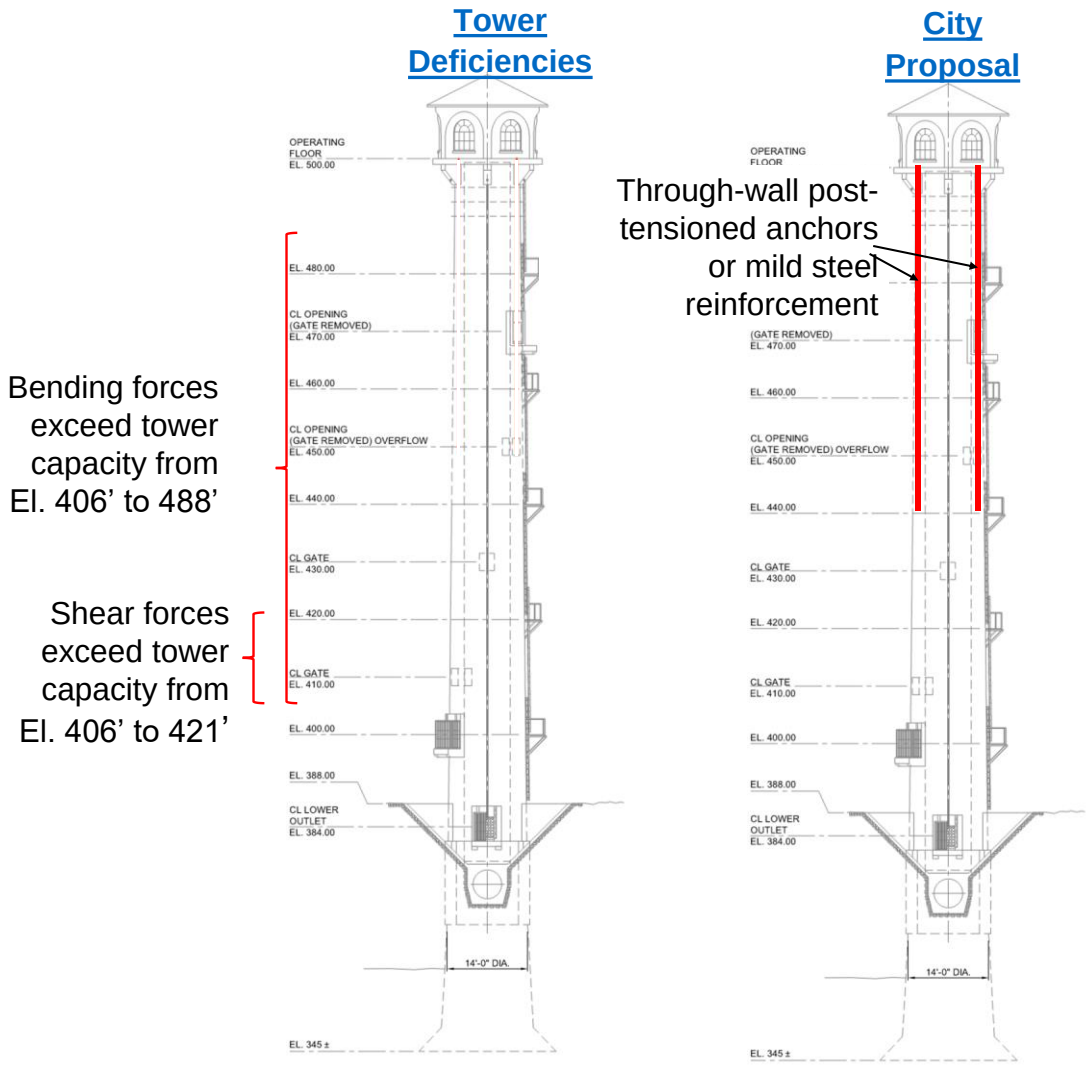
BASE ISOLATOR



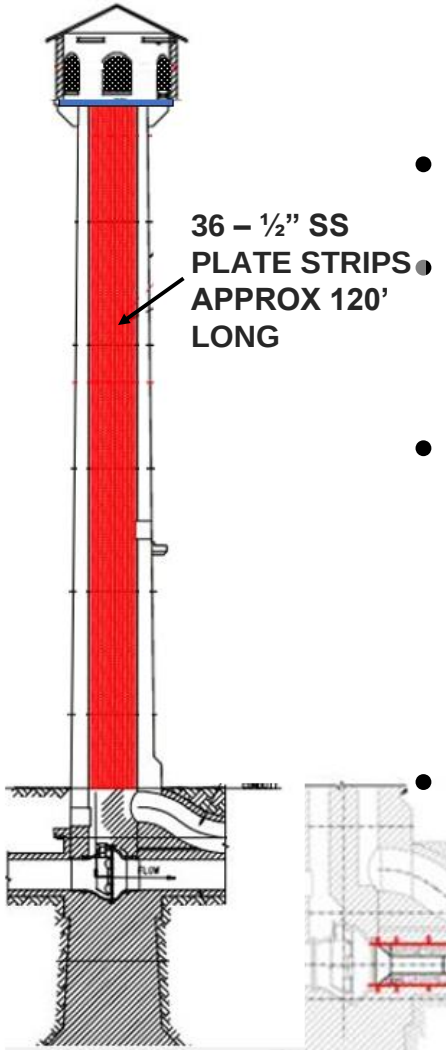
COMMITTEE MEMO: REINFORCE TOP-HALF

City of Lafayette Technical Collaboration

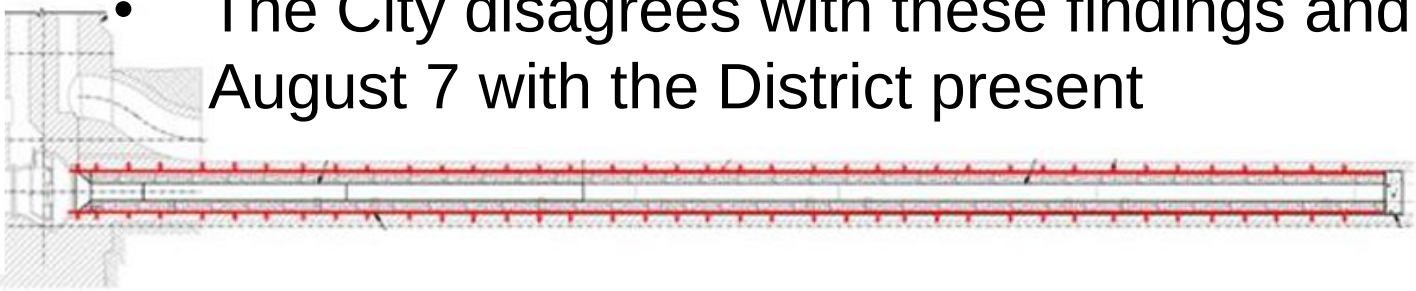
- The City proposed that a tall tower could be maintained by only reinforcing the top of the tower
- The District evaluated the City's proposal, unfortunately:
  - It does not provide adequate shear capacity in lower portion of the tower under seismic loading
  - It imparts additional loading on the conduit, necessitating significantly larger conduit retrofit over what is required for shortened tower
- Discussed with City in November 2023
- This alternative is not recommended



City of Lafayette Technical Collaboration (Continued)

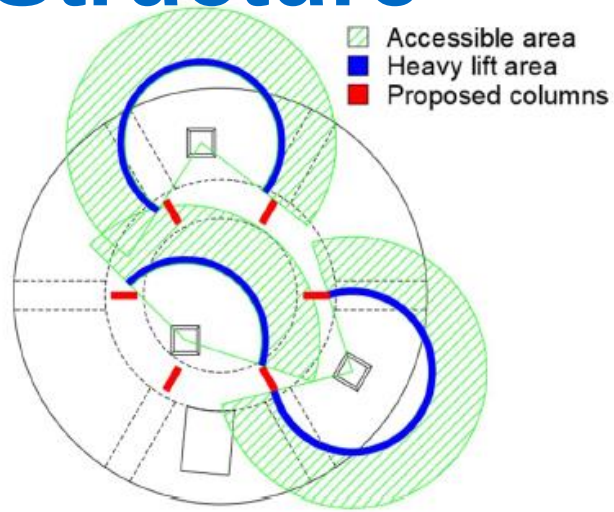


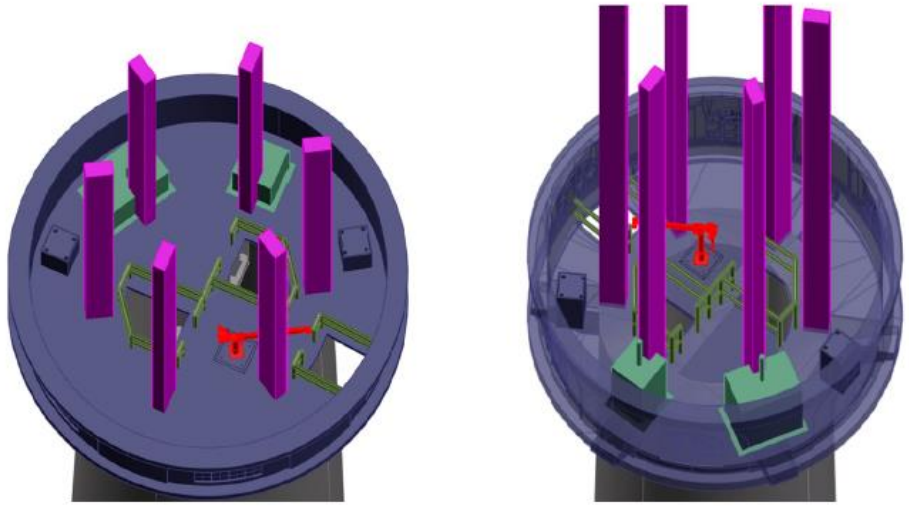
- The District considered what it would take to make the City's alternative work and has discussed these results with the City
- Full tower reinforcement would be required
- Due to significantly higher loads within the conduit, a more significant conduit retrofit would be needed
- This alternative presents higher constructability risks, does not improve operations, would rely on additional infrastructure components, and would be significantly more costly. Therefore, it is not recommended
- The City disagrees with these findings and met with DSOD on August 7 with the District present



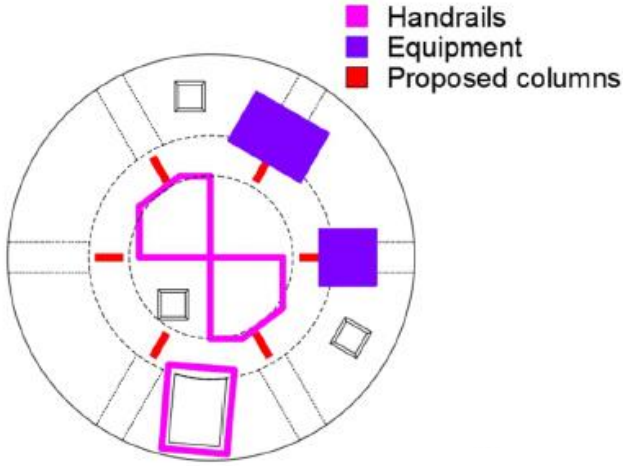
Community Proposal: 55-Foot-Tall Steel Structure

- Suggestion from residents to maintain tower height
- Steel structure increases base shear
- Control platform still needed. The required columns would impede maintenance access and crane function
- This alternative is not recommended





Community Proposal – Column Locations on Platform

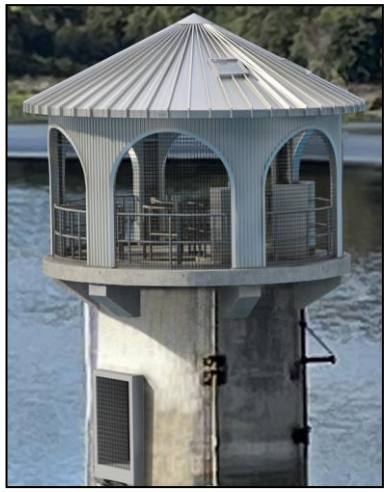


Community Proposal –
Column Interference with Equipment

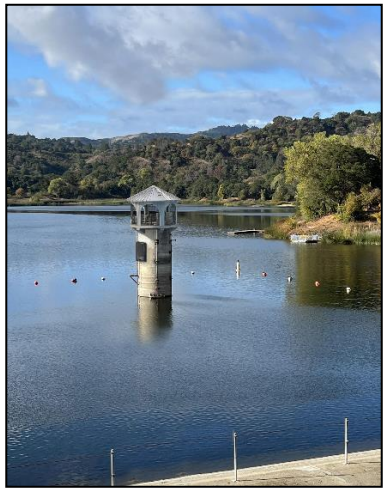
Alternate Community Proposal: Lightweight Metal Operating House

Existing

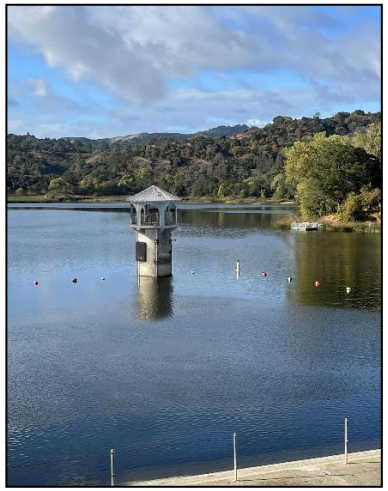
Parapet



Metal Operating House

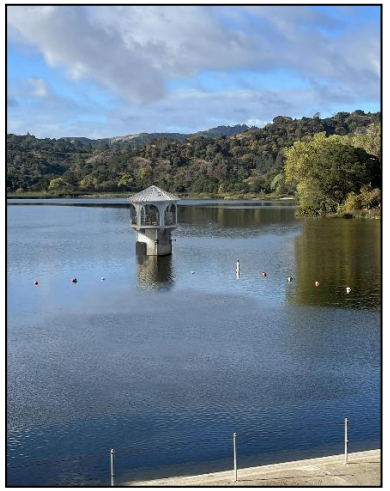


Reservoir El. 433



Reservoir El. 440

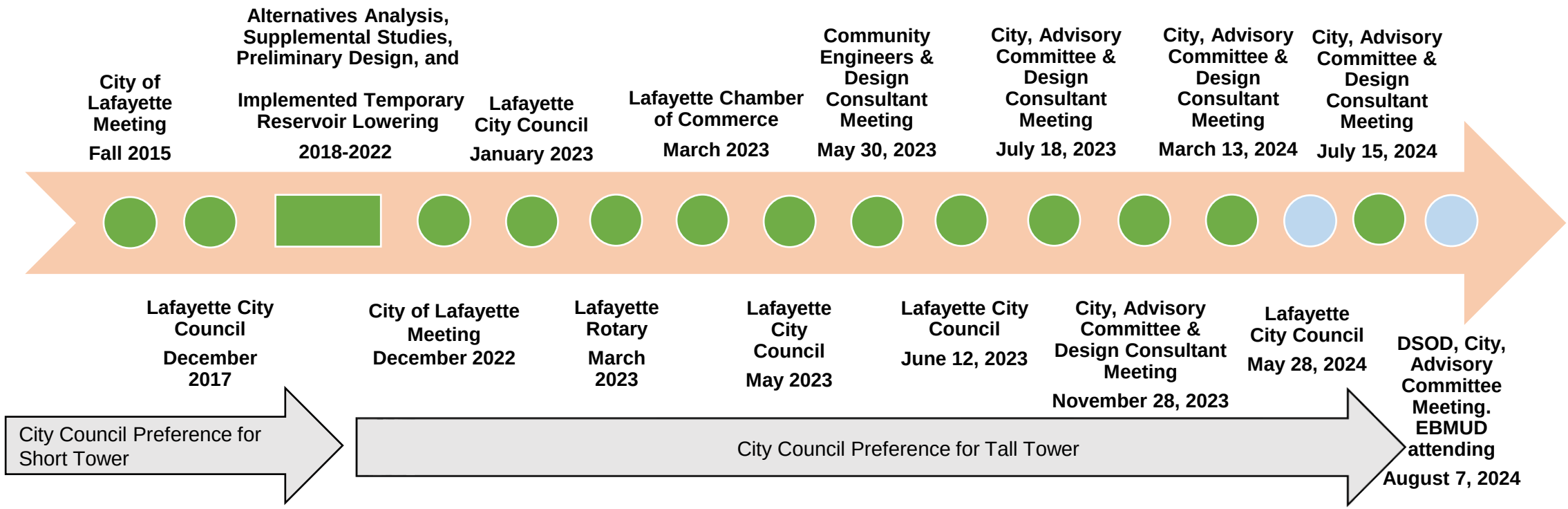
(Current operating reservoir restriction)



Reservoir El. 449

(Full)

Timeline of Interactions with City of Lafayette



LEGEND

- **Meetings where EBMUD attended and presented**
- **Meetings where EBMUD attended but did not present**

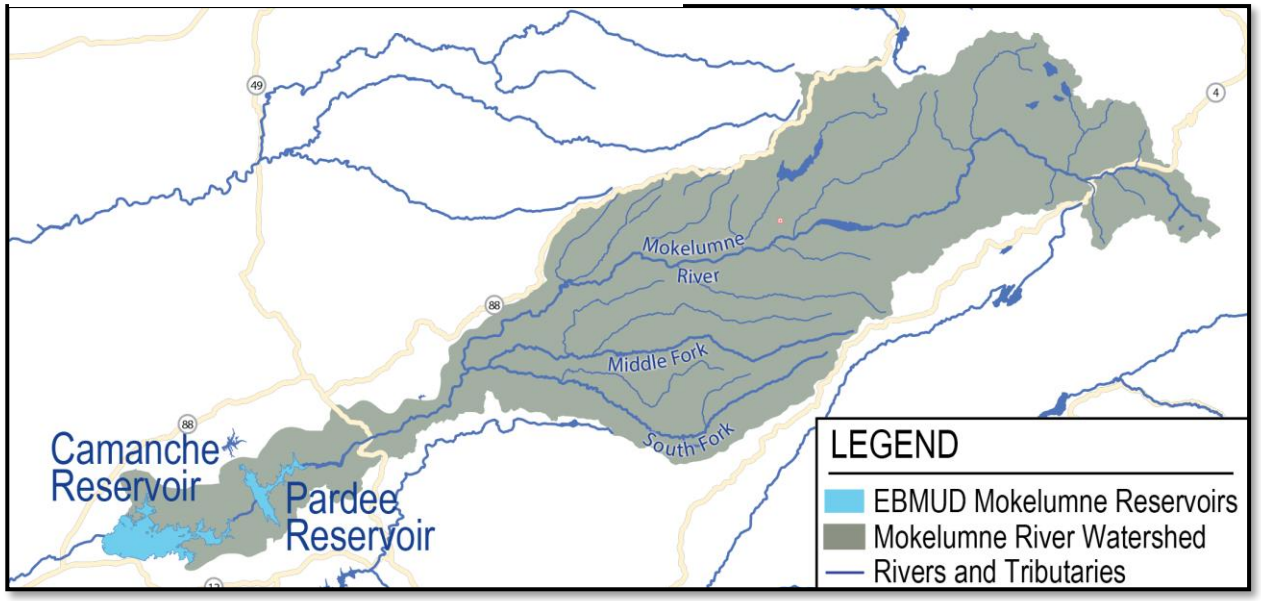
- District is proceeding with design of the DSOD-approved shortened tower, with a lightweight metal operating house based on community input. Continued public outreach planned.
- Construction planned for 2025.

Studies and Improvements -
Probable Maximum Flood Studies

UPCOUNTRY RESERVOIRS

- Site specific probable maximum precipitation study for Mokelumne River watershed
- Joint Effort and Collaboration with PG&E
- Meeting to be held later this summer between the District, PG&E, and FERC

Mokelumne River Watershed Map

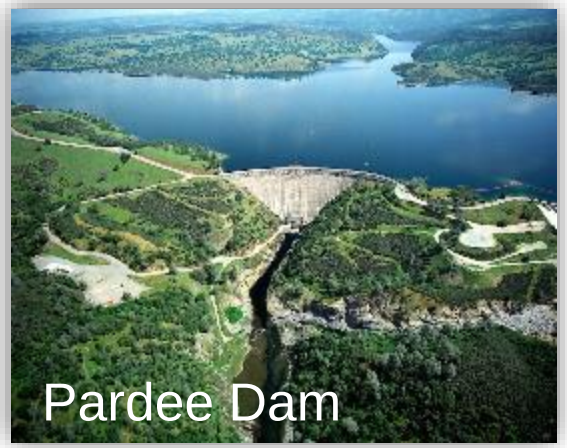


LOCAL RESERVOIRS

- Develop San Leandro watershed hydrometeorological model
- Incorporate climate change impacts
- Perform site-specific probable maximum flood and probabilistic-flood assessments

Upcoming Activities

- Continue ongoing emergency action planning, dam safety monitoring, maintenance and capital efforts
- Complete Lafayette Tower Modifications
- Complete the Camanche and Pardee Seismic Study
- Continue with the Spillway Condition Assessments at the Terminal and Upcountry Dams
- Begin USL and Chabot Watershed Flood Studies and Spillway Evaluations and Continue Upcountry Probable Maximum Flood Studies with PG&E
- Continue upcountry and local reservoir Surveillance Improvement Programs
- Schedule new sessions for the Dam Safety Training Program
- Advance dam safety research proposals with the UC Berkeley's Center for Smart Infrastructure (CSI)


Pardee Dam


USL Blowoff

Questions?

FLOWING
INTO
THE
FUTURE

Los Vaqueros Reservoir Expansion Updates

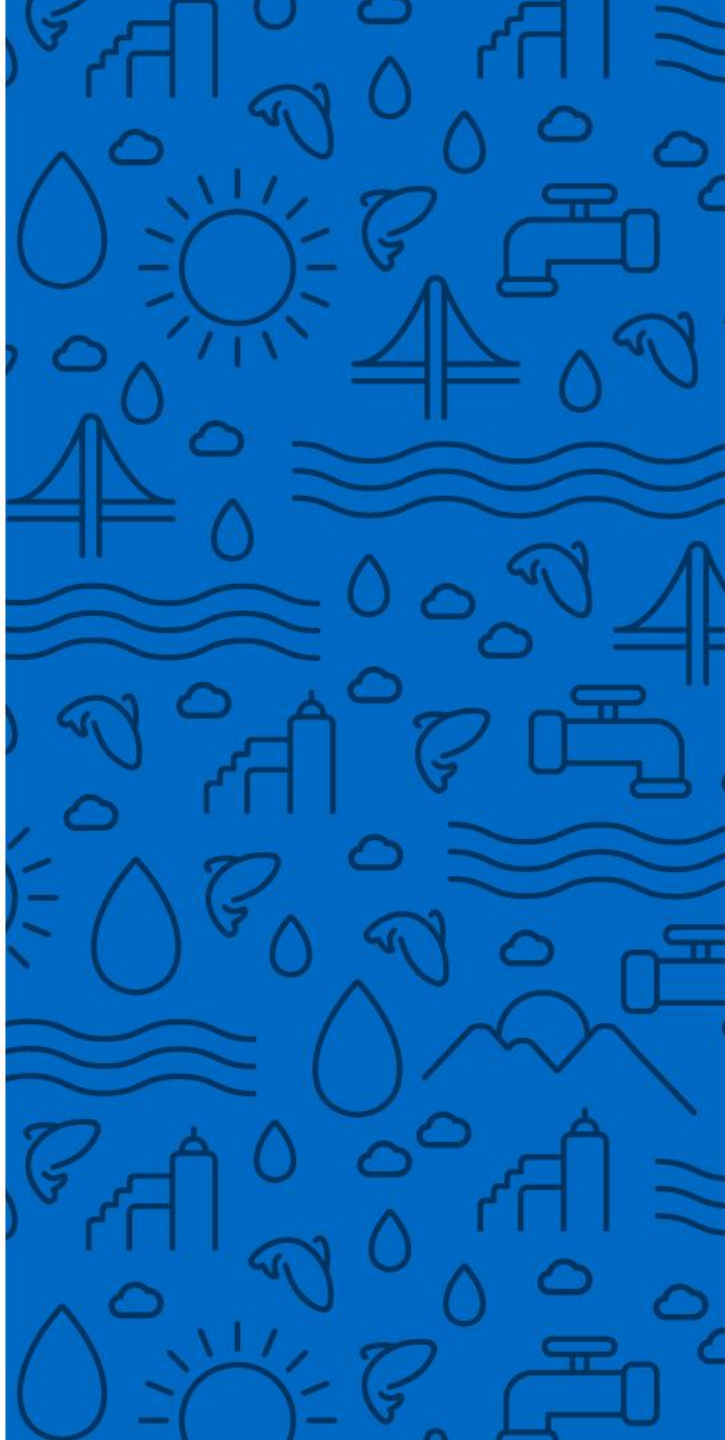
Planning Committee

August 13, 2024

Agenda

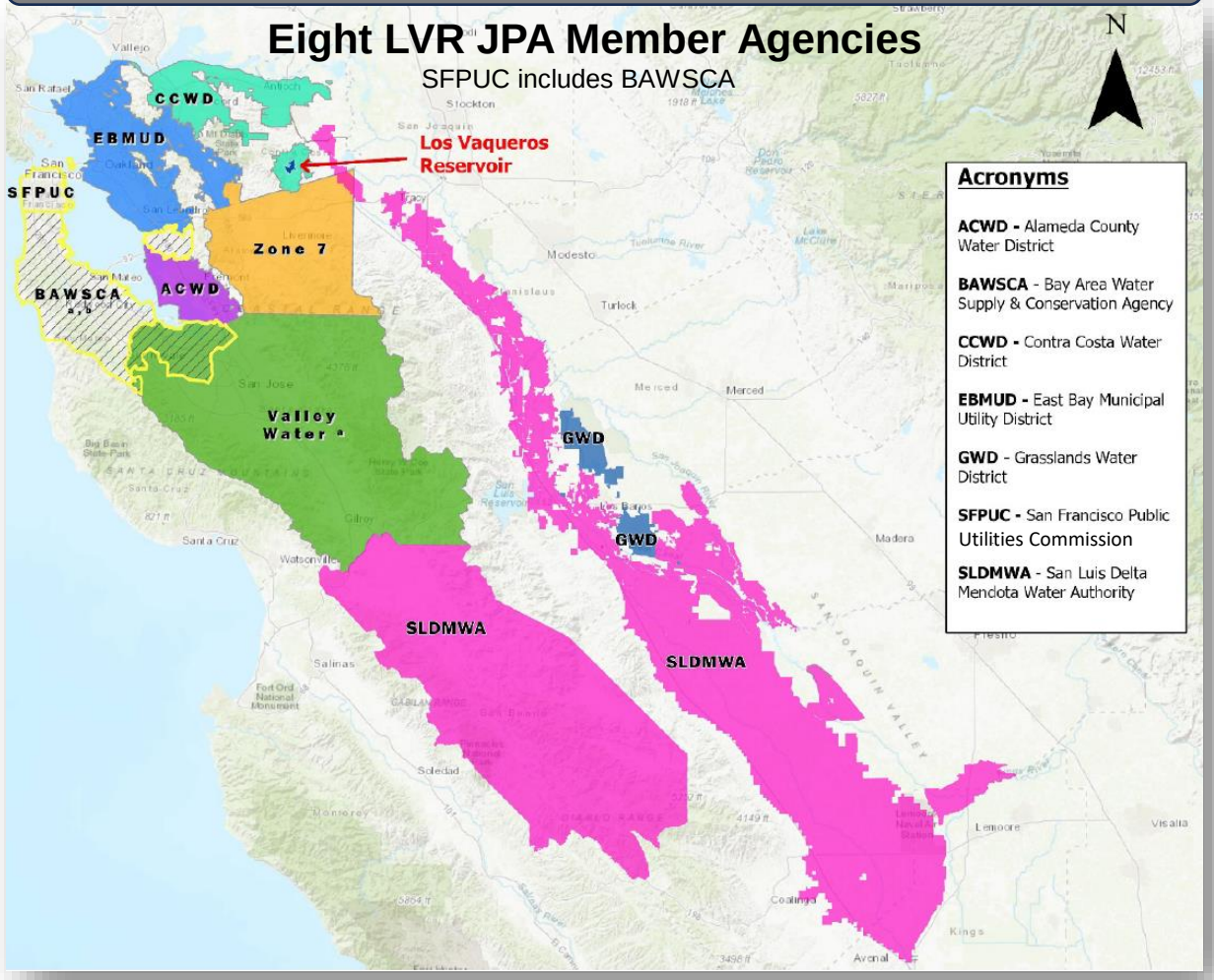
- Los Vaqueros Expansion (LVE) Background
- Supplemental Water Supply Need, Alternatives, Dry Year Unit Costs, and Project Agreement Status
- LVE Project Participation Options and Recommendations

LVE Background



Background

LVE Project: Increase capacity from 160 TAF to 275 TAF



Potential Project Benefits for the District

- Up to 30 TAF dedicated storage west of Delta
- Supply for droughts and emergencies
- $24 million grant for facility upgrade
- Recovery of Freeport sunk costs
- Ability to use CCWD intakes
- Regional water supply benefits

Ecosystem Benefits

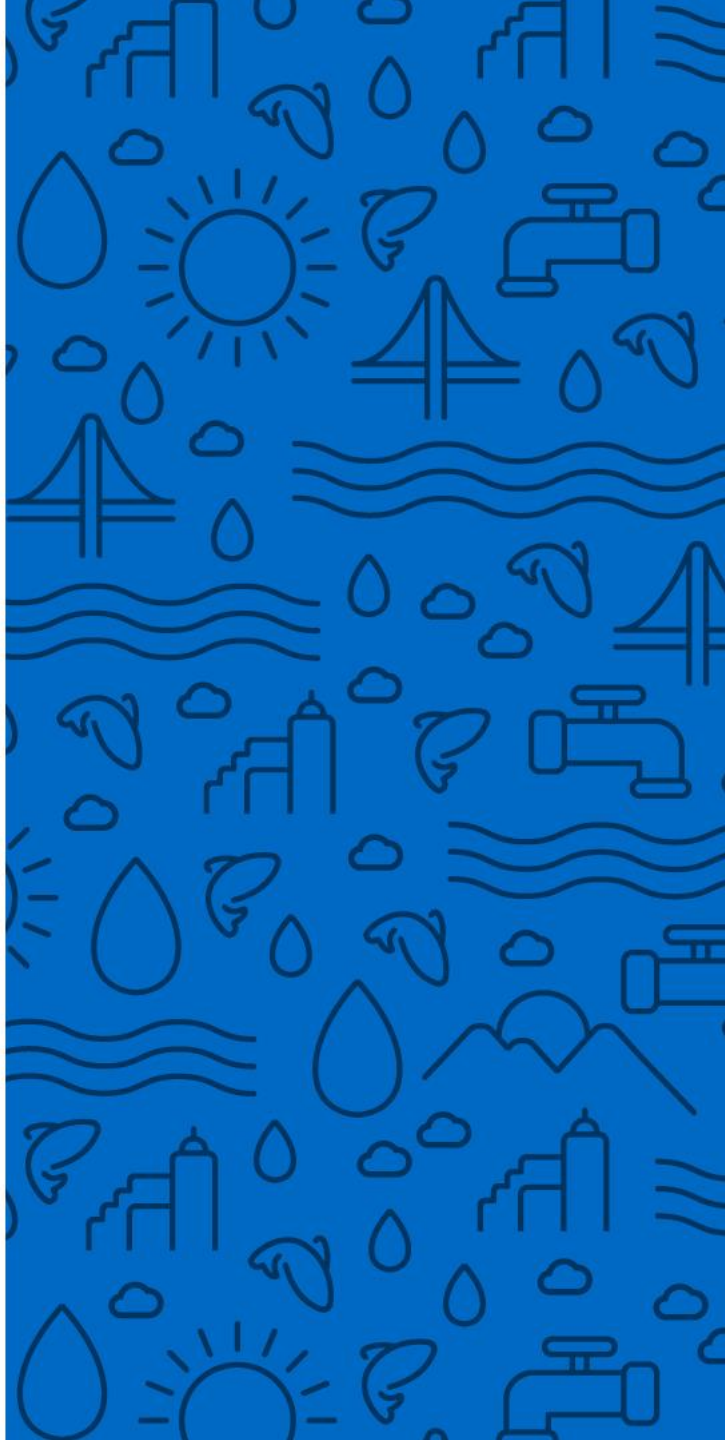
- Improves water supply for wildlife refuges by addressing unmet mandate
- Provides storage access to optimize delivery of water supplies
- Rehabilitates lost wildlife refuges by adding ~9,000 acres of wetlands
- Supports 14 shorebird species nearing extinction
- Improves survival of salmonids migrating through Delta

JPA: Joint Powers Authority
LVR: Los Vaqueros Reservoir
TAF: thousand acre-feet

JPA Member Agencies Status and Storage Requests

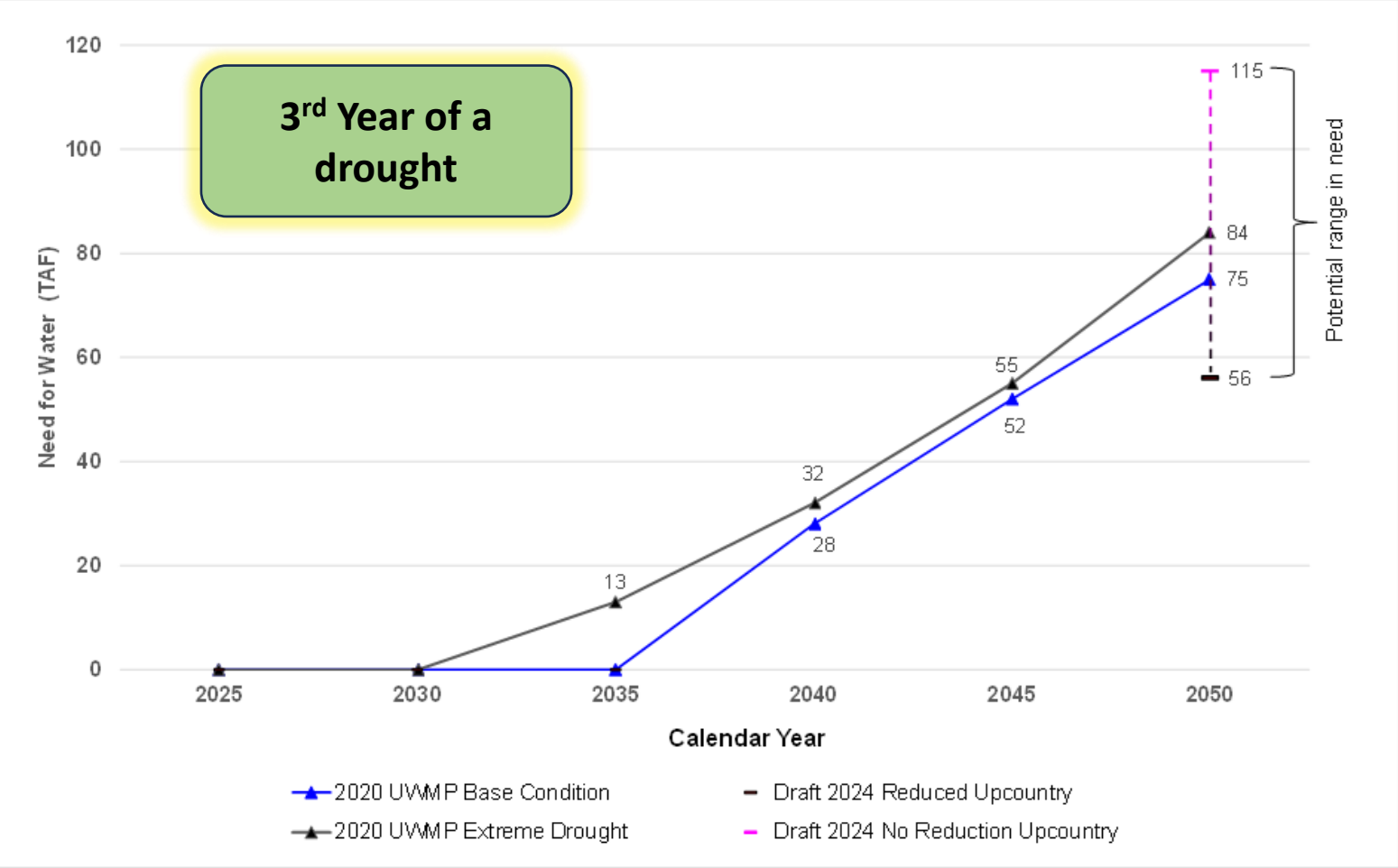
Member Agency	Status	Potential Storage Request (TAF)
ACWD	Updated its Board on business case to date (not yet final) on August 8	10
CCWD	Staff to develop options on LVE based on member agencies' responses to its policy questions and discuss with its Board on September 18	0
EBMUD	Planning to go to its full Board on August 27 with business case	Up to 30
Grasslands	Providing project updates to its Board, but business case has not been scheduled	10
SFPUC	Providing project updates to its Commission, but business case has not been scheduled	20
SLDMWA	Providing project updates to its Board, but business case has not been scheduled	15
Valley Water	Planning to go to its full Board on September 10 with business case	30
Zone 7	Discussed LVE conveyance with its full Board on August 7, but business case has not been scheduled	10

Supplemental Water Supply Need, Alternatives, Dry Year Unit Costs, and Project Agreement Status



Need for Water

2020 UWMP and Draft 2024 Update



- Accounts for conservation, recycling, and 15% rationing
- Draft 2024 update:
  - Reduced District demands
  - Reduced CVP supply based on recent allocations
  - Accounts for upcountry demand uncertainty with 2 scenarios: with and without reduced demands
  - Will be refined as the 2025 UWMP is developed

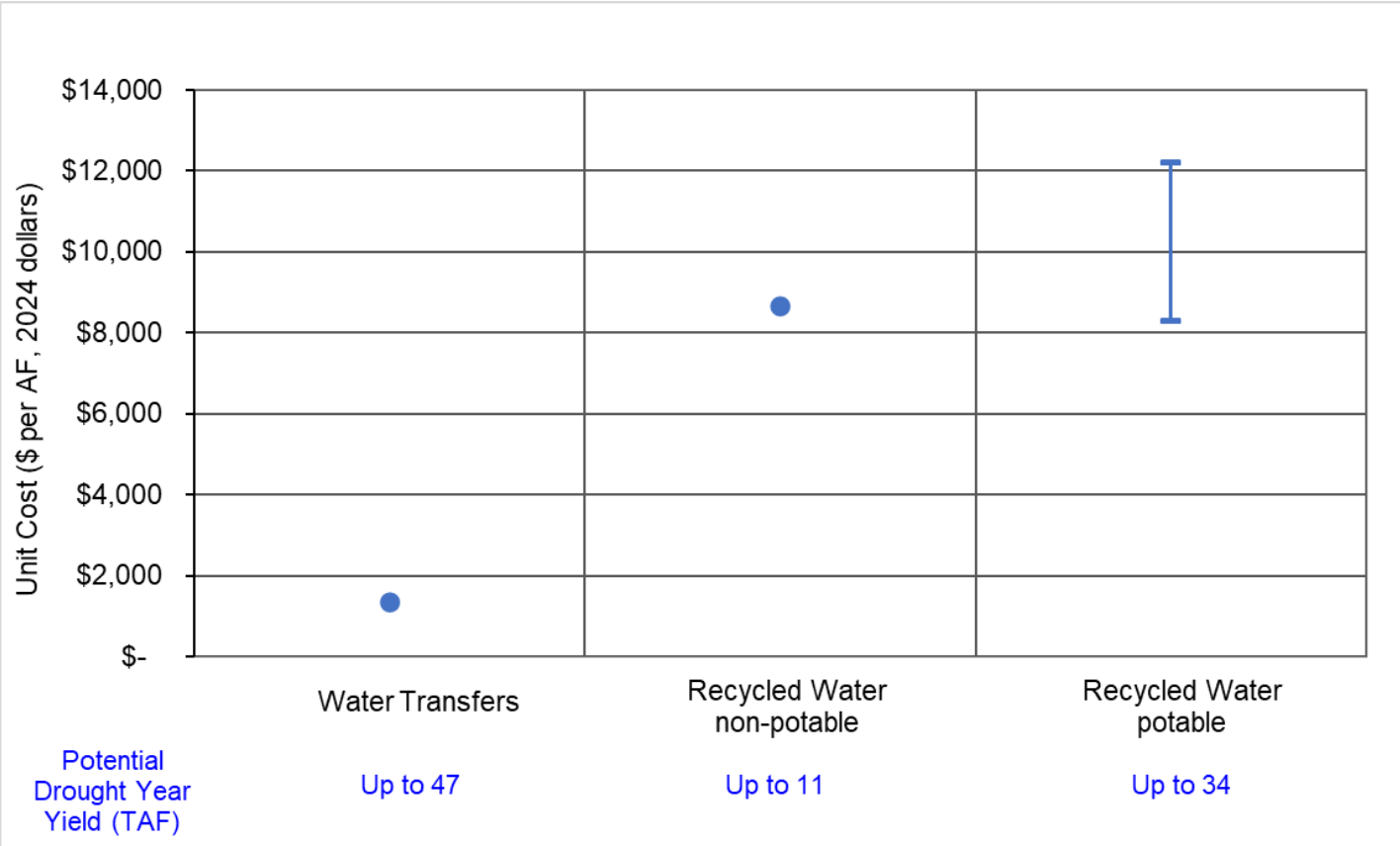
UWMP: Urban Water Management Plan

Potential Future Supplemental Supply Sources

Supply Alternatives	Dry Year	Yield (TAF)	Key Considerations
Water Transfers	1, 2, 3	10 to 47 TAF per year when available	Quantities variable; market transfers less reliable as drought deepens. Healthy Rivers and Landscapes Program relies on transfers, so future market will be tighter.
Future Non-potable Reuse	1, 2, 3	Up to 11 TAF	Included in the need for water analysis (to be updated in Recycled Water Strategic Plan)
Potable Reuse	1, 2, 3	TBD (9 to 34 TAF preliminary draft)	Long lead time for education and outreach and to develop project; complex permitting and operations
LVR Expansion	3	20 TAF	Can be more resilient to provide water in year 3 and beyond; project risks
San Joaquin County (SJC) Groundwater Banking	3	TBD (Up to 20 TAF)	Permits, wells, and blending ratios in aqueducts may limit extraction capacity and require spreading over multiple years to achieve yield
Bayside	3	TBD (Up to 5 TAF)	Community outreach to address community concerns.

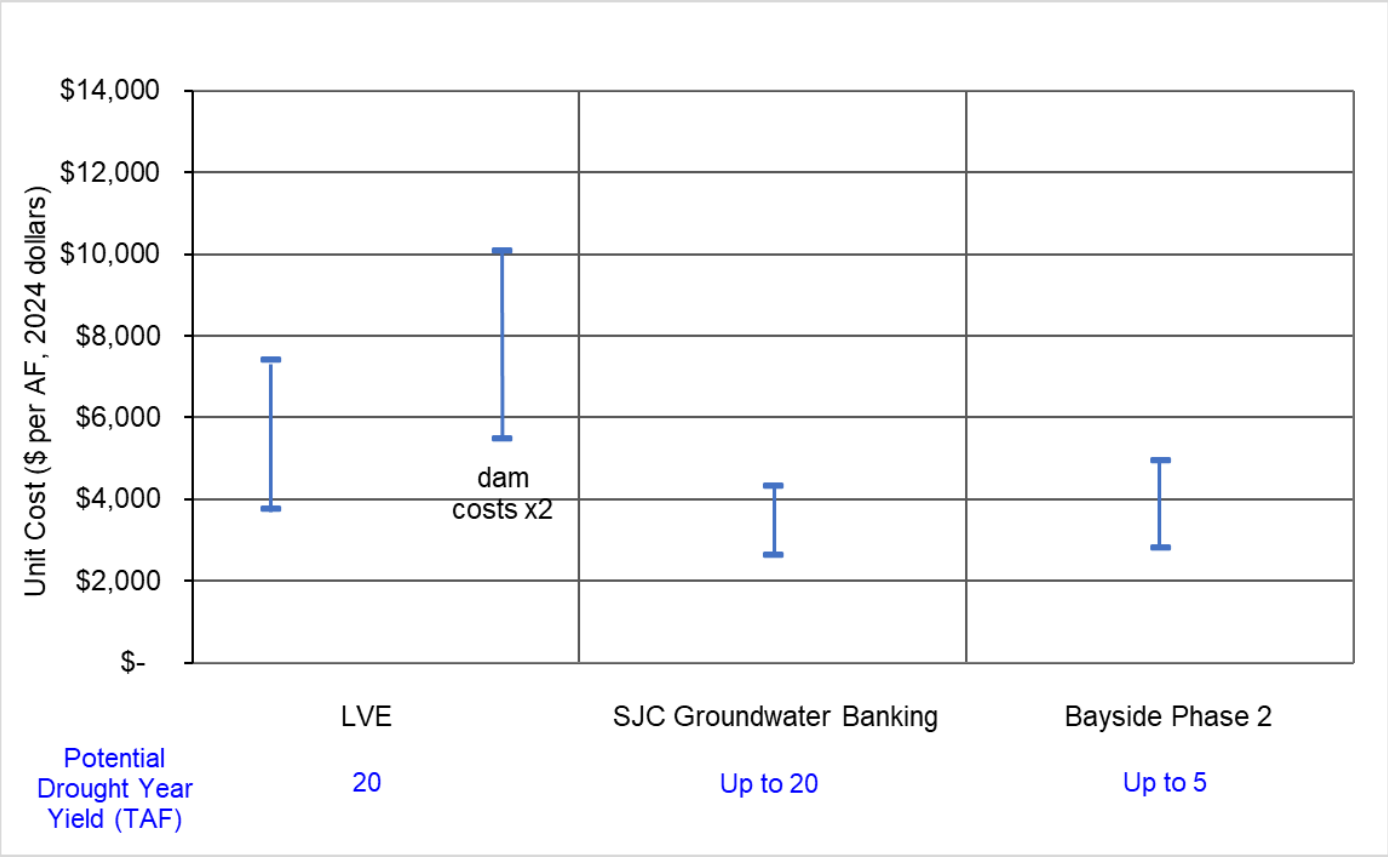
TBD: to be determined

Dry Year Unit Costs: Every Dry Year Alternatives



- Water transfers
  - Based on actual operations, maintenance, and supply costs
  - In general, reliability decreases and cost increases as drought deepens
- Recycled water
  - Non-potable cost escalated from 2019 Recycled Water Strategic Plan
  - Draft potable costs from 2024 Update
  - Assumes yield is 3 dry years out of 10

Dry Year Unit Costs: Third Drought Year Alternatives



- Range in costs represent bookends of potential drought use frequency
  - 1 in 8 years to 1 in 15 years
- LVE unit cost includes if dam cost doubles
- SJC GW banking costs are based on preliminary concepts with NSJWCD and SEWD
- Bayside costs are based on WSMP 2040 and re-calculated
- LVE is the most expensive third drought year alternative

NSJWCD: North San Joaquin Water Conservation District
SEWD: Stockton East Water District
WSMP: Water Supply Management Program

Qualitative Assessment of Supply Alternatives

Supply Alternatives	Outcome Control	Implement-ability	Supply Assurance	Unit Cost
Water Transfers				
Future Non-potable Reuse				
Potable Reuse				
LVR Expansion				
SJC Groundwater Banking				
Bayside				

Most favorable

Least favorable

- Overall, LVE is the least favorable option
- If LVE dam cost doubles, dry year unit costs become comparable to potable reuse which has greater yield reliability

Supplemental Supply Options to Meet Need for Water

- With reduced upcountry demand, future need for water could be met without LVE if water transfers and SJC groundwater banking are available
- To account for uncertainties in future need without LVE, the District will need to plan for other supplemental supply options and additional transfer opportunities and/or potable reuse projects

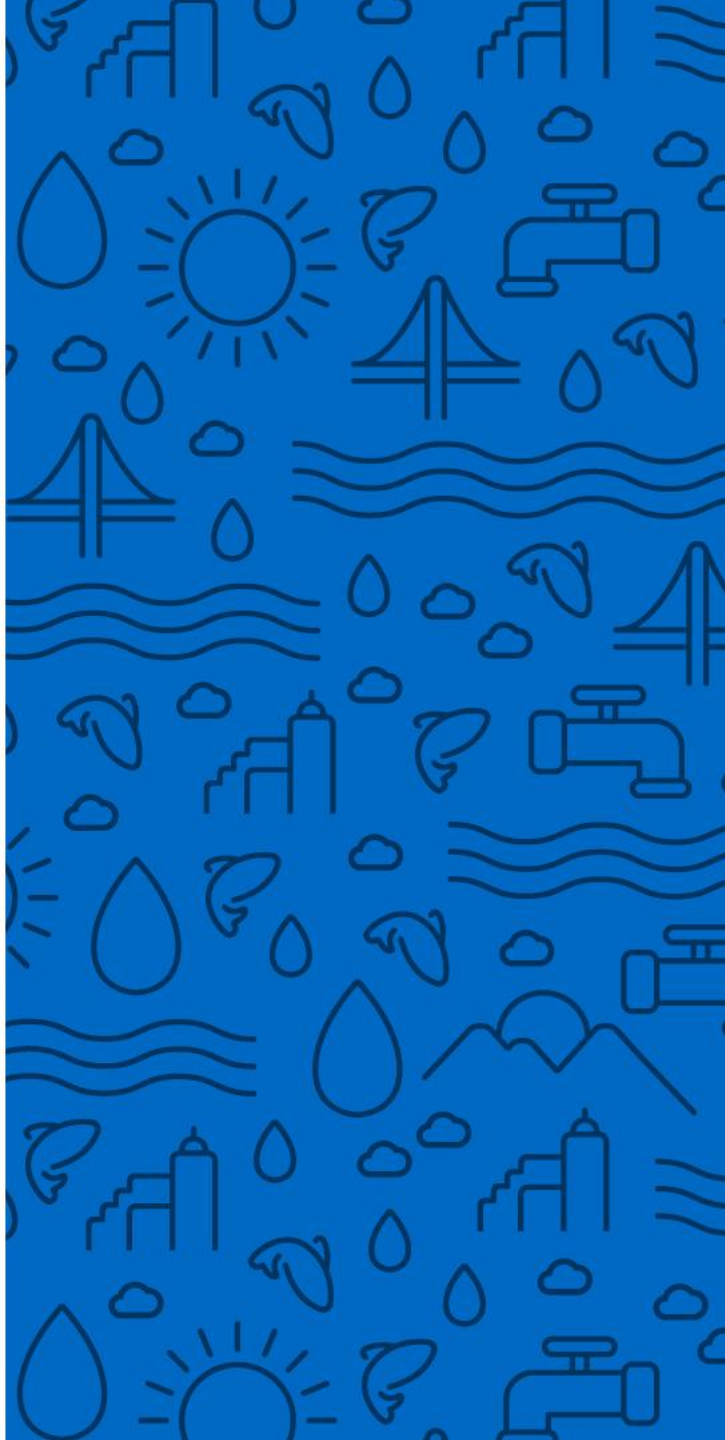
LVE Agreements Status

- Key issues remain after multiple efforts by the District, other member agencies, and JPA to resolve them
- In June, CCWD sent a letter to the member agencies requesting consideration of policy questions to clarify commitment level
  - Indicates CCWD's firm position on key outstanding issues
  - CCWD would like participation decisions by September 2024, but project schedule calls for project commitments by April 2025
- Staff does not recommend the District accept the current terms of the agreements

Agreement Issues

- Creates cost and construction liability risks by limiting JPA controls
  - CCWD does not consider itself a beneficiary of dam enlargement
  - CCWD has overall decision-making authority during construction
  - District and other member agencies assume all financial and liability risks for the dam construction
- Creates risk of not receiving expected supplies
  - CCWD will not guarantee delivery of water to partners because it must serve CCWD customers first
- CCWD proposed an amendment to the JPA Agreement to include a term that gives them veto rights over the JPA

LVE Participation Options and Recommendations



Participation Options and Considerations

Option	Description	Considerations
1	District does not participate as a JPA member	• May be excluded from participating in the project in the future
2	District participates at its original storage request of 30 TAF or less	• District's share of the up-front costs is at least $200M • Potential for financial and construction risks for the dam and not receiving expected supplies • JPA Agreement issues
3	District remains as a JPA member without any allocated storage	• No cost share but may have to pay JPA administration fees • District could later pursue a temporary or permanent assignment of available storage capacity and conveyance rights from another JPA member

JPA may reallocate $23.7 million of grant funding for Walnut Creek Pumping Plant upgrades to other Project facilities, particularly under Options 1 & 3

Staff Recommendations

- District remains as a JPA member without allocated storage (Option 3)
  - Allows time for District to complete its updated demand study and future need for water, while preserving District's access to LVE storage if it becomes available with better agreement terms
- Participate by conveying water for the JPA member agencies including supporting CCWD during backstop with full reimbursement to the District
  - District supports the regional benefits that LVE could provide
- Continue to plan for droughts, reduce demands with water conservation and recycling, develop supplemental supplies including water transfers, underground storage, and if needed, potable reuse
- Discuss recommendations with full Board on August 27, 2024

Questions?

FLOWING INTO THE FUTURE

Trench Soils Management Update

Planning Committee

August 13, 2024

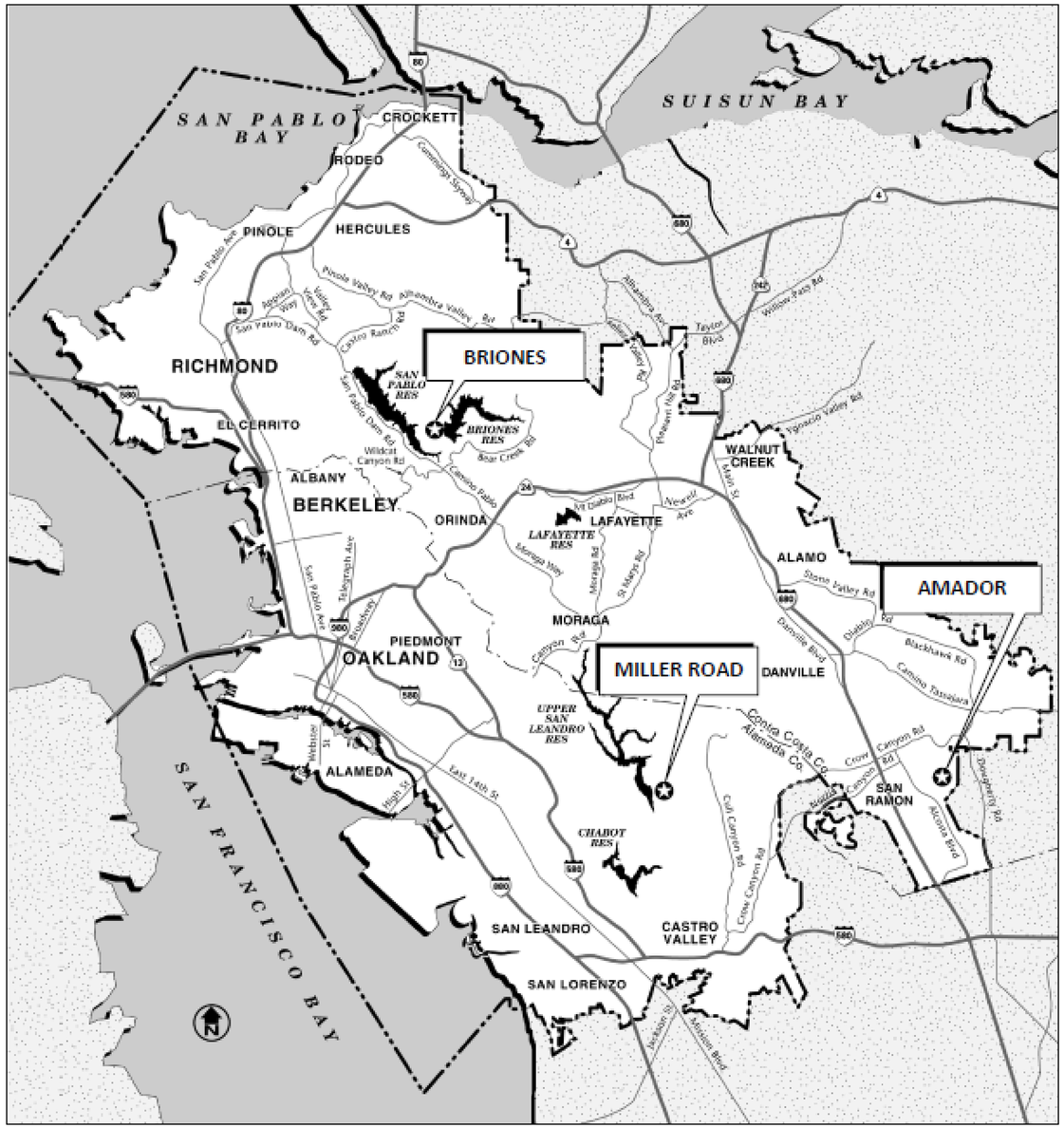
Overview

- Background
- Briones and Miller Road updates
- Trench soil management options
- Next steps

Briones Trench Soil Stockpile

Background

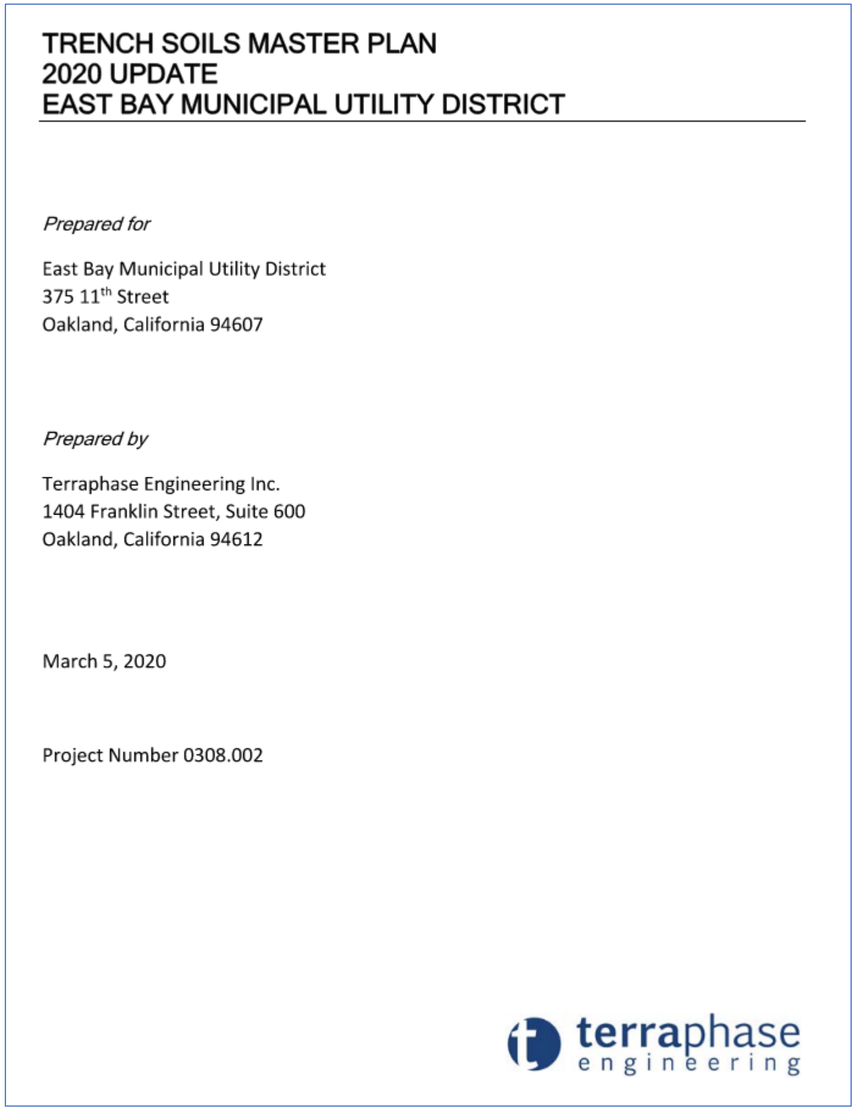
- Approximately 50,000 cubic yards (CY) of trench soils are generated annually
- Stockpiled temporarily at the following District sites:
  - Briones 563,000 CY
    - 63% Full (before 2024 removal)
  - Miller Road 123,100 CY
    - 92% Full
  - Amador 65,000 CY
    - 91% Full



District Stockpile Locations

Trench Soils Master Plan

- Documented existing trench soil management program
- Projected soils generation through 2029
- Developed alternative strategies to manage trench soils



TRENCH SOILS MASTER PLAN
2020 UPDATE
EAST BAY MUNICIPAL UTILITY DISTRICT

Prepared for

East Bay Municipal Utility District
375 11th Street
Oakland, California 94607

Prepared by

Terraphase Engineering Inc.
1404 Franklin Street, Suite 600
Oakland, California 94612

March 5, 2020

Project Number 0308.002

terraphase engineering

Existing Trench Soil Management Practices

1.

Pipeline replacement

2.

Hauling to stockpile site

3.

Loading truck with engineered backfill for return trip to job site

4.

After temporary storage, re-loading at stockpile sites

5.

Second hauling to permanent disposal

6.

Beneficial reuse or landfill disposal

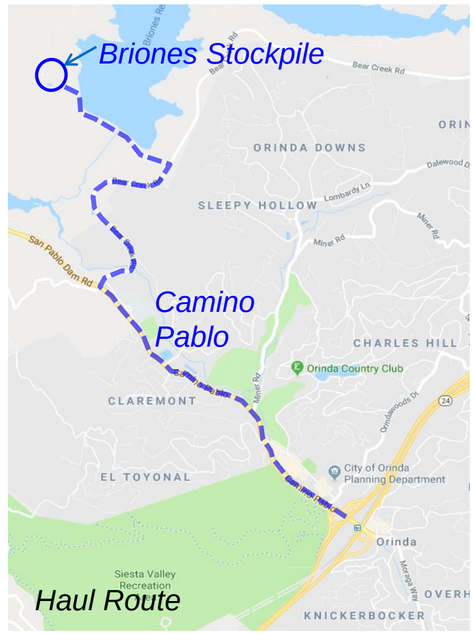
- Soil is typically hauled twice when District stockpile sites are used
- For permanent disposal, soil is off hauled periodically from District stockpile sites

2024 Briones Trench Soils Removal

Location	Projected Volume of Soil Removed (CY)	Typical Round Trips Per Day	Schedule	Projected Cost
Contra Costa County, Near Orinda	211,000	230	April 22 - August 9, 2024	$16.6 Million

Timing and volume of soil removal projects is based upon availability of beneficial reuse sites

Briones Stockpile Site



Briones Off-haul Summary

Beneficial Reuse Site	Purpose	Volume Delivered (CY)	Volume Planned (CY)
Dumbarton Quarry, Fremont	Restoration of quarry for East Bay Regional Park District	76,207	90,000
Oyster Bay Regional Shoreline, San Leandro	Shoreline Redevelopment	63,804	64,000
The Conco Company, Martinez	Site Development	46,345	47,000
USL Water Treatment Plant	Native Slurry Backfill	5,995	10,000
	TOTAL (CY)	**192,351**	**211,000**
	TOTAL (Truckloads)	**14,881**	**16,400**

2024 Briones Trench Soil Removal Project

- Work hours
  - 9:00 a.m. to 4:00 p.m., Monday-Friday
  - 9:00 a.m. to 3:00 p.m., Monday-Friday on school days (if needed)
- Covering all truck loads and providing weekly street sweeping
- Adhering to haul route
- No queuing, idling, or parking on local roadways at any time
- Implementing traffic signage to encourage safe driving including abiding by speed limits
- Monitoring trucks along the haul route
- Identifying and removing haulers that do not abide by the rules

Miller Road Stockpile Site, Alameda County

- Use of stockpile was suspended in 2023 while off haul permit is pursued
- Conditional Use Permit application submission to Alameda County (spring 2025)
- Initiated California Environmental Quality Act review (March 2024) to support permit
- Public meetings planned for early 2025

Location	North of Castro Valley
Approx. Volume of Soil Planned for Removal (CY)	17,000
Estimated Truck Round Trips Per Day	150
Estimated Schedule	June – August 2025
Estimated Cost	$1.1 Million

Miller Road Stockpile

Haul Route

Other Trench Soil Management Options

Direct Hauling

Amending Native Soil for Reuse in Trench

Trenchless Construction

Direct Hauling

- Soil hauled directly to end-use site
- Soil sampled prior to construction or at the end-use site
- Avoids temporary stockpiling
- Reduces greenhouse gas emissions (fewer trucking miles)
- Availability of receiving sites is intermittent (while generation of trench soils is continuous)

Typical Pipeline Construction

Direct Haul Pilot

- Receiving site: Dumbarton Quarry
- Started January 29, 2024 and is ongoing

Project	Truckloads (Jan 29 – Jul 31, 2024)
84th and B Cluster, Oakland	150
Camino Tassajara Cluster, Danville	94
Juanita Cluster, Walnut Creek	168
St. Mary's Road, Lafayette	144
E 16th Cluster, Oakland	17
Lincoln Cluster, Oakland	3
Total Truckloads (10 yard)	**576**
Total Cubic Yards	**5,760**
Percent of annual soil production	**11%**

Dumbarton Quarry Location

Future Opportunities for Direct Haul

Site Name	Purpose	Potential Quantity (CY)	Location
Dumbarton Quarry	Restoration of quarry for East Bay Regional Park District	3,000,000	Fremont
Redwood Road	Landslide Repair	8,000	Redwood Road, Alameda County
Montezuma Wetlands	Wetlands Restoration	12,000,000	Port of Richmond Wharf (Transferred to Delta by barge)
Eden Landing	Wetlands Restoration	200,000 to 600,000	Hayward
Supply Bank (Oakport)	Site Buildup for Development	22,000	Oakland
North Bay Logistics	Soil Enrichment	TBD	Livermore
Emeryville Crescent	Wetlands Restoration	TBD	Emeryville

Redwood Road Landslide Repair

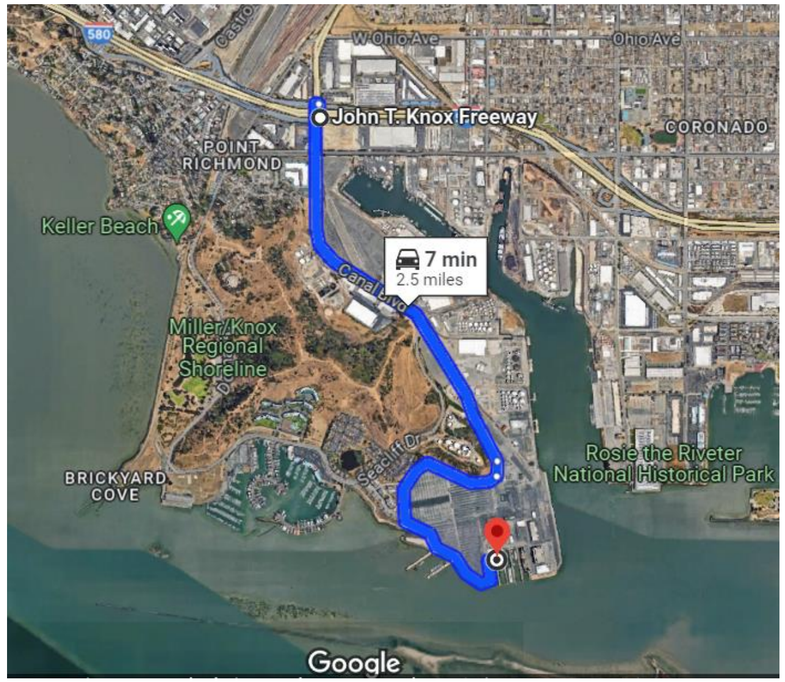
- Road closed since January 2023 landslide
- Working with County staff on acceptance criteria for utilizing Miller Road stockpile (<2 miles away)
- 8,000 CY to be transferred from Miller Road stockpile (summer 2024)
- Potential to eliminate 1,300 truckloads through Castro Valley

Redwood Road near Miller Road

Montezuma Wetlands

- Potential of 12 million CY
- Restoring tidal wetlands and habitats by raising the subsided site
- Transfer at Port of Richmond
  - Haul route avoids residential areas
  - May be able to use backfill from nearby Dutra plant to reduce truck mileage
- Can accept soil year-round, day and night, except during annual 60-day maintenance shutdown
- Currently in contract negotiations
- Request for Board authorization (late 2024)

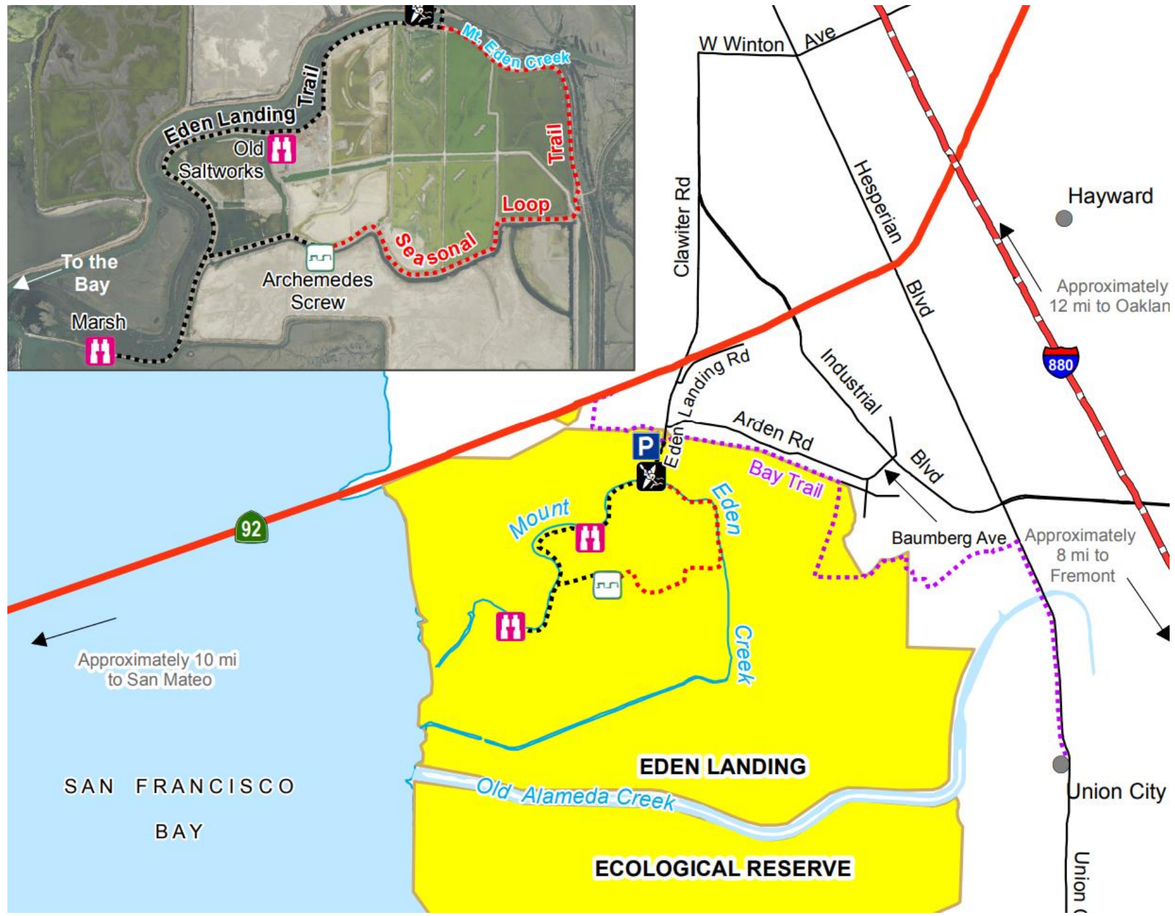
https://montezumawetlands.com/phase-1-breach/



Haul Route from I-580 to Port of Richmond

Eden Landing – Phase 2

- 200,000 to 600,000 CY, 2025
- Restoration of 1,375 acres of tidal wetlands, 400 acres of pond habitat, added flood protection, and 4 miles of Bay Trail
- Measure AA project / grantee
- California Environmental Quality Act documentation complete, in permitting



Location Map of Eden Landing, Phase 2

Supply Bank at Oakport

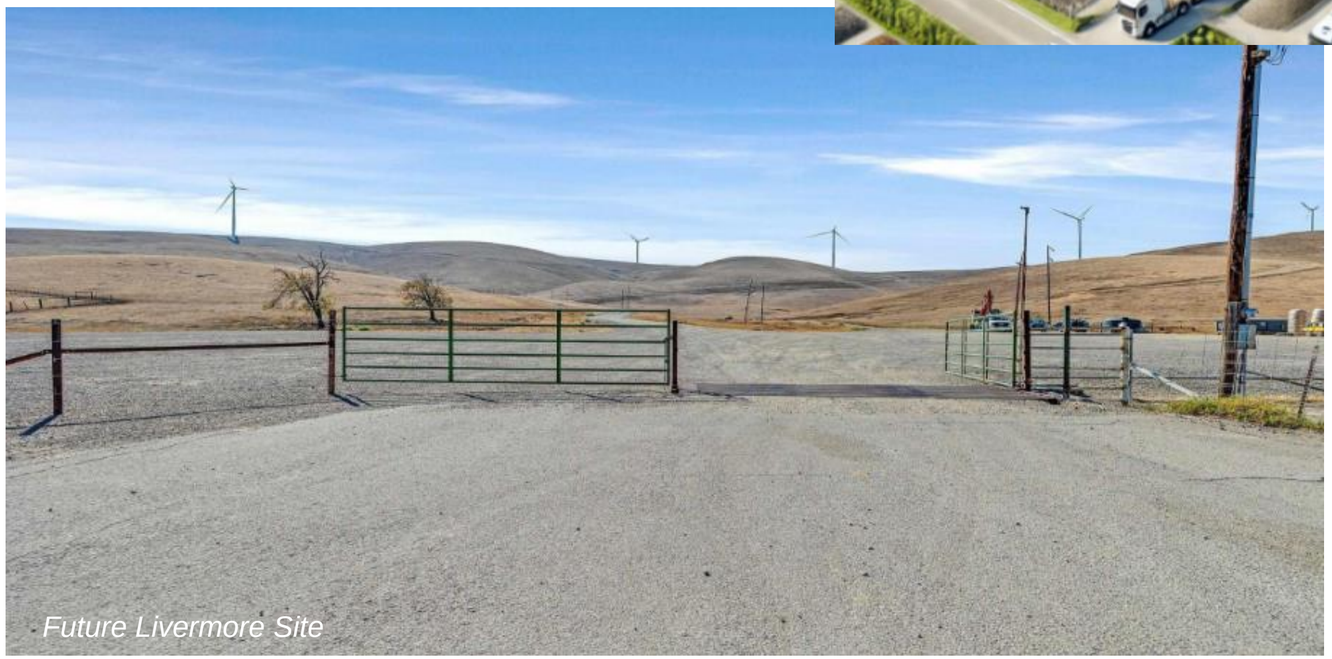
- 22,000 CY, late 2025-2026
- Raise elevation at site by approximately 5 feet

Rendering of Supply Bank Development

North Bay Logistics

- Volume TBD
- Proposed soil “regeneration” facility
  - Enrich soil to improve physical properties or fertility
- Livermore, with future sites under evaluation

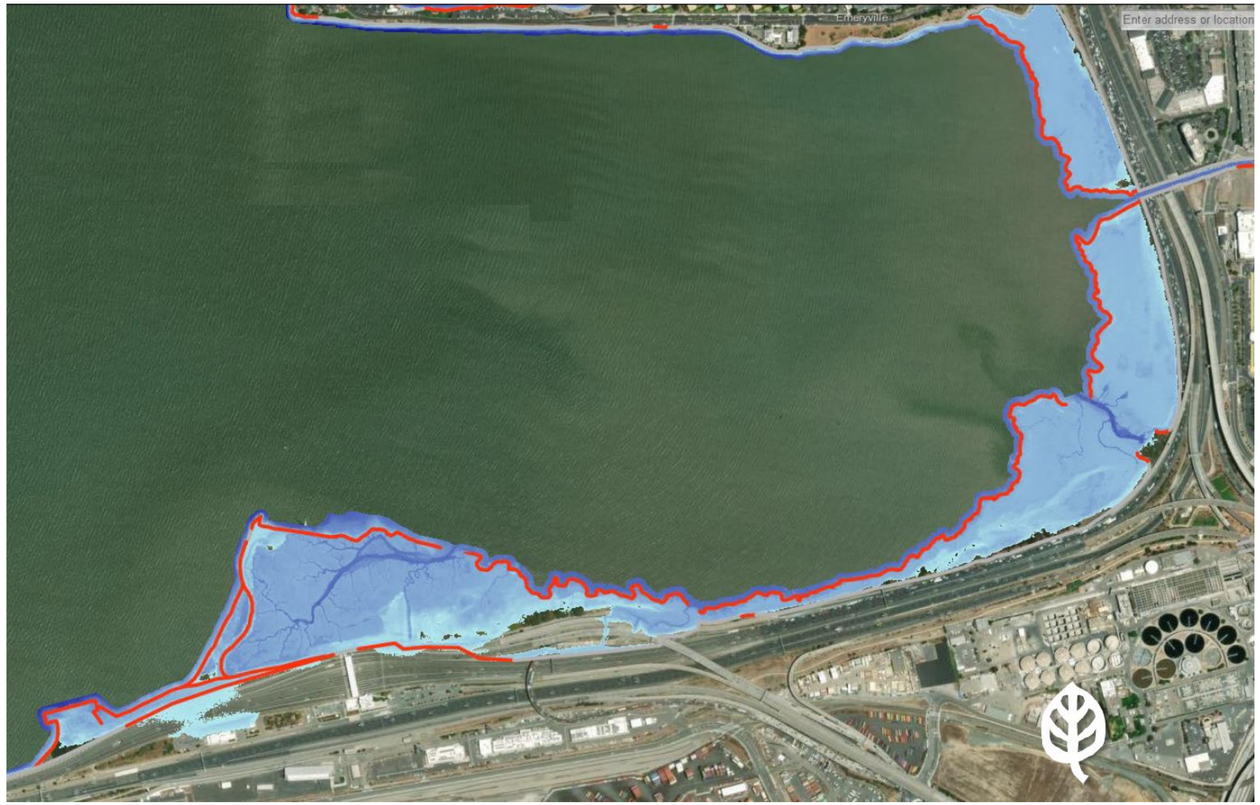
Rendering of Soil Regeneration Facility



Future Livermore Site

Emeryville Crescent

- Sea level rise adaptation and wetlands restoration
- Led by East Bay Regional Park District
- Addresses inundation & flooding at the Bay Bridge entrance
- Volume TBD, in planning



East Bay Regional Park District

Emeryville Crescent

Emeryville wetlands. Photo by BCDC.

Direct Haul Costs

Existing Practice	
Item	**Cost/CY**
Trucking to Briones	$30-$60
Stockpile Management	$14
Removal from Briones (hauling and disposal)	$79
Total Cost	**$123 - $153**

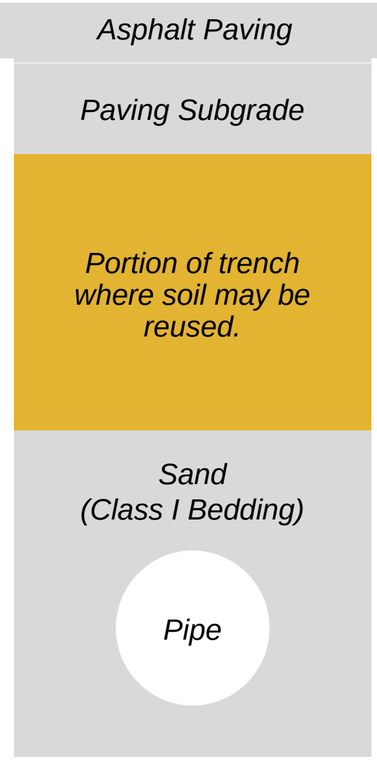
Direct Haul Costs	
Item	**Cost/CY**
Trucking to End Use site	$30-$110
Tipping Fee	$20-$65
Total Cost	**$50 - $175**

Expect cost will be lower as more reuse partners are developed, and the practice is optimized.

Amending Native Soil for Reuse in Trench

- Soil is mixed with additives and reused in trench
- District working with soil amendment contractor on agreement for pilot project
- Phase 1 for proof of concept with approximately 600 CY (project in Oakland)
- Phase 2 to scale up thousands of CY

Backfill of trench using screened native soil



Section View of Trench

Native Slurry Backfill

- Upper San Leandro Water Treatment Plant Reliability Project utilizing approximately 10,000 CY Briones stockpile soil to stabilize the site

Pumping native slurry in chlorine contact basin

Interior view of native slurry in chlorine contact basin

Trenchless Construction

- Horizontal directional drilling, pipe bursting, and slip-lining require plastic or polymer materials which is not the District's standard pipe material
- Cured-in-place pipe (CIPP) trenchless construction will be utilized for projects, as appropriate
- Plan to solicit bids for 2.5 miles of CIPP in late 2024
- Projects in Berkeley, El Cerrito, Oakland, Richmond, and San Leandro

Installation of CIPP Liner

Next Steps

- Award contract to Montezuma Wetlands, LLC for direct hauling to Port of Richmond (October 2024 Board Meeting)
- Award CIPP construction contract (2025)
- Miller Road Temporary Disposal Site
  - Conduct public outreach to support permitting application and completion of CEQA (February 2025)
  - Adopt CEQA for conditional use permit with Alameda County (March 2025 Board Meeting)
- Update the Planning Committee on trench soils management (March 2025)
- Continue to operate the District's temporary trench soils sites (i.e., Briones, Miller Road, and Amador), as needed
- Continue to pilot and evaluate alternative trench soils management methods

Questions?

FLOWING
INTO
THE
FUTURE