



**MARIN
WATER**

Water Supply & Roadmap Update

BOARD OF DIRECTORS

July 2, 2024

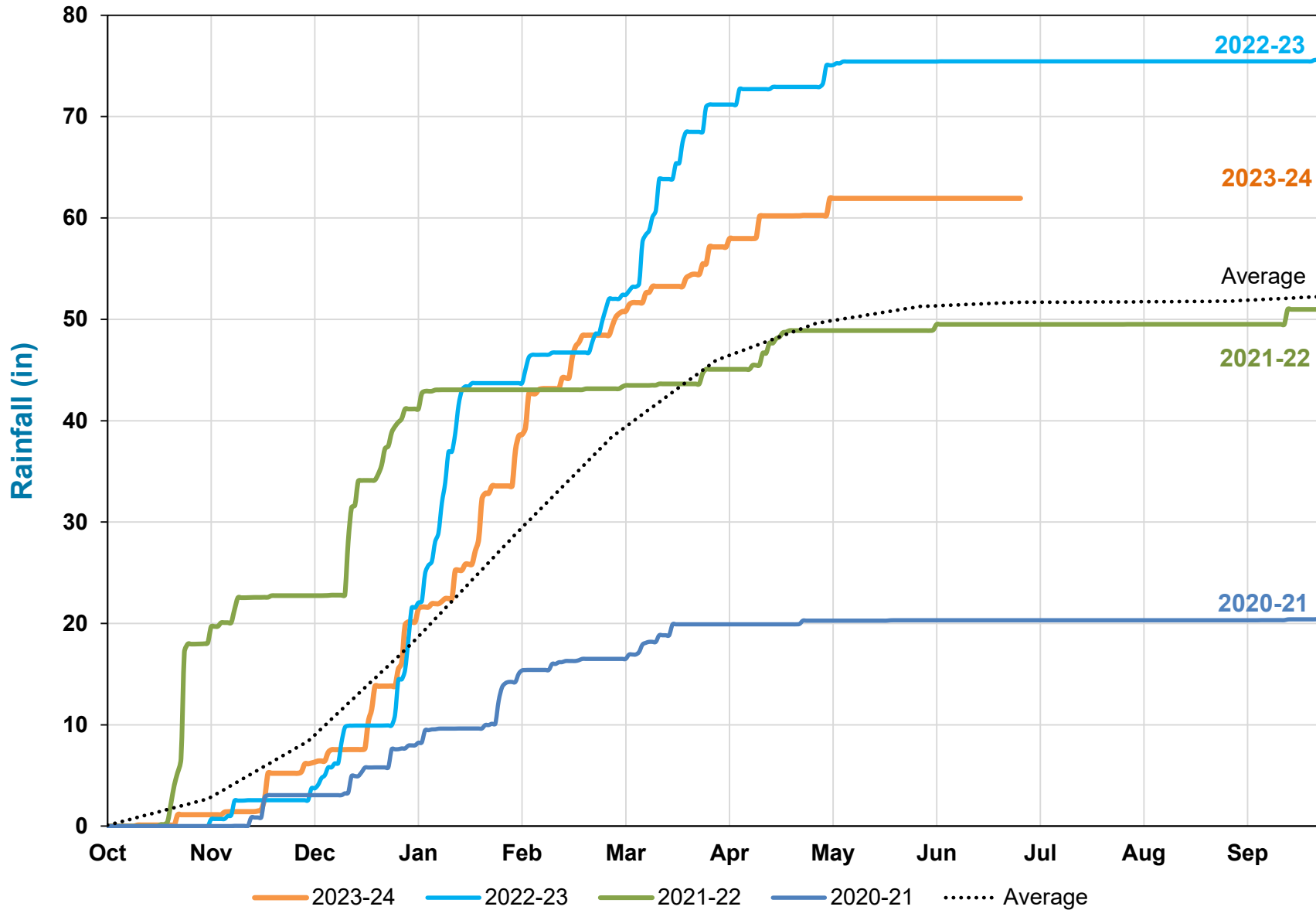


Overview

- Water Supply Conditions
- Water Use
- Water Supply Forecast
- Roadmap Review and schedule
- Summary and Next Steps

Water Supply Update

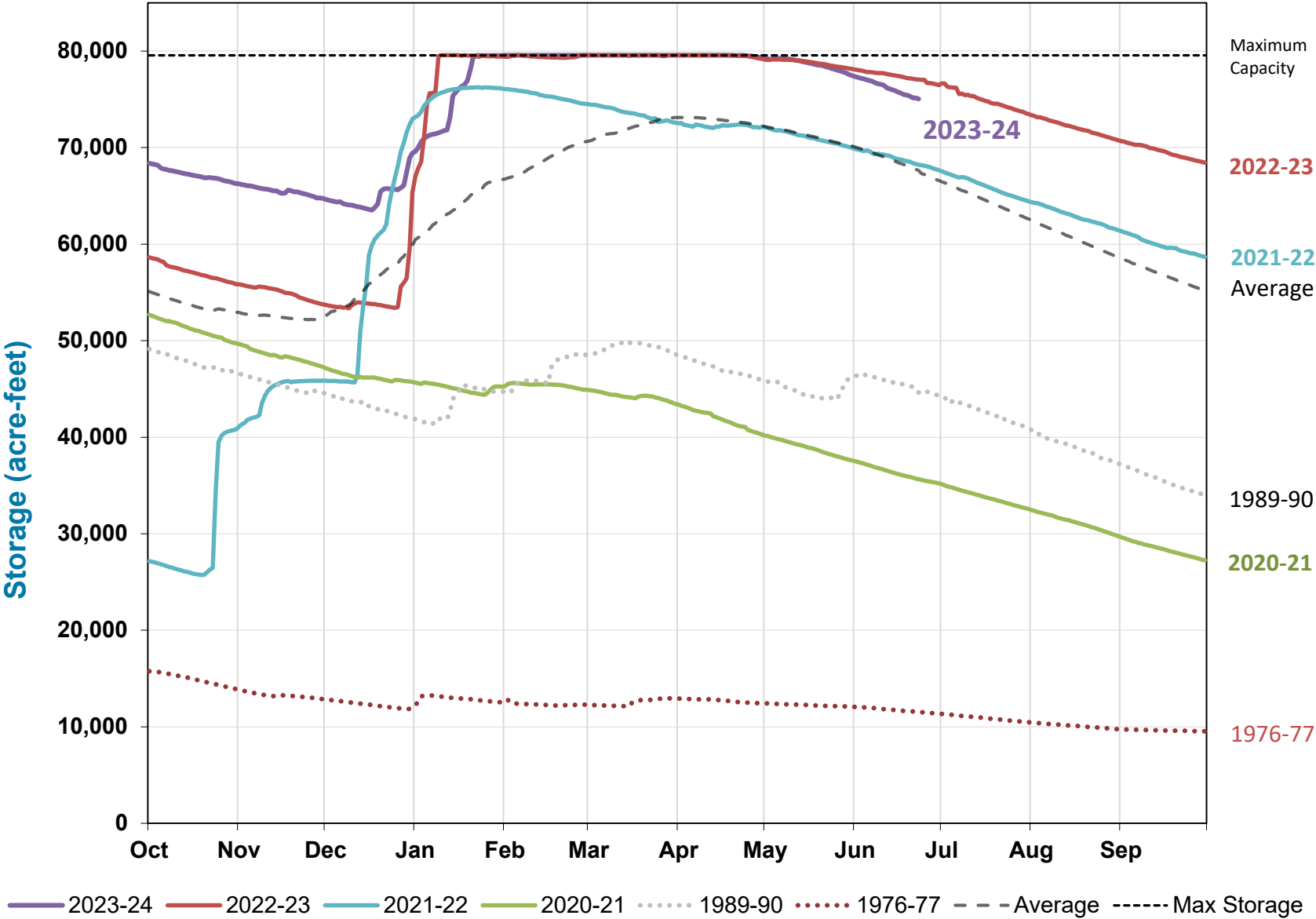
MMWD Cumulative Rainfall (Lake Lagunitas)



Cumulative Rainfall
this water year
(as of 6/30/2024): **62.0 in**

120% of average for this
date

Total Reservoir Storage



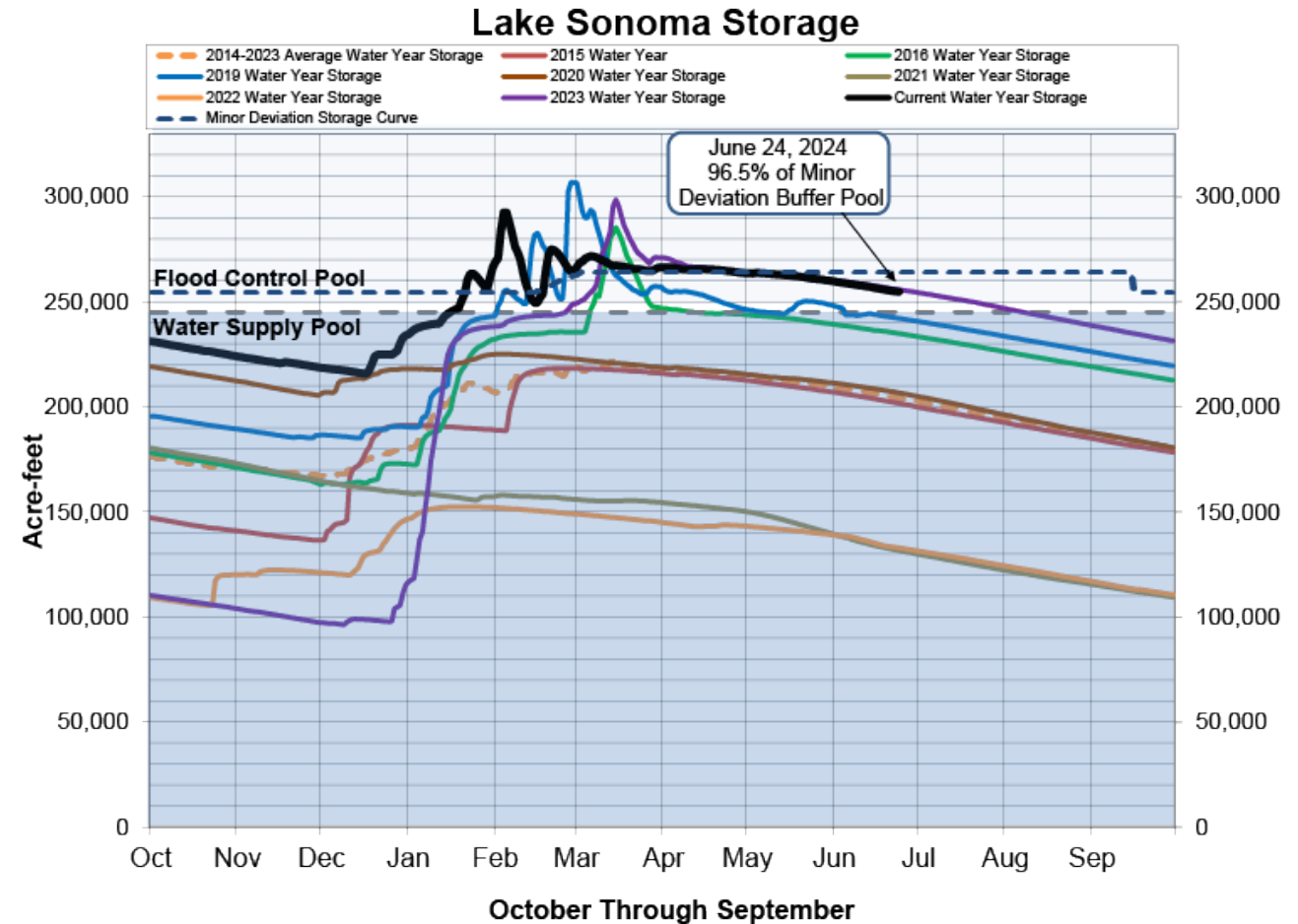
Sonoma Water Supply Conditions

Lake Sonoma

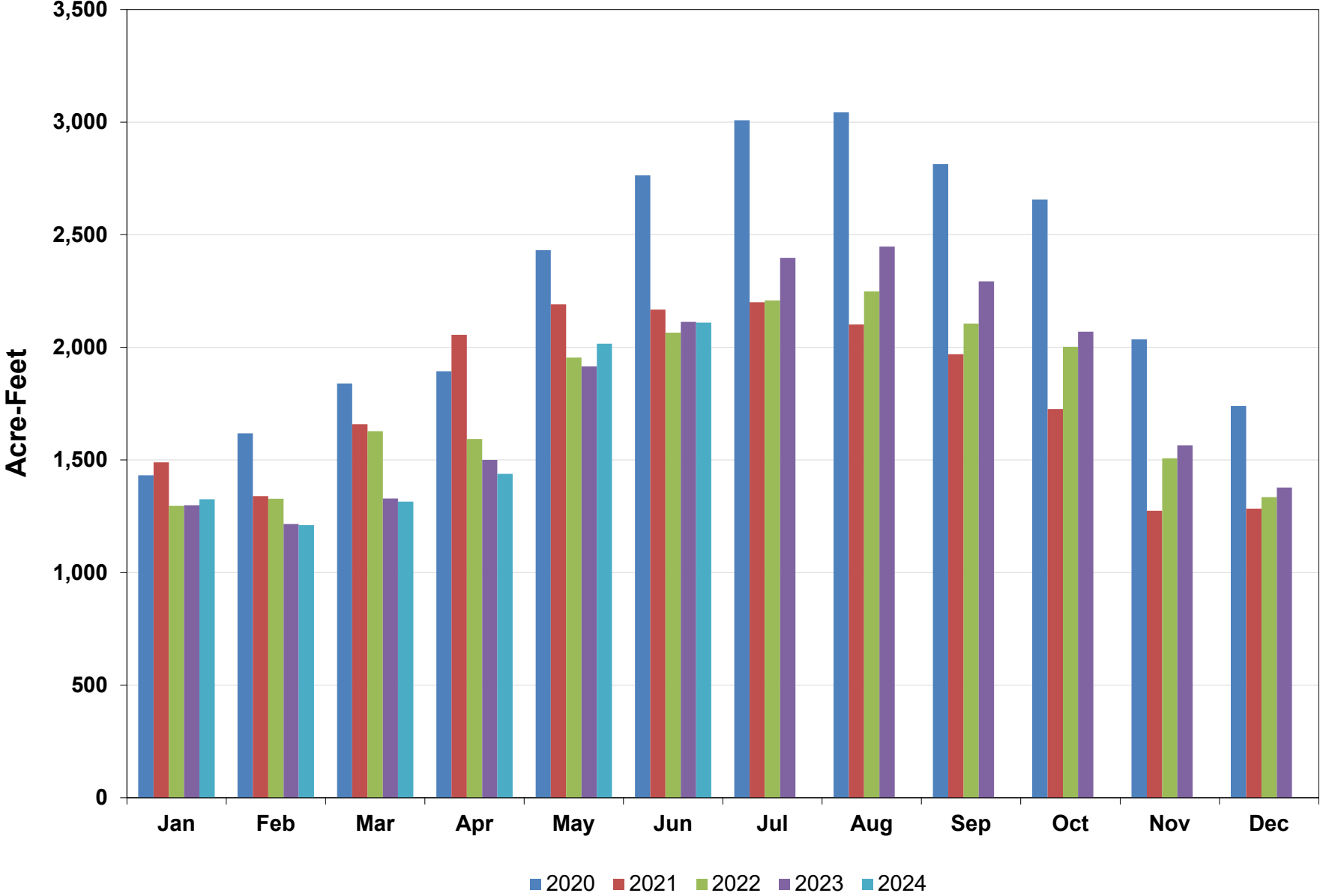
- 104% water supply pool (~124% of average)

Lake Mendocino

- 86% of water supply storage pool

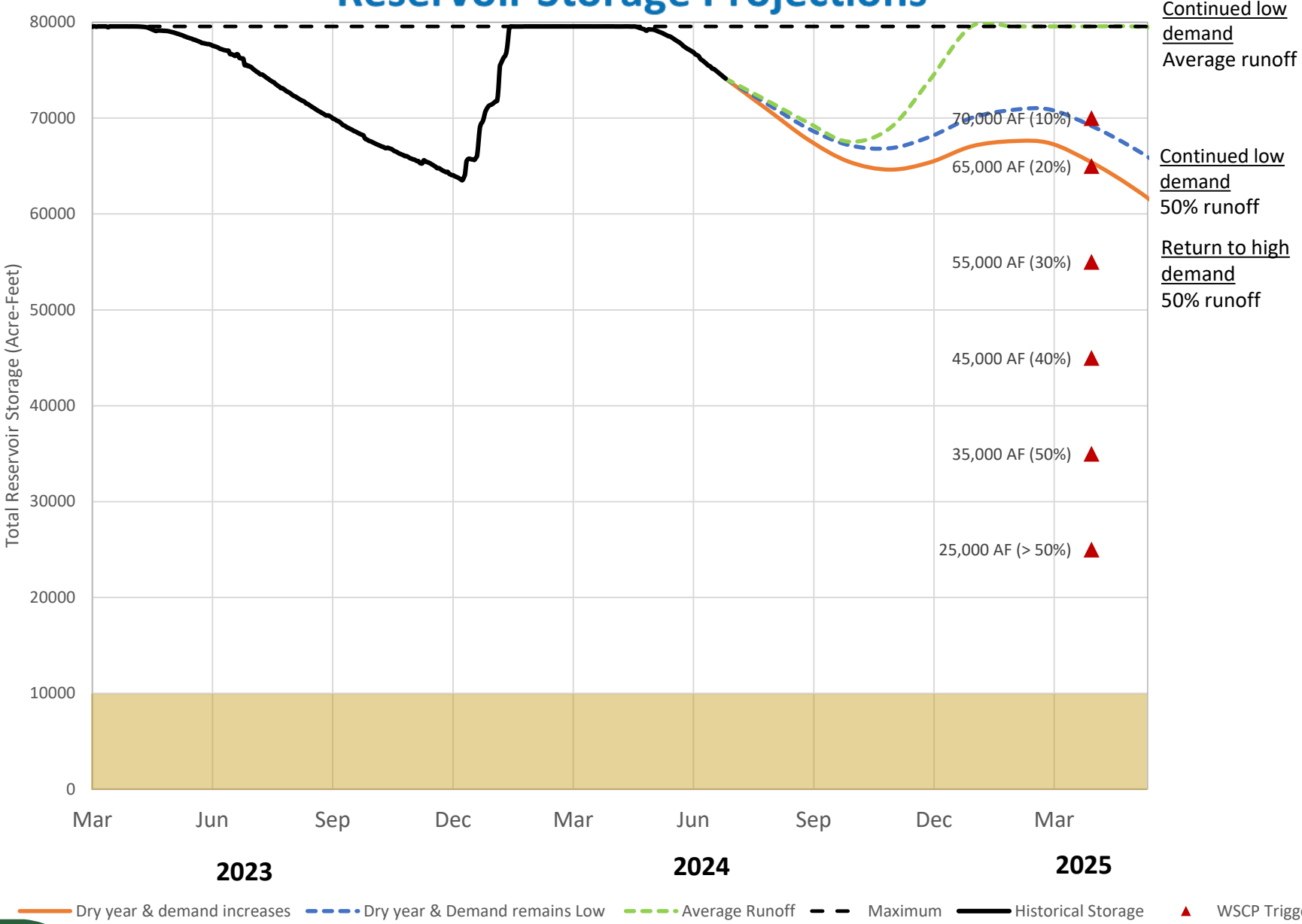


Monthly Potable Water Production



June production 24% below 2020 levels

Reservoir Storage Projections



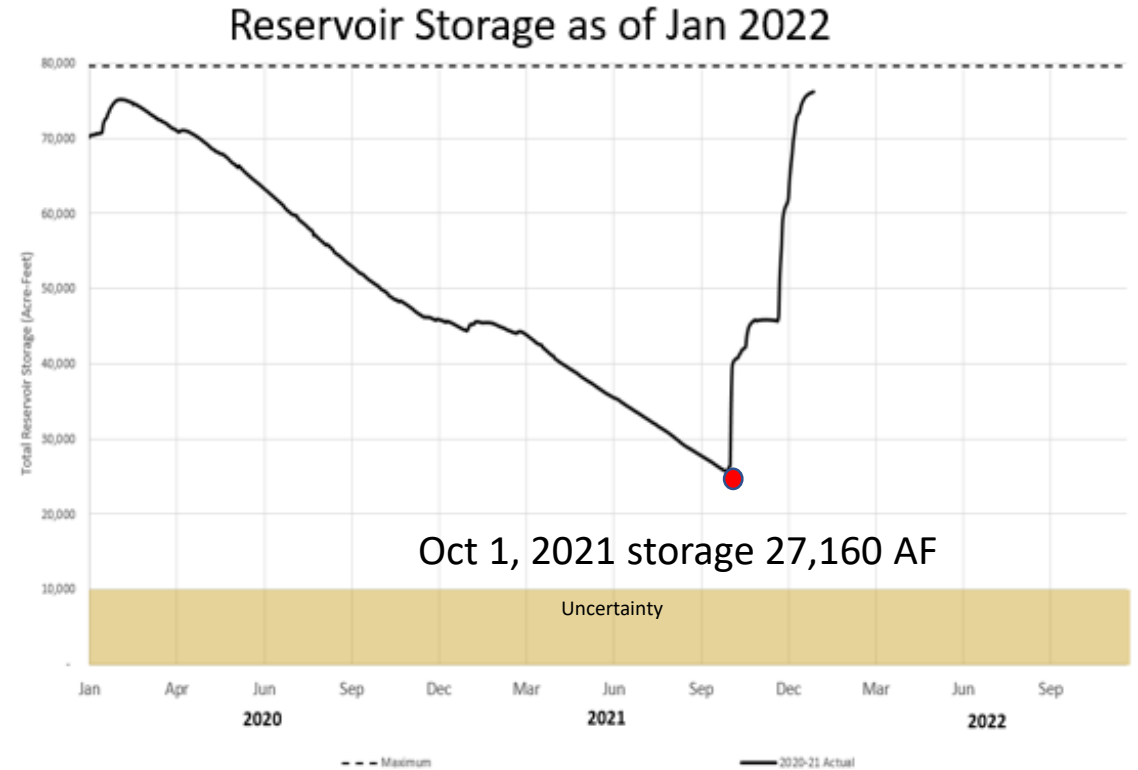
Water Supply - Summary

- Reservoir storage levels remain above average after two consecutive wet winters
- Conservation levels continue to be considerably below pre-drought 2020 levels

Water Supply Roadmap Update

Water Supply Roadmap - Background

- Storage on Oct 1, 2021 was 27,160 AF or less than 33% of total storage
- In Feb 2023 the board identified the Integrated Water Supply Roadmap to seek significant additional dry year supply



Water Supply Roadmap Work In Progress – Short term Projects

Project	Status	Estimated In Service	Capacity (AF)
Water Efficiency	Ongoing	Continuous	150-200
Soulajule Electrification & Connection to Nicasio	Preliminary Design	18-24 months	250-1000
Phoenix to Bon Tempe Connection	Preliminary Design	18 months	250-750
Stream Release Automation	Testing	6-12 months	100-1,000
Nicasio Spillway Modification	Design to begin in Summer 2024	16-24 months	3,000*

*Capacity

Work In Progress represents – 3,750 AF to 6,000 AF

Water Supply Roadmap - Background

- Longer Term Projects – (5,000 AFY – 12,000 AFY)
 - Recycled water
 - Desalination
 - Local Storage
 - Conveyance of winter water



Conveyance to Storage Project Alternatives

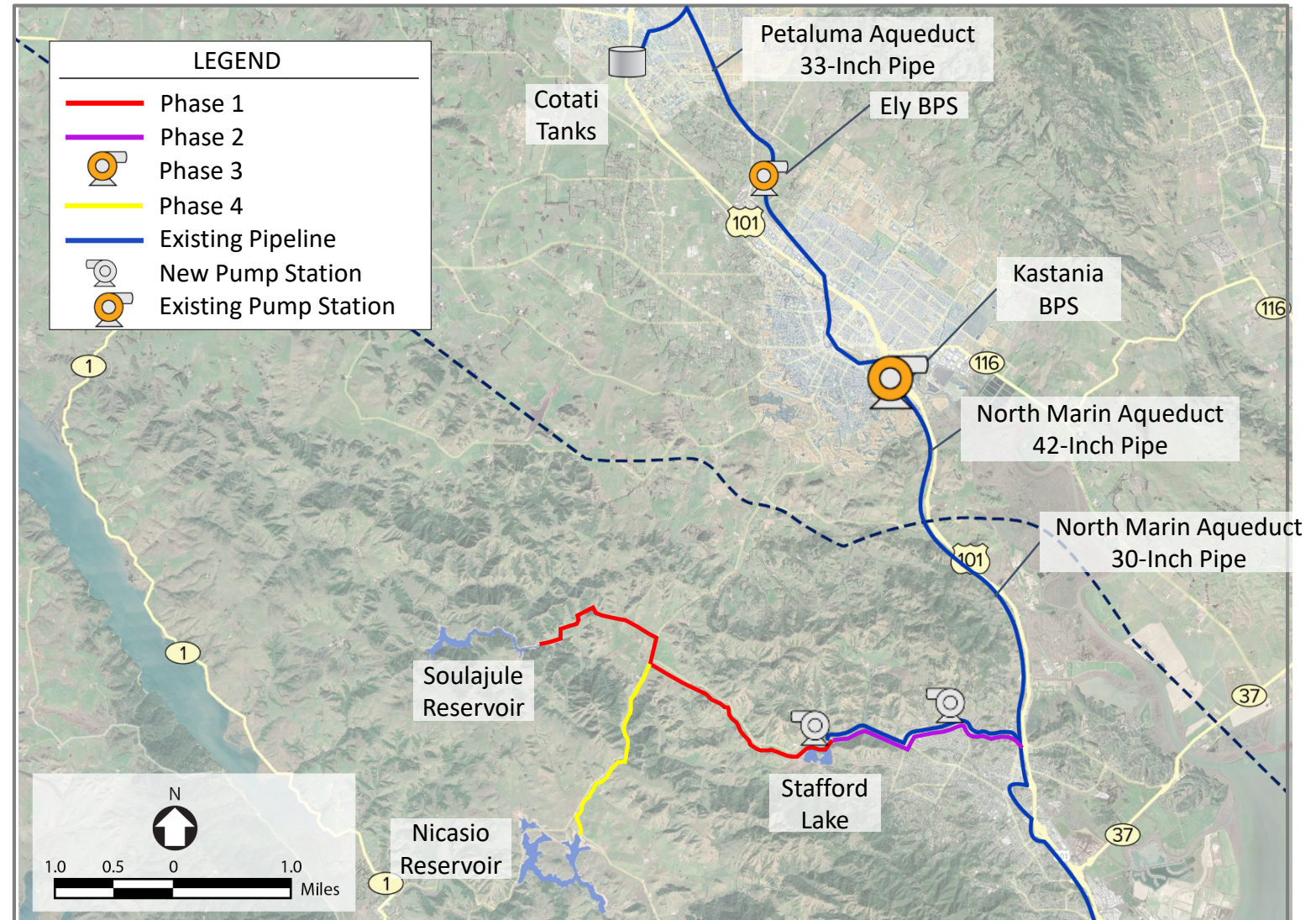
Description	Alternative	Details of Alternative	Length (miles)	Max MGD
Cotati Tanks to Kastania PS	STS-1	along 101 Corridor	10.5	0
	STS-2	through downtown Petaluma	12.1	0
	STS-3	through rural roads	15.5	0
Stafford Lake area to MMWD Lake(s)	STAF-1	to Nicasio Reservoir	8.0	3-7
	STAF-2	to Soulajule Reservoir	6.8	3-7
	STAF-3	to Nicasio and Soulajule Reservoir	11.0	3-7
North Marin Aqueduct to MMWD Lake(s)	PETA-1	to Nicasio Reservoir	13.2	10 14
	PETA-2	to Soulajule Reservoir	12.0	10 14
	PETA-3	to Nicasio and Soulajule Reservoir	16.2	11 14
	PETA-4	to Nicasio and Soulajule Reservoir via San Antonio Road	14.8	13 26
Cotati Tanks to MMWD Lake(s)	COTATI-1	to Nicasio Reservoir	24.2	30
	COTATI-2	to Soulajule Reservoir	20.5	30
	COTATI-3	to Nicasio and Soulajule Reservoir	25.9	30

Water Supply Roadmap Work In Progress – Conveyance To Storage

- Alternatives narrowed from 13 to shortlist of 3 alternatives:
 - Cotati 3- Pipeline from Cotati tanks to Soulajule and Nicasio
 - Peta 3- Pipeline from North Marin Aqueduct to Soulajule and Nicasio with project developed in phases
 - Peta 4- Pipeline from the North Marin Aqueduct along San Antonio Road to Soulajule and Nicasio
- Team continues to refine the alternatives optimizing alignments, right sizing facilities and costs
- Preferred Alternative Project could be completed in 4-5 years and provide 5,000 AFY

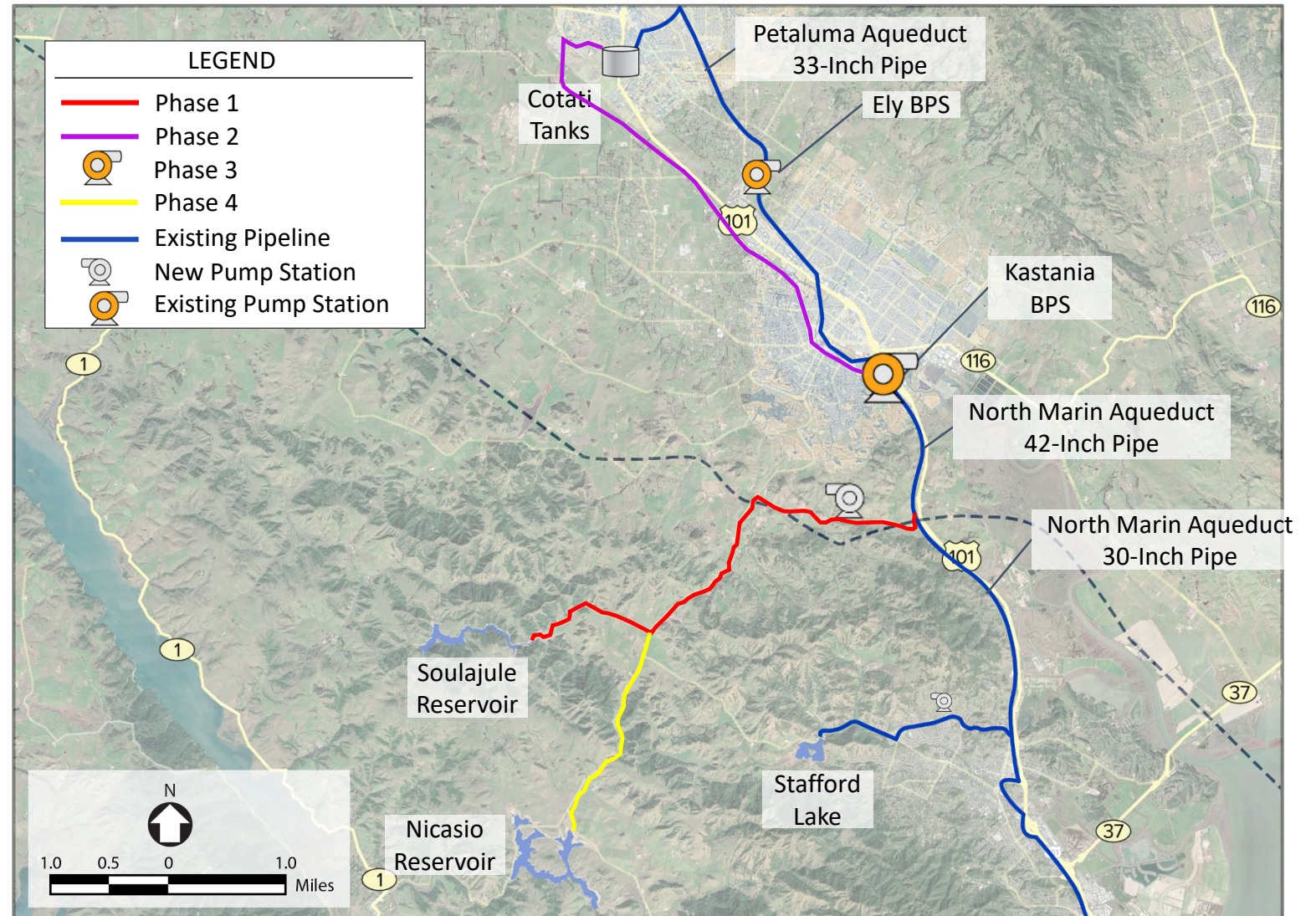
PETA-3 Alternative

- 10 mgd Water Supply Benefit
 - No Add'l Improvements
- 14 mgd Water Supply Benefit
 - Increase Kastania PS capacity and increase NMWD Aqueduct velocity to 8.7 fps



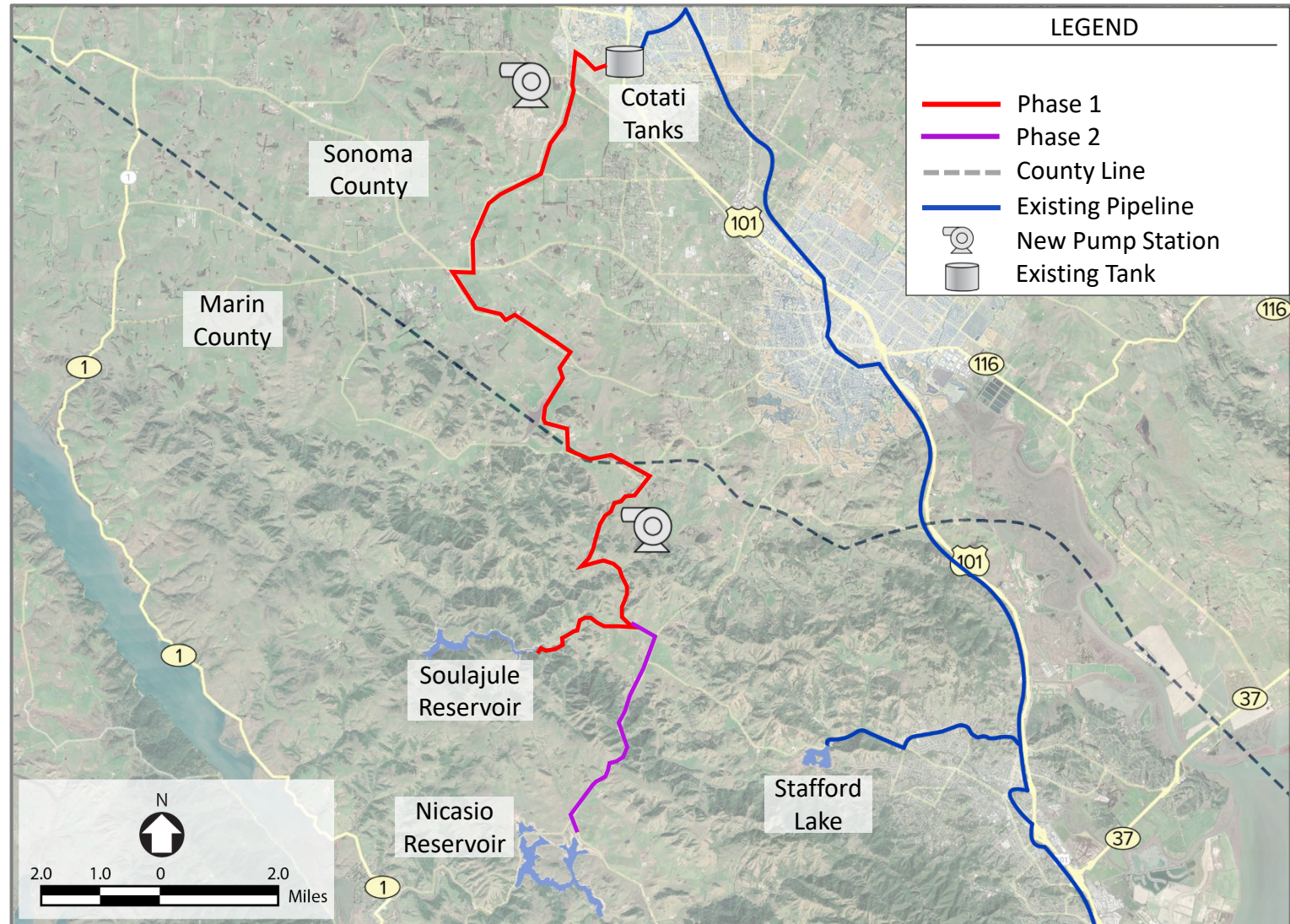
PETA-4 Alternative

- 13.0mgd Water Supply Benefit
 - No Add'l Improvements
- 26 mgd Water Supply Benefit
 - Construct STS
 - Increase Kastania PS capacity



COTATI-3 Alternative

- 30 mgd Water Supply Benefit
 - Allows design for District needs

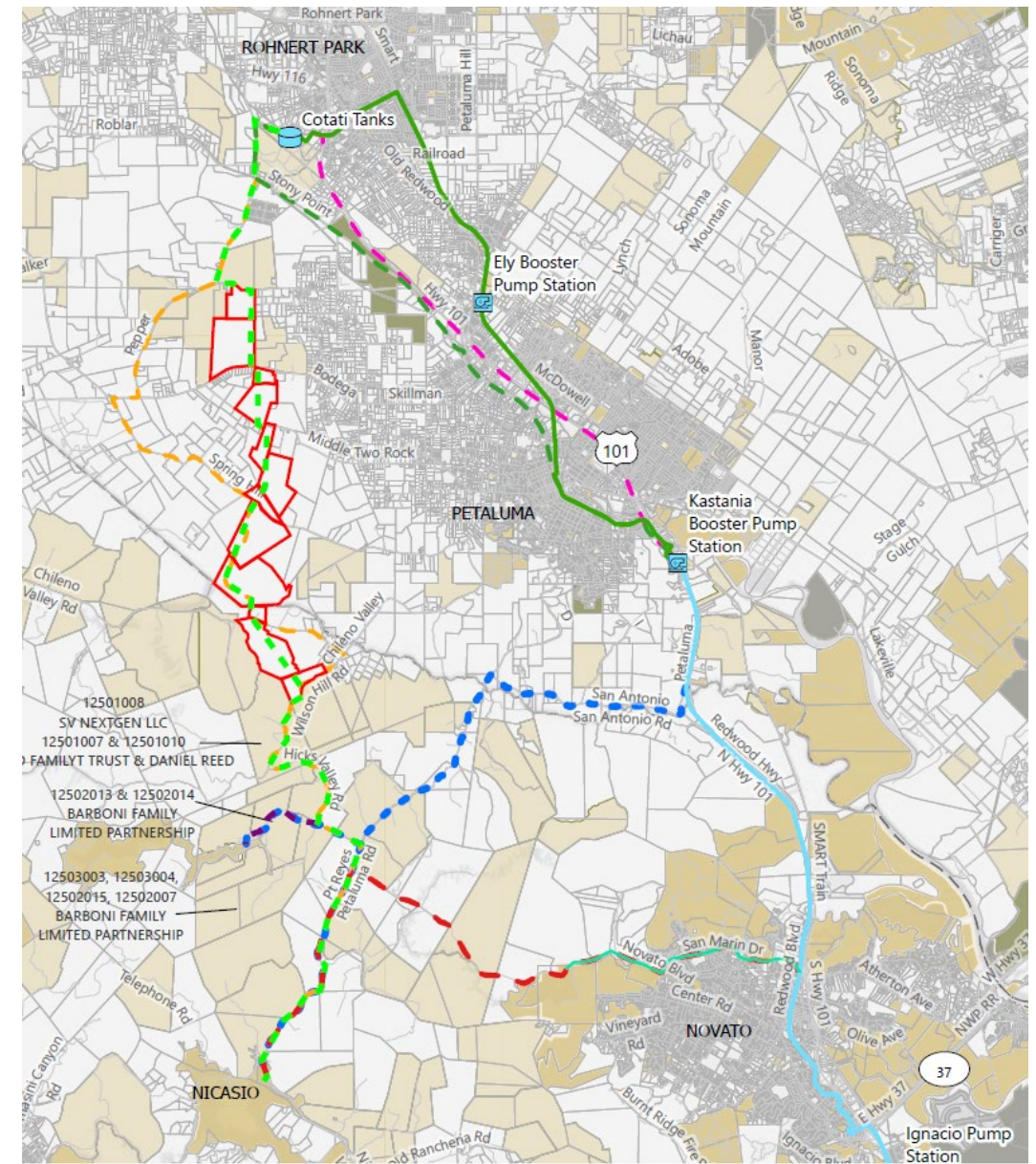


Water Supply Roadmap Work In Progress – Conveyance To Storage

- Key Activities Underway
 - Additional site visits to drive routes
 - Assessing a direct route for Cotati option to understand potential for cost savings
 - Hydraulic analysis to identifying size and potential locations for pump stations
 - Understanding PGE infrastructure capacity to assess fatal flaws
 - Environmental review of routes historic, cultural, biological etc
 - Understanding location of other utilities

Water Supply Roadmap Work In Progress – Conveyance To Storage

- Overland route from Cotati tanks through parcels outlined in red reduces distance by ~2 to 3 miles
- Potential cost savings of ~\$10M
- Considerations include more easements to negotiate



Local Storage Alternatives

- **Existing Reservoir Enlargement**

- Alpine
- Kent
- Nicasio
- SoulaJule

- **New Reservoir Construction**

- Devil's Gulch
- Halleck
- Upper Nicasio

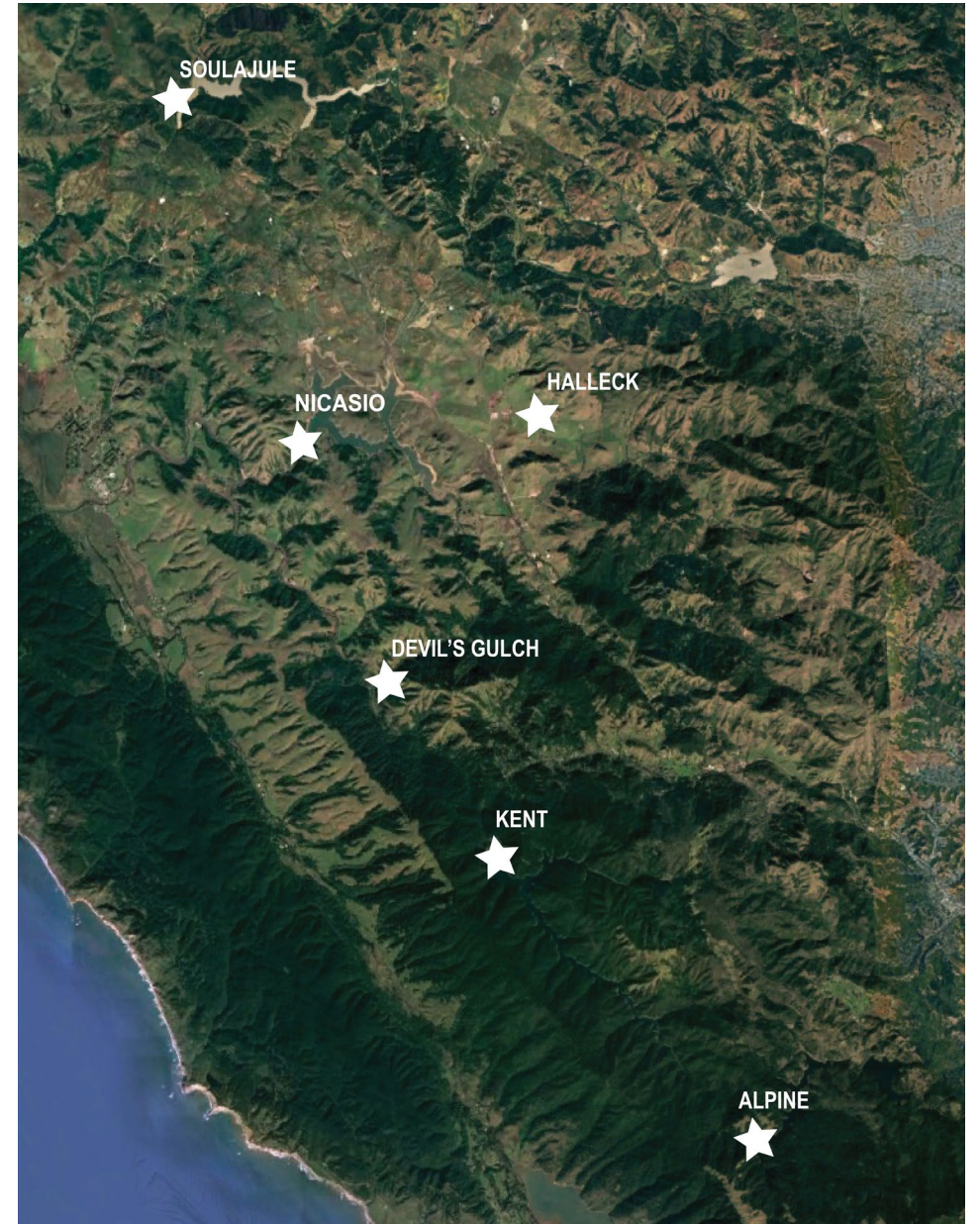
- **New Spillway Gates**

- Nicasio
- SoulaJule
- Kent
- Alpine

- **Other**

- Dredging

Blue font indicates alternative was added during the current work.



Water Supply Roadmap Work In Progress – Local Storage

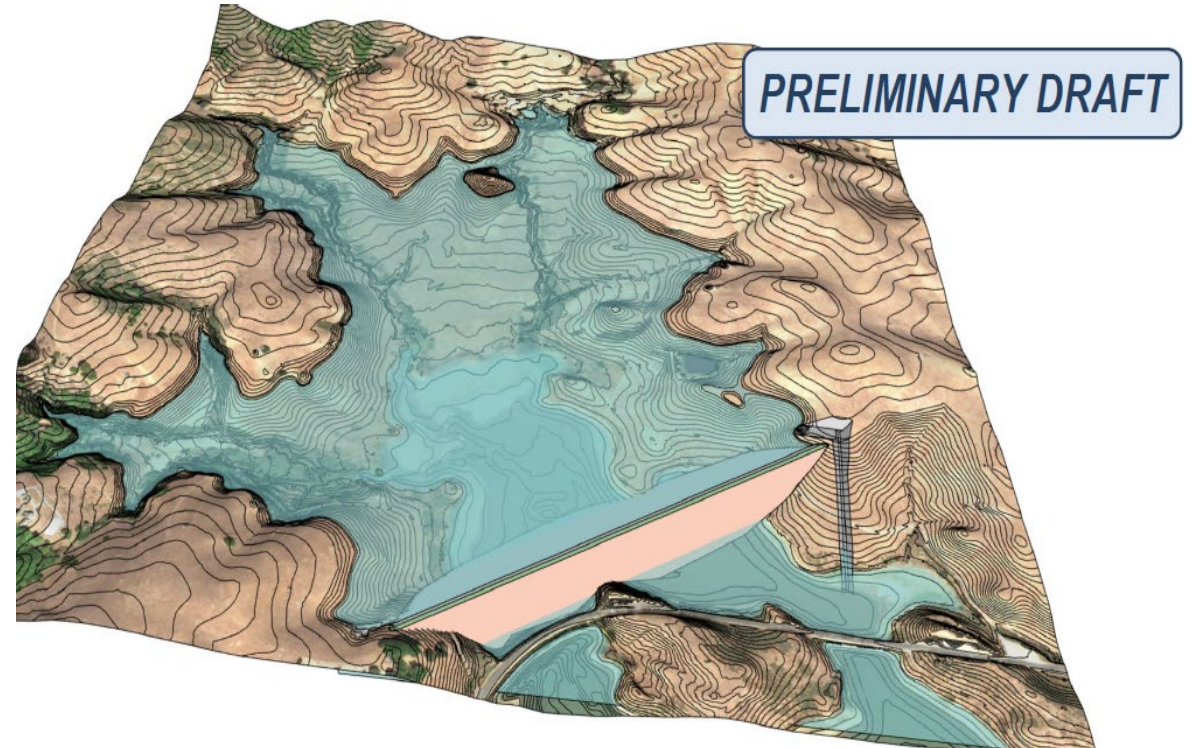
- Alternatives narrowed from 11 to 3:
 - Kent reservoir expansion
 - Soulajule reservoir expansion
 - Upper Nicasio (a new reservoir)
- Team is working to refine the conceptual designs, right size storage and costs
- Preferred alternative could be completed in 10 to 15+ years and provide 20,000 AF

Top 3 Storage Alternatives

Project Aspect	Soulajule	Upper Nicasio	Kent
Implementation	<ul style="list-style-type: none"> • Technically feasible • Normal constructability • Would inundate private land 	<ul style="list-style-type: none"> • Moderate technical risk • Normal constructability • Would inundate some private land 	<ul style="list-style-type: none"> • Significant technical issues to work through which could add cost • NSO impacts on construction cost may be substantial • MMWD owns land
Reliability	<ul style="list-style-type: none"> • Likely to self-fill • Could receive imported water 	<ul style="list-style-type: none"> • May not self-fill, and thus require pumping from Nicasio • Could receive imported water 	<ul style="list-style-type: none"> • Likely would self-fill • Not viable to receive imported water
Environmental	To be evaluated for any alternative that moves forward.		

Water Supply Roadmap Work In Progress – Local Storage

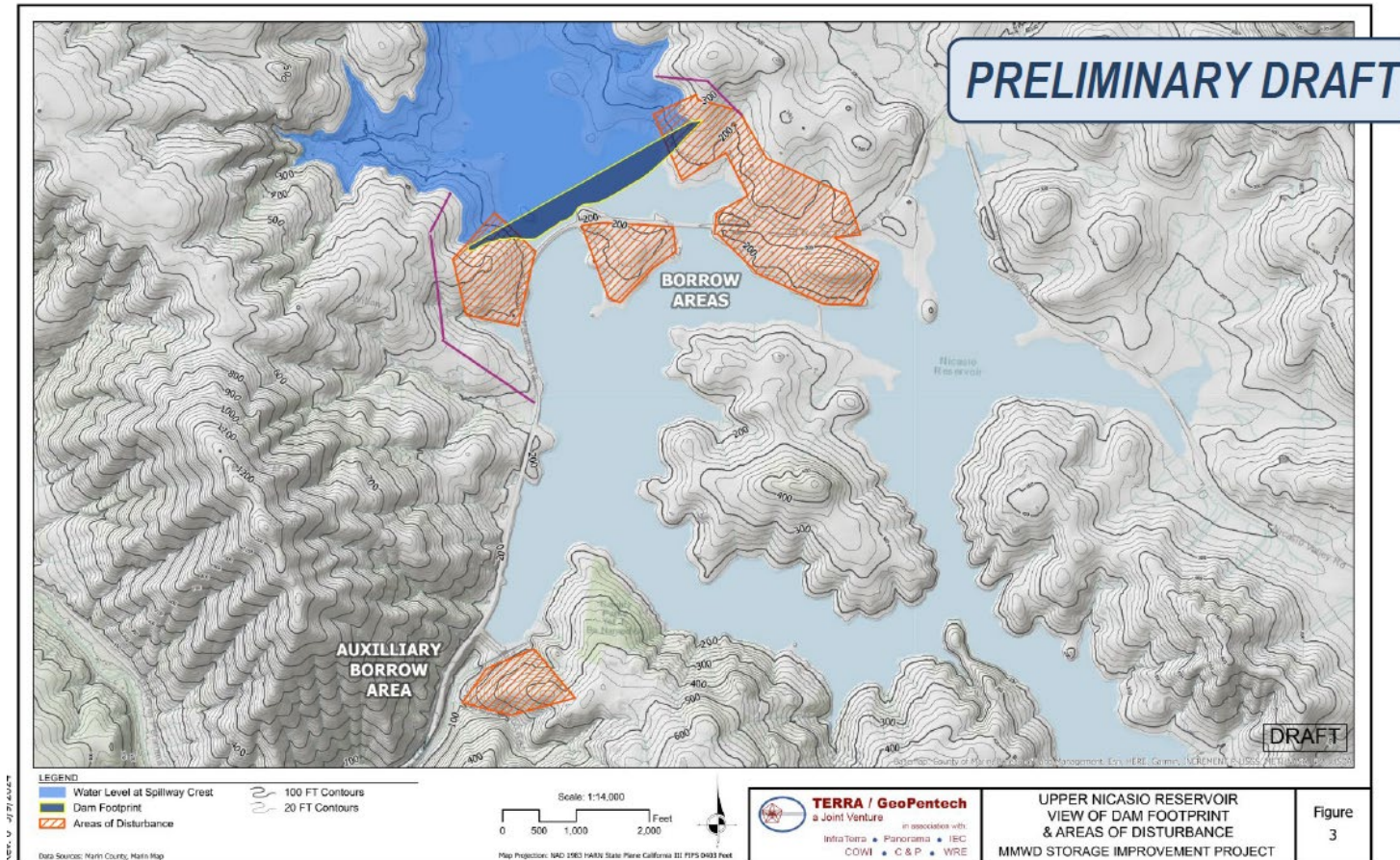
- Examples of work underway:
 - Site visits to reservoirs
 - Design modifications
 - Refining constructability and cost



Reconfigured Upper Nicasio Dam 20 TAF

Water Supply Roadmap Work In Progress – Local Storage

- Potential sandstone borrow areas just downstream of the dam
- Sandstone is stronger material than assumed in the higher level screening
- Increasing the slope from 3.5H:1V to 3H:1V reduces material quantity and construction time



Water Supply Roadmap – Next Steps & Schedule

- Continue to pursue short term projects
- Provide costs for conveyance and storage ~**August**
- Conveyance preferred alternative ~**August/September**
- Storage preferred alternative ~**September**
- Project selection & prioritization ~**September/October**