BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD POLICY COMMITTEE MEETING

April 2, 2026

Correspondence and media coverage of interest between March 19, 2026 and April 2, 2026

From:	Peter Drekmeier, Yosemite Rivers Alliance Policy Director
To:	BAWSCA Board of Directors
Date:	April 2, 2026
Subject:	Water Affordability: Overestimated Demand, Rapidly Growing Capital Expenses and Misleading Rationing Projections.

From:	Dave Warner
To:	BAWSCA Board Members
Date:	April 2, 2026
Subject:	The SFPUC's rationing projections hurt trust and transparency

From:	Dennis J. Herrera, SFPUC General Manager
To:	Assembly Member Diane Papan Assembly Member Catherine Stefani Assembly Member Matt Haney
Date:	March 31, 2026
Subject:	January 15, 2026 Request for a Formal Comparative Evaluation of the San Francisco Public Utilities Commission (SFPUC) 2025 Millbrae Operations Center Proposal ("2025 Proposal") against Alternatives

From:	Peter Drekmeier, Yosemite Rivers Alliance Policy Director
To:	BAWSCA Board of Directors
Date:	March 19, 2026
Subject:	Revisiting Design Drought

Water Supply Conditions:

Date:	April 1, 2026
Source:	Department of Water Resources
Article:	SNOW SURVEY: Record hot, dry march wipes out California snowpack, leaving no measurable snow for April survey

Date:	April 1, 2026
Source:	San Francisco Chronicle
Article:	Here's what California's dismal snowpack means for the state's future

Water Supply Management:

Date:	March 31, 2026
Source:	AgNet News
Article:	California Water Challenges Take Center Stage as Experts Call for Urgent Action

Water Supply Management, cont'd.:

Date:	March 30, 2026
Source:	Union of Concerned Scientists
Article:	Heated Rivalry: Snowpack Vs. Climate Change. Guess Who Wins

Technology:

Date:	April 1, 2026
Source:	Maven
Article:	A clearer view: The first seamless elevation map of the Bay Delta

Date:	March 28, 2026
Source:	ABC 7
Article:	Bay Area weather radar network aims to improve storm forecasting, flood and drought planning

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April 2, 2026

Chair Louis Vella and Directors
BAWSCA
bawscaboardofdirectors@bawsca.org

Re: Water Affordability: Overestimated Demand, Rapidly Growing Capital Expenses and Misleading Rationing Projections.

Dear Chair Vella and BAWSCA Directors:

Ratepayers are getting hit with affordability problems left and right. Between overestimating demand and water sales, growing capital needs, and now alarmist, misleading rationing projections, the affordability risk is only increasing.

$10 Billion in Additional Capital Expenses

I found the following comment recorded in the February 11, 2026 BAWSCA Board Policy Committee meeting notes to be quite alarming:

> "Beyond the 10-Year CIP, SFPUC estimates approximately $10.1 billion of capital improvement projects over the next 30 years…For comparison, Mr. Francis referenced the Water System Improvement Program (WSIP) which has a total cost of $4.8 billion..."

The WSIP cost $4.8 billion plus debt service. As a result of the price tag, water rates have quadrupled since 2008, and we'll still be paying off the debt for quite some time.

Has the unexpected $10 billion in additional capital costs been factored into future rates, and how will those higher rates impact demand? How will the ensuing decrease in demand affect further rate increases?

Alarmist Rationing

We obviously have to do everything possible to rein in water rates. One of the main drivers of increasing rates that could easily be rectified is perceived water supply shortages that won't occur.

Unfounded fear of running out of water can lead to unnecessary rationing, which reduces the amount of water the SFPUC sells. In a fixed-cost system, selling less of a product means the unit price must increase. We're seeing this now with the surprise 7.4% wholesale water price increase.

Even worse is investing in expensive alternative water supplies that won't be needed.

The SFPUC has the most reliable water supply in the state. This is largely due to: 1) ample storage (enough reservoir capacity to hold six years-worth of water), and 2) exceptional water rights in Wet, Normal and Below Normal years (in an average year, the SFPUC is entitled to three years-worth of water).

I'm concerned about language provided by the SFPUC for inclusion in the BAWSCA member agencies' Urban Water Management Plans (UWMP). Specifically, Table 4e, focusing on water supply availability during a five dry-year sequence.

The Department of Water Resources' 2025 UWMP Guidebook references Water Code Section 10631 (b)(1), which requires "A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years..."

<u>How Is the SFPUC Framing Water Supply?</u>

In the SFPUC letter to the BAWSCA member agencies, Steve Ritchie explains how the SFPUC opted to calculate their Five-Year Drought Risk Assessment:

> "In each demand scenario for 2030 through 2050, the SFPUC estimated RWS deliveries using the standard SFPUC procedure, which includes adding increased levels of rationing as needed in dry years to balance the demands on the RWS with available water supply. **The five consecutive dry-year sequence shown in the tables below represent years 2 through 6 of the design drought**. The SFPUC chose this sequence because year 2 is the first year in which system-wide water use reductions could take effect, as the design drought sequence generally begins year 1 with full reservoirs. All simulations that the SFPUC has prepared for its 2025 UWMP have increased levels of rationing in the final years of the design drought sequence. The SFPUC has presented the results in the standardized format prescribed by DWR."

<u>What's Left Unsaid?</u>

Table 8-3 below is from the SFPUC's Draft 2050 Urban Water Management Plan (UWMP). The red boxes were added to focus on projected water availability in 2050. You'll see that the SFPUC suggests they would only be able to provide 57% of baseline water demand in Years 2 through 5 of a five-year drought sequence if the Bay Delta Water Quality Control Plan is implemented. What's hidden from this table is how the SFPUC calculated their numbers.

Table 8-3. Regional Water System Supply Availability During Normal and Dry Years for Base Years 2030 through 2050 – With Bay-Delta Plan Amendment

Base Year	Normal Year	Single Dry Year	Dry Year 1	Dry Year 2	Dry Year 3	Dry Year 4	Dry Year 5
2030	100%	75%	75%	63%	63%	63%	63%
2035	100%	74%	74%	63%	63%	63%	63%
2040	100%	72%	72%	61%	61%	61%	61%
2045	100%	70%	70%	59%	59%	59%	59%
2050	100%	68%	68%	57%	57%	57%	57%

Source: SFPUC Draft 2050 UWMP

Note that Table 8-3 does not show how much water is left in storage at the end of each year, making it nearly impossible to determine whether the extreme level of rationing they use is justified. Table YRA-1 below puts things in greater perspective. It features the full eight years of the Design Drought and includes storage at the end of each year based on the rationing levels used in SFPUC Table 8-3 to produce "available water supply."

Table YRA-1. 8-year Design Drought, with the Bay Delta Plan in effect, using SFPUC 2050 demand projections, and including storage.

Design Drought Fiscal Years

	86-87	87-88	88-89	89-90	90-91	91-92	92-76	76-77
Water available to RWS (mgd)	215.1	146.3	122.6	122.6	122.6	122.6	122.6	122.6
Mgd converted to 1,000 acre-feet (TAF)	241	164	137	137	137	137	137	137
Annual impact on storage (TAF)	-469	-263	+41	-206	-14	-159	-208	-192
Total SFPUC storage at end of year (TAF)	1,048	785	826	620	606	447	239	47

Source: Yosemite Rivers Alliance (using data provided by the SFPUC).

- "RWS" is "Regional Water System" (includes all SFPUC customers in San Francisco, San Mateo, Santa Clara and Alameda Counties).
- Columns represent the fiscal years of the Design Drought (July 1 to June 30), which is what the SFPUC uses. The column labeled "92-76" represents the second half of 1992 and the first half of 1976. This is the artificial year when the two droughts that make up the Design Drought are melded.
- Table starts with SFPUC 2050 UWMP baseline demand of 215.1 mgd in 1986-87, and assumes 32% rationing in Year 2, and 43% rationing in Years 3-8 (per rationing figures used to produce water supply availability in SFPUC Table 8-3). Mgd is converted to thousand acre-feet (TAF) per year in the second row.
- Storage at the beginning of the Design Drought is 1,517 TAF (per the SFPUC's model).
- "Annual impact on storage" is a calculation of SFPUC water entitlements, minus deliveries, minus other system losses (everything is accounted for).

Under the SFPUC Design Drought scenario, at the end of the first five consecutive dry years the SFPUC would still have more than 600 thousand acre-feet (TAF) of water remaining in storage – enough water to last 2.5 years (not including water entitlements that would accrue during those years). If the Design Drought weren't so severe (it's 19 times less likely to occur than what Valley Water and EBMUD plan for), most of the water left in storage during the latter part of the Design Drought could be used in prior years, reducing the need for severe rationing.

What if the SFPUC Stuck to the UWMP Guidebook?

Table YRA-2 below shows what the five consecutive dry year sequence would look like if the SFPUC followed the letter of the UWMP Guidebook and just looked at the driest five-year sequence. You see that without any rationing, the SFPUC could manage the five consecutive dry years, with the Bay Delta Plan in effect, and still have water remaining in storage. In fact, almost enough water in storage to last a sixth dry year.

Table YRA-2 – Regional Water System supply availability based on the six-year drought of record using the SFPUC's 2050 baseline demand projection of 215.1 mgd. Table assumes the Bay Delta Plan is in effect. Table **does not incorporate any rationing.**

	86-87	87-88	88-89	89-90	90-91	91-92
Projected 2050 RWS demand (mgd)	215.1	215.1	215.1	215.1	215.1	215.1
Demand converted to 1,000 acre-feet (TAF)	241	241	241	241	241	241
Annual impact on storage (TAF)	-469	-340	-63	-310	-118	-263
Total SFPUC storage at end of year (TAF)	1,048	708	645	335	217	-46

Source: Yosemite Rivers Alliance (using data provided by the SFPUC).

After the driest five-year sequence on record, the SFPUC would still have 217 TAF of water in storage. Instead of showing only 68% of required water supply available in Year 1 and 57% in Years 2 through 5, Table 8-3 (your Table 4e) would show that 100% of demand could be met in all five years, and this is without any rationing.

Table YRA-3 is similar to Table YRA-2, except it assumes 10% rationing in Years 3 and 4, and 20% rationing in Years 5 and 6. Note that in this scenario the SFPUC can manage the driest consecutive six-year sequence (the drought of record), exceeding the UWMP requirement.

Table YRA-3 – SFPUC water supply based on the drought of record, using SFPUC 2050 UWMP demand projections, with the Bay Delta Plan in effect. 10% rationing in Years 3 and 4, and 20% rationing in Years 5 and 6.

	86-87	87-88	88-89	89-90	90-91	91-92
Water available to RWS (mgd)	215.1	215.1	193.6	193.6	172.1	172.1
Demand converted to 1,000 acre-feet (TAF)	241	241	217	217	193	193
Annual impact on storage (TAF)	-469	-340	-39	-286	-70	-215
Total SFPUC storage at end of year (TAF)	1,048	708	669	383	313	98

Source: Yosemite Rivers Alliance (using data provided by the SFPUC).

Is the Design Drought a Prudent Drought Planning Tool? What We Know about Design Drought Risk

To determine whether the Design Drought is justified, it's important to understand how likely it is to occur. Planning for a drought that is not conservative enough can lead to water shortages. Planning for a drought that is too conservative can lead to unnecessary rationing or investments in very expensive alternative water supplies. Understanding the return period of a drought – how many years might pass between occurrences – is critical to sound planning.

The following table is from the SFPUC's Long-Term Vulnerability Assessment (LTVA). It shows return periods for the three most severe observed droughts. The report found "no clear direction of change in mean annual precipitation over the planning horizon," which is why the first set of numbers is highlighted (red box added). Note that these return periods are based on Regional Water System (RWS) demand of 269 thousand acre-feet, which is 240 million gallons per day (demand last year was 191 mgd).

Table 5-1. Effect of Precipitation and Temperature Change on the Return Periods Associated with the Severity of the Historic Droughts.
Return periods are round off to the nearest 5 years.

Threshold [TAF]	Drought Event	Changes in Precipitation			Changes in Temperature [°C]		
		0%	-10%	-20%	0	+2	+4
269	1976-1977	100	45	25	100	105	130
	1987-1992	420	120	45	420	495	675
	2012-2015	180	70	35	180	200	260

Source: LTVA, p. 157

We've asked many times why the LTVA did not include a return period for the Design Drought, and have been told by SFPUC staff that such a calculation would be unreliable.

However, through a Public Records Act request, we received the following table from a presentation given by the LTVA authors to SFPUC staff in December 2020, one year prior to the release of the final LTVA. The severity of SFPUC droughts is measured by "Deficit" (how much water must come out of storage), which is why the 25,293-year return period is circled. Note that the deficit for the Design Drought is 1,309 thousand acre-feet (TAF), compared to significantly shorter return periods for the known droughts. The 1987-92 drought has a return period of 797 years, making it the most severe drought on record (this is what Valley Water and EBMUD use for drought planning). Like Table 5-1 above, the figures below are based on RWS demand of 240 mgd.

Return periods of historical drought

Drought Event	Deficit (TAF)	Duration (Year)	Return Period (Year) (best estimate and 95% confidence interval)		
			Deficit	Duration	Deficit and Duration
1976-77	517	2	217 (188; 255)	30 (29; 31)	316 (273; 371)
1987-92	797	6	1,456 (1,031; 2,140)	486 (422; 563)	20,406 (14,589; 29,851)
2012-16	752	4	1,093 (820; 1,520)	121 (110; 133)	4,250 (3,190; 5,899)
Design Drought	1,309	8	25,293 (12,940; 56,679)	1,954 (1,620; 2,376)	1,371,578 (720,390; 2,997,390)

Source: "Hydrological Drought Frequency Analysis for the Upper Tuolumne River," 12/8/2020

SFPUC staff were quick to point out that the return periods in the draft table were adjusted downward quite significantly for the final LTVA (Table 5-1). Therefore, we adjusted the 25,293 figure proportionally. The following table shows the result.

Drought Event	2020 Report	LTVA	LTVA / 2020
1976-77	217	98	45%
1987-92	1,456	420	29%
Combined	1,673	518	31%
Design Drought	25,293	7,841*	31%

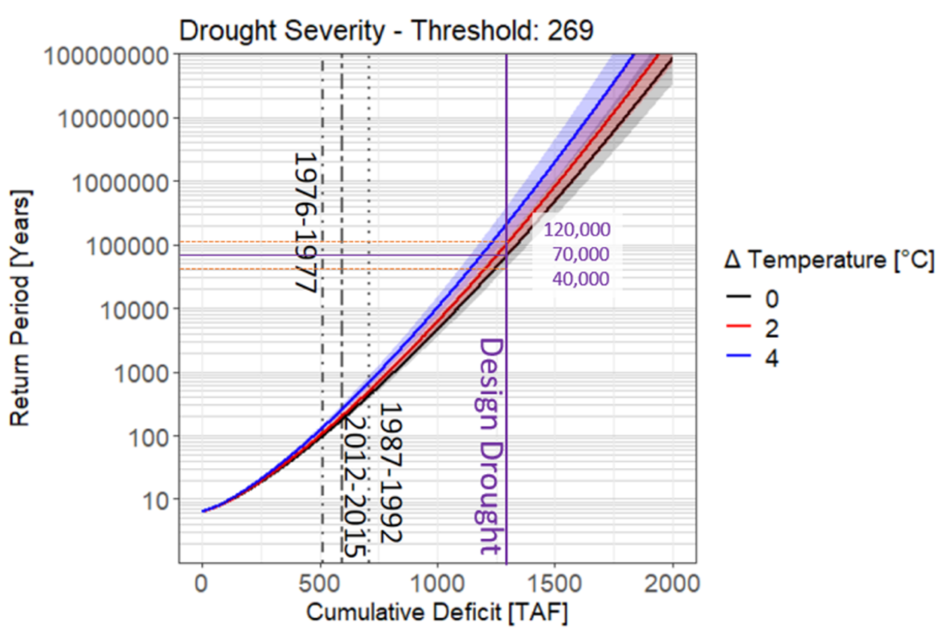
Source: Yosemite Rivers Alliance

The "2020 Report" column lists the numbers from the draft table, and "LTVA" lists the final numbers. "LTVA/2020" is the percentage of the original numbers that ended up in the final report. The combined Design Drought (1987-92 plus 1976-77) was reduced to 31% of the draft numbers. 31% of 25,293 years is 7,841 years, which is where the once-in-8,000 years return period for the Design Drought originates.

However, once-in-8,000 years is the very low end for the Design Drought return period. You'll see from the graph below that the relationship between Cumulative Deficit and Return Periods is logarithmic. As droughts get more severe, the return period becomes much greater. The deficits for the known droughts are included on this graph. Superimposed on the graph is a line for the cumulative deficit for the Design Drought (1,309 TAF), which suggests a return period of once-in-70,000 years. As a side note, the red and blue lines reflecting higher temperatures expected from climate change are higher than the black line, meaning return periods gets longer as temperatures increase.

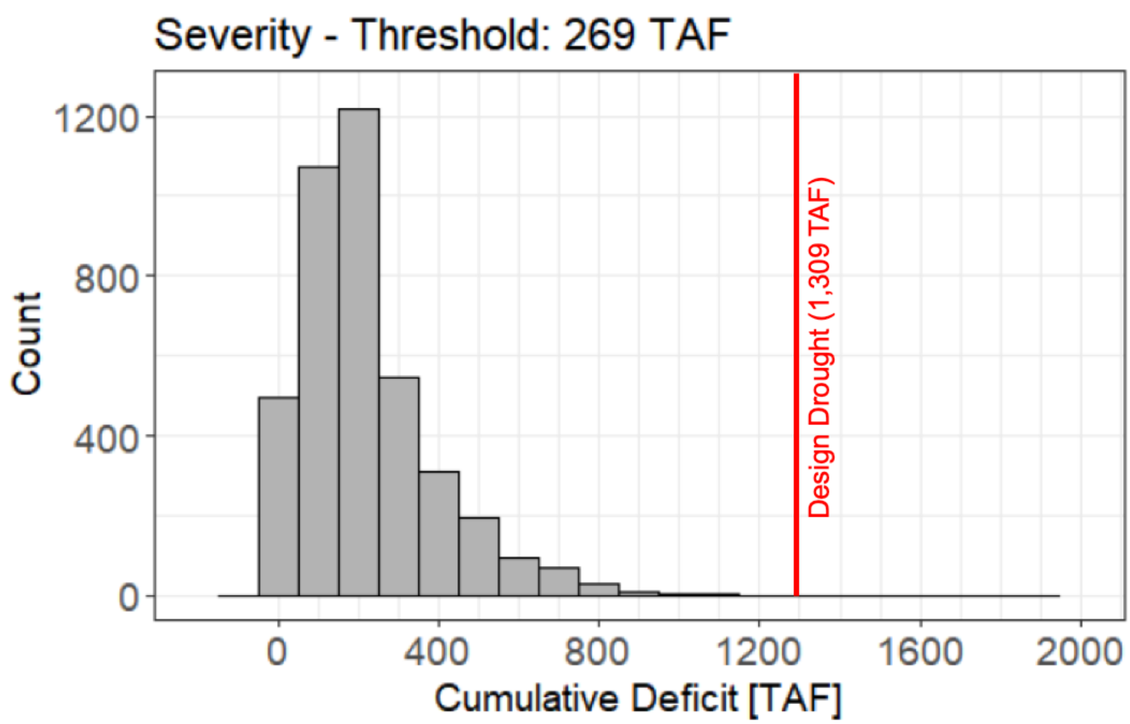
Drought Risk and Storage Needed

(Based on LTVA Figure 5-11, Design Drought Superimposed)



Source: LTVA, p. 157

On the following page is one more example of how the Design Drought is way too extreme and why it should be revised. The graph is based on 100 years of observed data, 1,100 years of tree ring data, and 25,000 years of simulated model data. The horizontal axis depicts drought deficits – the further to the right, the more severe the droughts. The vertical axis depicts the number of droughts. We inserted the red line showing the deficit for the Design Drought (1,309 TAF). You'll see that the LTVA did not identify or produce a single drought even close to the severity of the Design Drought.



Source: LTVA, p. 73

Revising the length and severity of the Design Drought would have a huge impact on Urban Water Management Plans. Please make this an immediate priority. UWMPs are due to the Department of Water Resources by July 1.

Sincerely,

Peter Drekmeier
Policy Director

April 2, 2026

Re: **The SFPUC's rationing projections hurt trust and transparency**

Dear BAWSCA Board members,

The SFPUC's March 11th letter[1] that BAWSCA forwarded to its member agencies showing 40%+ rationing projections for inclusion in their Urban Water Management Plans (UWMP's) puts us in an untrustworthy situation with our constituents. The lay person would read that they could face 40% or more rationing in year two of a drought if the Bay Delta Plan were implemented. As you know, these figures are based on the SFPUC's 8.5 year design drought model.

You would likely acknowledge that scientific data exists suggesting that the design drought could have a chance of occurrence in the range of 0.013% to 0.001% (a return period between 8,000 and 70,000 years). Or perhaps more simply, it is rarer than needed. I think you would also stipulate that the SFPUC has refused to do its own risk analysis on the design drought, as most recently seen by the SFPUC's response to Board member Stone's request last year.

Yet here we are, having to include these alarmist percentages in UWMP's that our cities and agencies will publish.

We could add a disclaimer to the tables to try to help transparency:

> "Rationing percentages are based upon the SFPUC's drought model. While the SFPUC has not provided a risk analysis for the likelihood of occurrence of such a drought, academic research has found the risk to be so rare that it is difficult to quantify its likelihood of occurrence. Should a lesser model be implemented, such as using the worst drought on record plus a modest cushion, the rationing percentages shown would be substantially lower."

However a better answer is to have the SFPUC do a risk analysis on their design drought to enable informed decisions and provide more reasonable data to our constituents.

Please take up the request to have the SFPUC determine design drought risk to improve trust and transparency with our constituents.

Kind regards,

Dave Warner
Attachment

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[1] Attached are both cover page of the letter and the page showing rationing percentages to be used for 2050 in agencies' UWMP's for the scenario when the Bay Delta Plan is in effect.

San Francisco Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

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sfpuc.gov

March 11, 2026

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

This letter contains the supply reliability of the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) that the SFPUC has prepared for the 2025 Urban Water Management Plan (UWMP), which the Wholesale Customers may also use in their respective 2025 UWMPs. The SFPUC has assessed the RWS's supply reliability under the following planning scenarios:

1. Projected supply reliability for years 2030 through 2050, assuming total demand is equivalent to the sum of the projected retail and wholesale demands on the RWS, which includes Wholesale Customer purchase projections provided to the SFPUC by BAWSCA on March 4, 2026 (refer to Table 1 below).
2. Projected supply reliability for 2050, assuming total demand is equivalent to the sum of the projected retail demands on the RWS and the Wholesale Customers' Supply Assurance of 184 MGD.
3. Under each of the above demand conditions, projected supply reliability for the following scenarios: (a) with implementation of the 2018 amendments to the Bay-Delta Water Quality Control Plan (Bay-Delta Plan Amendment) and (b) without implementation of the Bay-Delta Plan Amendment.

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2050, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (MGD)	% of Average Supply	Wholesale Volume Available (MGD)	Notes on Calculation of Wholesale Allocation of RWS
Average year	2050	215.1	100%	148.4	
Single dry year	2050	146.2	68%	91.4	At shortages 20% or greater, wholesale allocation is assumed to be 62.5% and retail allocation is 37.5%.
Consecutive 1st dry year	2050	146.2	68%	91.4	Same as above.
Consecutive 2nd dry year	2050	122.6	57%	76.6	Same as above.
Consecutive 3rd dry year	2050	122.6	57%	76.6	Same as above.
Consecutive 4th dry year	2050	122.6	57%	76.6	Same as above.
Consecutive 5th dry year	2050	122.6	57%	76.6	Same as above.

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2050, With Bay-Delta Plan Amendment <u>and Wholesale Demands at 184 MGD Supply Assurance</u>

Year Type	Base Year	RWS Volume Available (MGD)	% of Average Supply	Wholesale Volume Available (MGD)	Notes on Calculation of Wholesale Allocation of RWS
Average year	2050	250.7	100%	184.0	
Single dry year	2050	145.4	58%	90.9	At shortages 20% or greater, wholesale allocation is assumed to be 62.5% and retail allocation is 37.5%.
Consecutive 1st dry year	2050	145.4	58%	90.9	Same as above.
Consecutive 2nd dry year	2050	120.3	48%	75.2	Same as above.
Consecutive 3rd dry year	2050	120.3	48%	75.2	Same as above.
Consecutive 4th dry year	2050	120.3	48%	75.2	Same as above.
Consecutive 5th dry year	2050	120.3	48%	75.2	Same as above.

68% supply availability = 32% rationing
57% supply availability = 43% rationing

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San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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March 31, 2026

Assembly Member	Assembly Member	Assembly Member
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Sacramento, CA	Sacramento, CA	Sacramento, CA
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Via email to: David.Burruto@asm.ca.gov, Caitlin.Voorhees@asm.ca.gov, Frankie.Falzon@asm.ca.gov, Daniel.herzstein@asm.ca.gov, Abigail.RivamonteMesa@asm.ca.gov, Yasamin.salari@asm.ca.gov

Re: *January 15, 2026 Request for a Formal Comparative Evaluation of the San Francisco Public Utilities Commission (SFPUC) 2025 Millbrae Operations Center Proposal ("2025 Proposal") against Alternatives*

Dear Assembly Members Papan, Stefani, and Haney,

In response to your January 15th letter regarding the 2025 Millbrae Operations Center Proposal, we are providing additional detail regarding our design process and consideration of the project alternatives you referenced.

On March 18, members of my staff met with representatives of the City of Millbrae and BAWSCA at our Millbrae Operations Center. They toured the site and discussed the enclosed comparative review of the 2025 Proposal and the five January 2020 proposals. This includes the proposed final square footage of each proposal and estimated construction costs that were evaluated during this planning process. As with all projects funded by our ratepayers, we conducted a thorough analysis of both operational needs now and into the future, along with a comprehensive review of alternatives and costs. Our operational, infrastructure planning, and management staff spent significant time reviewing proposals, probing assumptions, and confirming both needs and appropriate solutions.

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No agreement was reached at the meeting, but a healthy discussion of the issues occurred. At this point we are going to take the following steps:

- First, the SFPUC is going to pause further work on the 2025 Proposal at 35% design level, which will be achieved this week.

- Second, the SFPUC is going to develop a new alternative, with the goal of meeting our operational efficiency and colocation requirements for the Millbrae Operations Center as a critical component of the Regional Water System, while allowing the OSH retail operations to remain. This alternative, and any cost implications to the Regional Water System customers, will be shared with the City of Millbrae and BAWSCA. We expect to have the new alternative available for review in about three months. We will provide a more detailed schedule to all parties shortly.

This pause and development of an alternative analysis, including the fiscal impact, if any, demonstrates our commitment to transparency and fiscal responsibility in light of Millbrae's stated concerns.

Sincerely,

Dennis J. Herrera
General Manager

cc:

Honorable Daniel Lurie, San Francisco Mayor
Tom Smegal, General Manager, Bay Area Water Supply and Conservation Agency
Louis Vella, Chair, Bay Area Water Supply and Conservation Agency Board of Directors
Joshua Arce, President, San Francisco Public Utilities Commission
Tom Williams, Millbrae City Manager
Steven R. Ritchie, SFPUC, Assistant General Manager, Water

Enclosure: March 18, 2026, Millbrae Operations Center Alternatives Overview

Hetch Hetchy
Regional Water System
Services of the San Francisco Public Utilities Commission

MILLBRAE OPERATIONS CENTER
ALTERNATIVES OVERVIEW
March 18, 2026

Regional Water System facilities planning began in 2010 and has been ongoing ever since. Due to operational considerations and facility conditions, construction of the Sunol Yard facility long-term improvements were prioritized over upgrades for the Millbrae Operations Center.

Planning, Studies, Alternatives

2019: Focused Millbrae Operations Center planning began in earnest in 2019, assuming no expansion of the existing facility footprint, but recognized it was a possibility. In addition to costs, all studies needed to consider operational needs, efficiency, as well as maintaining 24 hours a day, 7 days a week Regional System operations during construction.

January 2020: This work culminated in a DRAFT January 21, 2020 Alternatives Planning Study.

- Alternative 1 of that Study included moving staff from Rollins Road to Millbrae, although in a subsequent May 7, 2020 discussion, Rollins Road improvements were considered, either as permanent or long-term interim items. The Alternatives Planning Study was never finalized but remained as a Draft document because definition of space programming for the various functions continued to be refined.
- With the Orchard Supply Hardware closed and vacant and the amount of time needed to complete planning, design and procurement of a contractor, we elected to give the new Outdoor Supply Hardware a 5-year lease to keep the building and South Tenant parcel areas maintained and in operation, and in consideration of the City of Millbrae's interest in maintaining a retail tenant.

May 2020: We were looking at conceptual alternatives for the Millbrae Yard. At that time, we also evaluated seismic and other retrofits for the Rollins Road building. The cost of those retrofits was estimated to be around $22,000,000, and the staff would need to be relocated to temporary space for at least 2 years. Thus, in May 2020, the seismic and other retrofits of the Rollins Road building were rejected because of cost and challenges of staff relocation (and cost). Basic amenity and security improvements were made to last until the planned relocation to Millbrae.

March 2021: Staff discussion and investigation then revisited operational space needs accounting, finalizing a March 2021 programming document.

September 2022: It became apparent in space programming discussions between May 2020 and September 2022 that expansion of the Millbrae Operations Center was necessary to provide safe and efficient workspaces for staff to operate and maintain the Regional Water System. The decision was made to incorporate the OSH and South tenant parcel areas into the project scope and first presented internally in October 2022.

July 2023: Between October 2022 and July 2023 various options were reviewed that included demolition of the existing Administration Building. In response to cost reduction goals, we began to explore retaining the existing Administration Building. This led to the concept of a new building at the north end of the site along with refurbishment of the existing Administration Building. Final confirmation of this concept came in late September 2023.

Early 2024-2025: A preferred site plan was coming into focus, leading to what is now referred to in this document as Alternative 2025.

Alternatives Review

The following pages, prepared in early 2026, are a summary and comparison of the draft 2020 alternatives and the 2025 alternative. The alternatives were given scores for four criteria – operations, cost, environmental, and constructability – which are typically used to analyze alternatives. The analysis shows that although the 2025 alternative had the highest cost and required the use of the OSH tenant area, it was the only alternative that met operations and consolidation requirements, did not have significant environmental impacts, and did not have any major constructability issues.

<u>Evaluation Criteria</u>

- Operations – Suitability/operability of improvements.
- Cost – Estimated capital cost. Life cycle and operations costs are not included in this evaluation.
- Environmental – Environmental factors considered for CEQA review.
- Constructability – Construction complexity and risks.

<u>Scoring Scale</u>

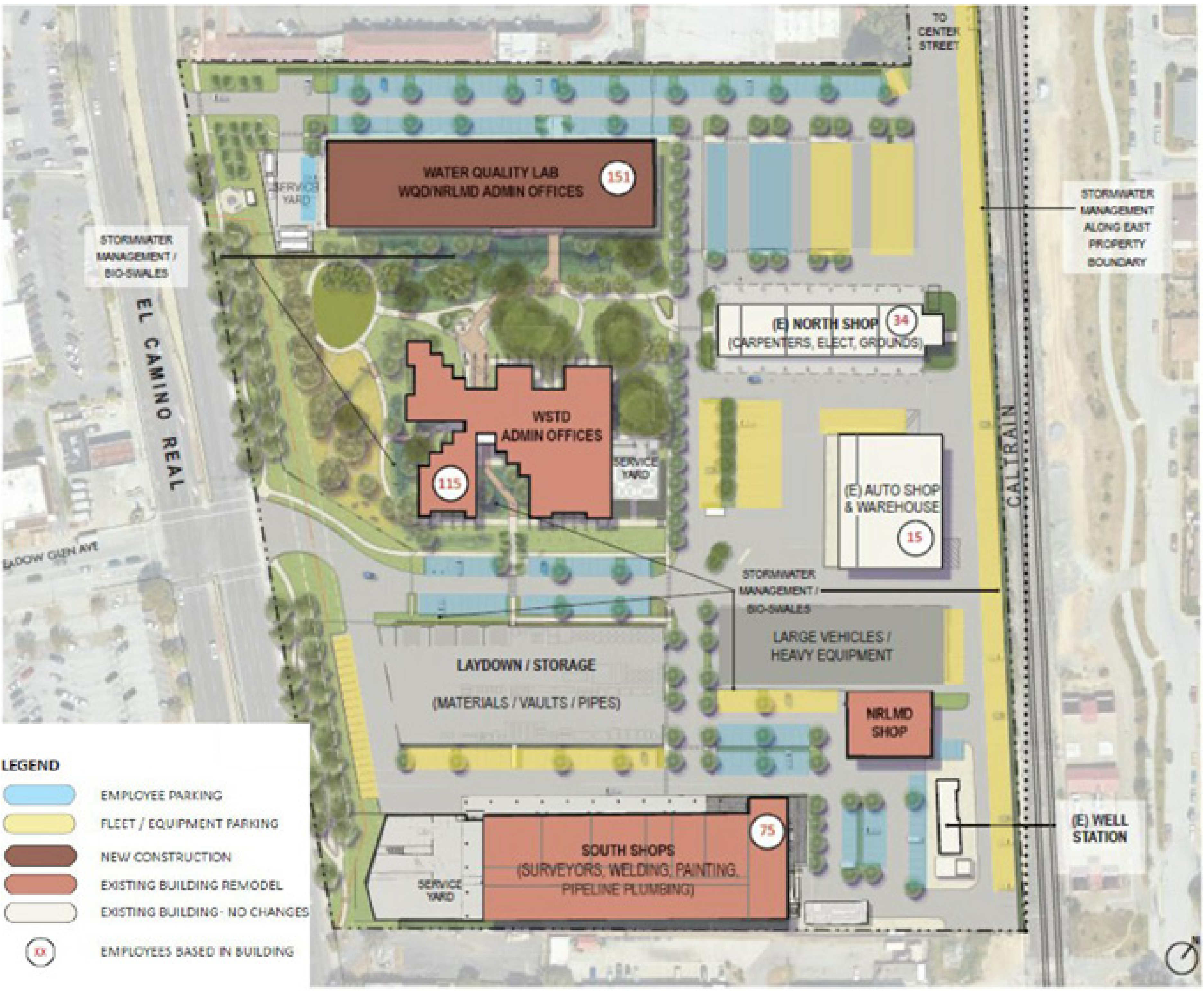
From 0 to 10, with 10 being the most favorable and 0 being the least favorable.

<u>Notes on Alternatives:</u>

[a] Overall footprint is 35,820 SF, which includes shops and covered material storage (16,871 SF).
[b] Does not include costs for FF&E, security, IT, art enrichment, phasing, and market conditions.
[c] Since this alternative does not meet operational requirements, it has a fatal flaw and would not have been considered to be a viable alternative to move forward for scoring.
[d] See below table for the expected accuracy ranges per AACE (Association for the Advancement of Cost Engineering) cost estimating standards.

Cost Estimation Guide:

Estimate Class	Maturity Level of Project Definition Deliverables	Expected Accuracy Range
Class 5	0% to 2% Project Definition	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15% Project Definition	H: +30% to +100% L: -15% to -30%
Class 3	10% to 40% Project Definition	H: +20% to +50% L: -10% to -20%
Class 2	30% to 75% Project Definition	H: +10% to +30% L: -5% to -15%
Class 1	65% to 100% Project Definition	H: +5% to +20% L: -3% to -10%



Alternative 2025

- New Lab Building
- Remodel Admin Building
- WSTD Storage Re-Use
- Re-Purpose OSH Store into South Shops
- Covered and Open Storage/Lay Down Area

Proposed Improvements	Area (SF)
New Water Quality Lab Building	57,985
New South Shop	18,949[a]
New Water Supply Admin Building	-
Remodeled Water Supply Admin Building	25,310
WSTD Storage Re-Use	7,440
Covered Equipment Storage	12,000
Covered Material Storage	16,871
Exterior Storage and Lay Down Area	37,500
Re-Use Water Supply Admin Building with Lab Renovation and Addition	-
Total New or Remodeled Office/Lab Area	83,295
Total New Workshop/Storage/Staging Area	92,760
Total Area	176,055
Construction Schedule	2027 to 2032
Estimated Project Cost	$428,000,000
Cost Estimate Class[d]	Class 4

Scoring

Scoring		
Operations	10	• Meets current and future operational workspace needs • Provides consolidated, efficient workspace • Provides sufficient shop space • Provides sufficient lab space • Minimizes disruption to operations
Cost	5	• Highest capital cost to achieve goals but is not unaffordable
Environmental	6	• Moderate CEQA review • Requires a Mitigated Negative Declaration • Provides installations of a significant number of trees, landscaping, screening, and public artwork along El Camino
Constructability	6	• Will need to relocate admin staff temporarily to Rollins Rd. facility to complete construction on admin building (Rolllins Rd. facility will be vacant since staff will be moved into the new lab building) • Maintains operational functionality during construction
Total Score	27	

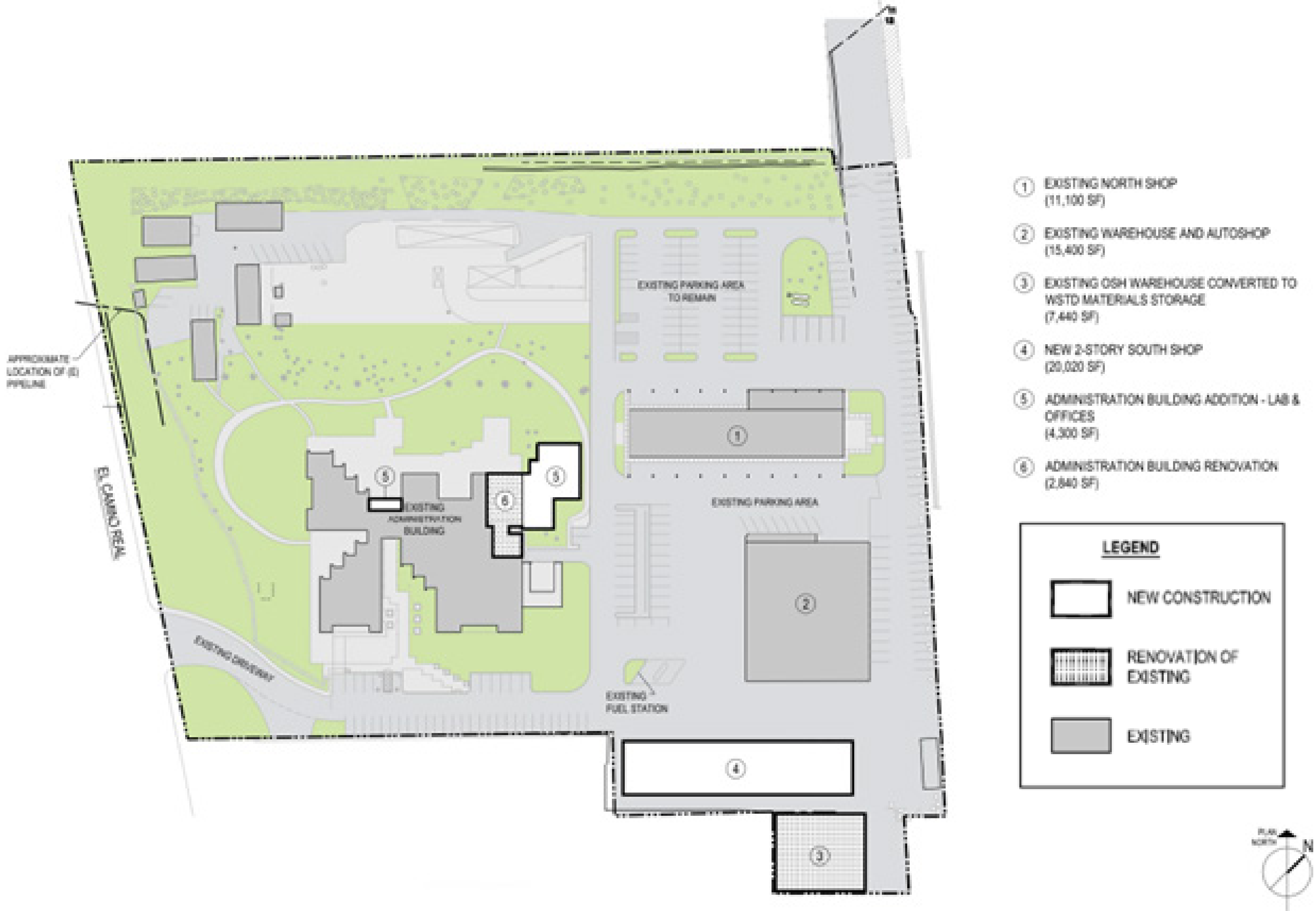
Alternative 1 (2020)

- New Lab Building
- New Admin Building
- New 1-Story South Shop
- WSTD Storage Re-Use Covered Storage

Proposed Improvements	Area (SF)
New Water Quality Lab Building	28,800
New South Shop	12,800
New Water Supply Admin Building	45,000
Remodeled Water Supply Admin Building	-
WSTD Storage Re-Use	7,440
Covered Equipment Storage	23,800
Covered Material Storage	21,280
Exterior Storage and Lay Down Area	-
Re-Use Water Supply Admin Building with Lab Renovation and Addition	-
Total New or Remodeled Office/Lab Area	73,800
Total New Workshop/Storage/Staging Area	65,320
Total Area	139,120
Construction Schedule	2024 to 2036
Estimated Project Cost	$371,261,995[b]
Cost Estimate Class[d]	Class 5

Scoring

Operations	7	• Does not fully meet current and future operational workspace needs • Scattered storage areas and workspaces are inefficient • Does not provide consolidated storage space • Amount of shop space is insufficient • Does not have covered hazmat storage area • Amount of storage/staging area is insufficient • There may not be sufficient turning radiuses for large trucks • Provides sufficient lab space • Requires shutdown and relocation of SFPUC's 60" diameter CSPL2 that runs along El Camino
Cost	6	• High capital cost with project goals not fully achieved
Environmental	5	• Likely moderate CEQA review • Likely Mitigated Negative Declaration • Removal of significant redwood trees with a small amount of new greenspace • No new trees or major landscaping improvements along El Camino due to relocated CSPL2 • Potential damage to historic building due to proximity of heavy construction could require an EIR
Constructability	4	• Will need to relocate staff in NRLMD trailers for construction of new building • Will need to procure office space for admin staff to temporarily relocate to demolish admin building • Will require temporary relocation or coordination of night/weekend work at the lab • Major construction near historic meter house • Operational workspace and functionality will be limited during construction • Requires several moves of staff, equipment and materials • Construction of multiple, scattered covered storage areas is inefficient
Total Score	22	



Alternative 2 (2020)

- Addition and remodel at Admin Building for Lab
- New 2-Story South Shop
- WSTD Storage Re-Use

Proposed Improvements	Area (SF)
New Water Quality Lab Building	-
New South Shop	20,020
New Water Supply Admin Building	-
Remodeled Water Supply Admin Building	-
WSTD Storage Re-Use	7,440
Covered Equipment Storage	-
Covered Material Storage	-
Exterior Storage and Lay Down Area	-
Re-Use Water Supply Admin Building with Lab Renovation and Addition	29,610
Total New or Remodeled Office/Lab Area	57,070
Total New Workshop/Storage/Staging Area	20,020
Total Area	37,050
Construction Schedule	2022 to 2025
Estimated Project Cost	$146,892,200[b]
Cost Estimate Class[d]	Class 5

[c] *Since this alternative does not meet operational requirements, it has a fatal flaw and would not have been considered to be a viable alternative to move forward for scoring.*

Scoring		
Operations	0[c]	• Does not meet current and future operational workspace needs • Does not provide consolidated storage space • Scattered storage areas and workspaces are inefficient • Does not provide sufficient shop space • Does not have covered hazmat storage area • Does not provide sufficient lab space or allow for consolidation of Rollins Rd staff
Cost	8	• Low capital cost with project goals not achieved
Environmental	8	• Likely simpler CEQA review • Likely Categorical Exemption
Constructability	7	• Will require temporary relocation or coordination of night/weekend work at the lab
Total Score	23	

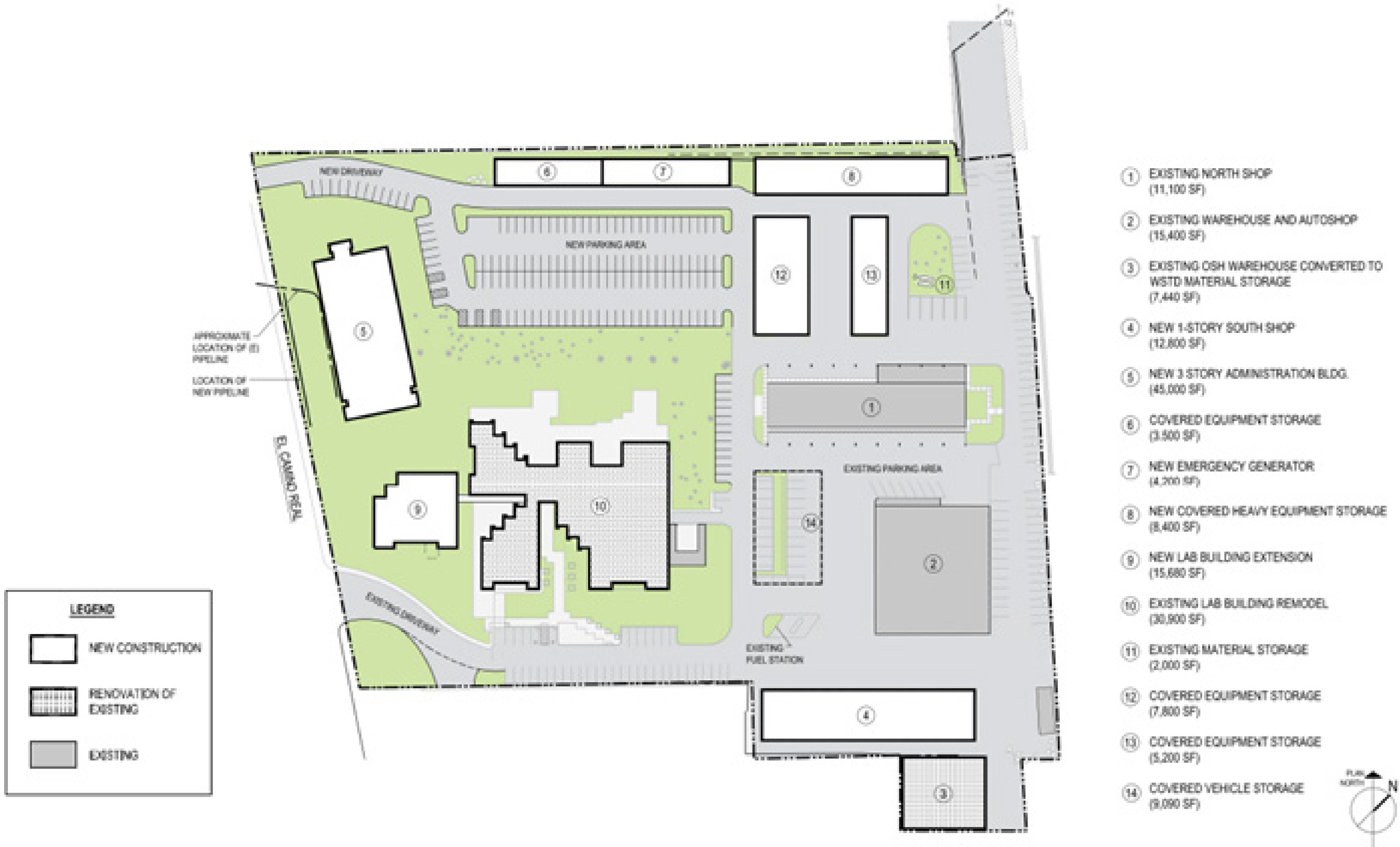
Alternative 3 (2020)

- New Lab Building
- New Admin Building
- New 1-Story South Shop
- WSTD Storage Re-Use Covered Storage

Proposed Improvements	Area (SF)
New Water Quality Lab Building	45,000
New South Shop	12,800
New Water Supply Admin Building	45,000
Remodeled Water Supply Admin Building	-
WSTD Storage Re-Use	7,440
Covered Equipment Storage	23,800
Covered Material Storage	21,280
Exterior Storage and Lay Down Area	-
Re-Use Water Supply Admin Building with Lab Renovation and Addition	-
Total New or Remodeled Office/Lab Area	90,000
Total New Workshop/Storage/Staging Area	65,320
Total Area	155,320
Construction Schedule	2022 to 2026
Estimated Project Cost	$306,776,468[b]
Cost Estimate Class[d]	Class 5

Scoring

Operations	8	• Does not fully meet current and future operational workspace needs • Storage/staging area is insufficient • Scattered storage areas and workspaces are inefficient • Does not provide sufficient shop space • There may not be sufficient turning radiuses for large trucks • Does not have covered hazmat storage area • Requires shutdown and relocation of SFPUC's 60" diameter CSPL2 that runs along El Camino • Provides sufficient lab space
Cost	7	• Moderately high capital cost with project goals not fully achieved
Environmental	5	• Likely moderate CEQA review • Likely Mitigated Negative Declaration • Removal of significant redwood trees with a small amount of new greenspace • No new trees or major landscaping improvements along El Camino due to relocated CSPL2 • Potential damage to historic building due to proximity of heavy building construction could require an EIR
Constructability	3	• Will need to procure office space for admin staff to temporarily relocate to demolish admin building • Major construction near historic meter house • Operational workspace and functionality will be limited during construction • Requires several moves of staff, equipment and materials • Construction of multiple, scattered covered storage areas is inefficient
Total Score	23	



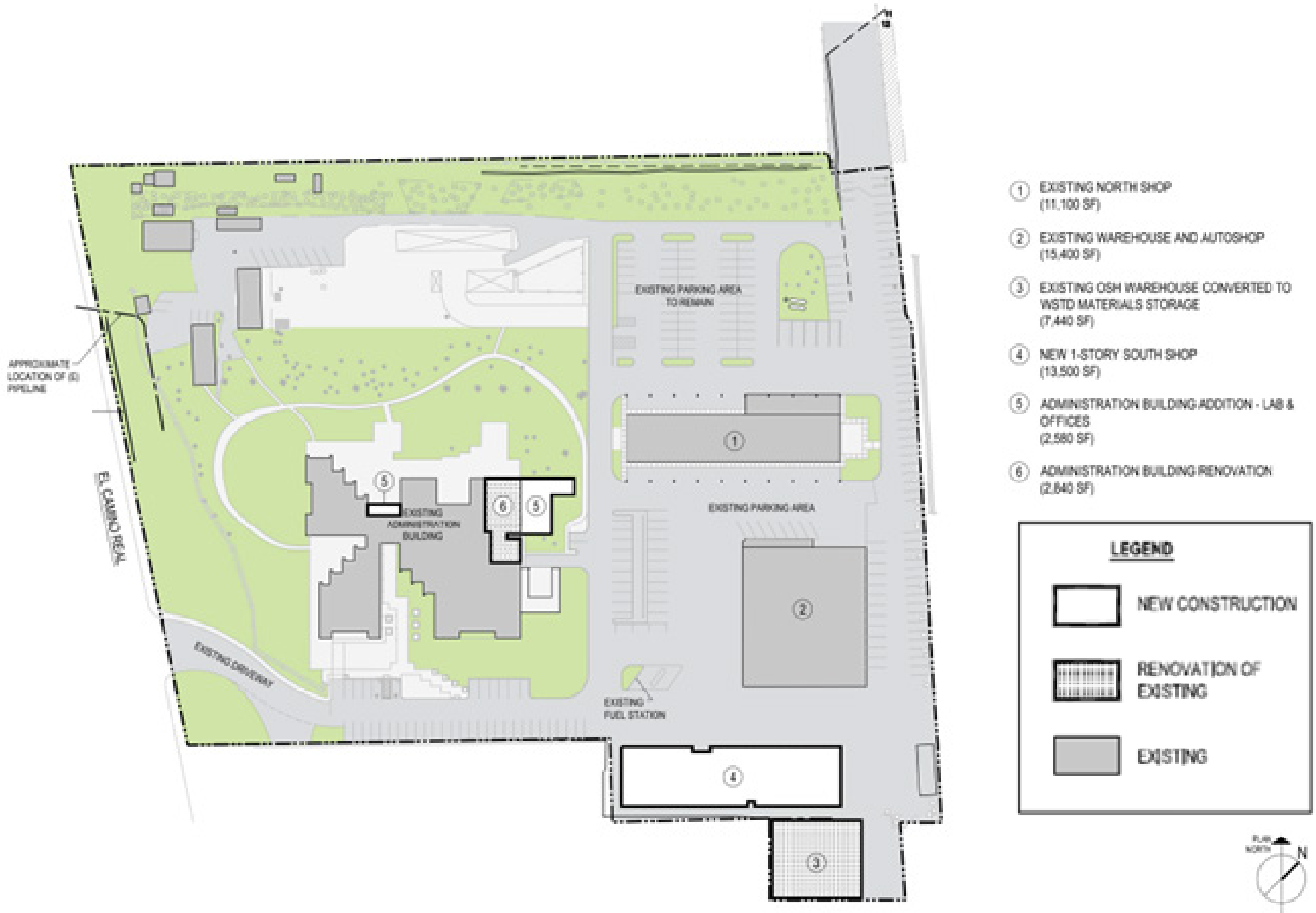
Alternative 4 (2020)

- Convert Admin Building into Lab Building
- New Admin Building
- New 1-Story South Shop
- WSTD Storage Re-Use Covered Storage

Proposed Improvements	Area (SF)
New Water Quality Lab Building	-
New South Shop	12,800
New Water Supply Admin Building	45,000
Remodeled Water Supply Admin Building	-
WSTD Storage Re-Use	7,440
Covered Equipment Storage	24,900
Covered Material Storage	-
Exterior Storage and Lay Down Area	-
Re-Use Water Supply Admin Building with Lab Renovation and Addition	30,900
Total New or Remodeled Office/Lab Area	75,900
Total New Workshop/Storage/Staging Area	45,140
Total Area	121,040
Construction Schedule	2022 to 2026
Estimated Project Cost	$331,797,100[b]
Cost Estimate Class[d]	Class 5

Scoring

Operations	4	• Does not fully meet current and future operational workspace needs • Scattered storage areas and workspaces are inefficient • Does not provide consolidated storage space • Storage/staging area is insufficient • Does not provide sufficient shop space • Does not have covered hazmat storage area • There may not be sufficient turning radiuses for large trucks • Requires shutdown and relocation of SFPUC's 60" diameter CSPL2 that runs along El Camino • Provides sufficient lab space
Cost	7	• Moderately high capital cost with project goals not fully achieved
Environmental	5	• Likely moderate CEQA review • Likely Mitigated Negative Declaration • Removal of significant redwood trees • No new trees or major landscaping improvements along El Camino due to relocated CSPL2 • Potential damage to historic building due to proximity of heavy building construction could require an EIR
Constructability	5	• Will need to relocate staff in NRLMD trailers for construction of new building • Major construction near historic meter house • Operational workspace and functionality will be limited during construction • Requires several moves of staff, equipment and materials • Construction of multiple, scattered covered storage areas is inefficient
Total Score	21	



Alternative 5 (2020)

- Addition and remodel at Admin Building for Lab
- New 1-Story South Shop
- WSTD Storage Re-Use

Proposed Improvements	Area (SF)
New Water Quality Lab Building	-
New South Shop	13,500
New Water Supply Admin Building	-
Remodeled Water Supply Admin Building	-
WSTD Storage Re-Use	7,400
Covered Equipment Storage	
Covered Material Storage	
Exterior Storage and Lay Down Area	
Re-Use Water Supply Admin Building with Lab Renovation and Addition	27,890
Total New or Remodeled Office/Lab Area	27,890
Total New Workshop/Storage/Staging Area	20,940
Total Area	37,050
Construction Schedule	2022 to 2025
Estimated Project Cost	$131,882,400[c]
Cost Estimate Class[d]	Class 5

[c] *Since this alternative does not meet operational requirements, it has a fatal flaw and would not have been considered to be a viable alternative to move forward for scoring.*

Scoring		
Operations	0[c]	• Does not meet current and future operational workspace needs • Scattered storage areas and workspaces are inefficient • Does not provide consolidated storage space • Storage/staging area is insufficient • Does not have covered hazmat storage area • Requires shutdown and relocation of SFPUC's 60" diameter CSPL2 that runs along El Camino • Does not provide sufficient lab space or allow for consolidation of Rollins Rd staff
Cost	8	• Lowest capital cost with project goals not achieved
Environmental	8	• Likely simpler CEQA review • Likely Categorical Exemption
Constructability	8	• Will require temporary relocation or coordination of night/weekend work at the lab
Total Score	24	

Lourdes Enriquez

From:	Peter Drekmeier <peter.drekmeier@yosemiterivers.org>
Sent:	Thursday, March 19, 2026 11:08 AM
To:	bawscaboardofdirectors
Cc:	Tom Smegal; Tom Francis
Subject:	Design Drought Impact on Water Rates
Attachments:	Revisiting the Design Drought.pdf

Dear Chair Vella and BAWSCA Directors,

The purpose of the attached document is to point out that drought planning has a huge impact not just on the environment, but on water rates as well.

I don't expect most of you to understand all the details, but I hope you will ask staff to take a look and either confirm or challenge the conclusion:

If the SFPUC planned for the same drought Valley Water and EBMUD use, they could manage this drought, with the Bay Delta Plan flow requirement in place, and using the 2050 UWMP RWS demand projections (likely high), by requiring 10% rationing in Years 3 and 4 and 20% rationing in years 5 to 6.5, without developing any new expensive alternative water supplies.

This isn't to suggest that the SFPUC should immediately shift from their 8.5-year Design Drought to a 6.5-year drought, but it demonstrates that the severity of the drought being planned for has tremendous influence over environmental stewardships and rates. There's a trade-off.

I encourage BAWSCA to explore alternative scenarios and not simply accept the SFPUC's drought plan that was conceived more than 30 years ago under very different conditions. Much has changed, including water demand has decreased by more than 30%, the SFPUC adopted its Water First policy (prioritizing water supply over hydropower generation), and we understand the potential impacts of climate change much better (no clear change in mean annual precipitation).

Thank you for considering my comments.

-Peter

Please note my new email address.

Peter Drekmeier
Policy Director
Yosemite Rivers Alliance
(Formerly Tuolumne River Trust)
peter.drekmeier@yosemiterivers.org

YOSEMITE RIVERS ALLIANCE

The Impact of the Design Drought on Water Rates

Question: What if the SFPUC used the same drought plan as Valley Water and East Bay Municipal Utilities District – a repeat of the drought of record, 1987-92?

Answer: The SFPUC could manage this drought, with the Bay Delta Plan flow requirement in place, using the 2050 UWMP RWS demand projections, by requiring 10% rationing in Years 3 and 4 and 20% rationing in years 5 to 6.5, without developing any new expensive alternative water supplies. This would save ratepayers vast amounts of money.

The table on the following page was provided by Matt Moses, SFPUC Water Resources Engineer, on February 16, 2017. Here are a few things of note:

- Modelling assumes 223 mgd RWS demand. The SFPUC's draft 2025 UWMP projects 2050 RWS will be 222 mgd. Note: The SFPUC has acknowledged that UWMP demand projections are the outside bound: "…the [UWMP] projections represent an outside bound of whatever demand will occur in the next 25 years...These demands will likely always be greater than actual demands because not all developments materialize, or they materialize slower than projected."[1]
- The top section of the table does not include the Bay Delta Plan's 40% unimpaired flow requirement. The bottom section does.
- The third row in the top section shows "Tuolumne River Water Available to SFPUC." This number is reduced by "Estimated Contribution to 40% Unimpaired Flow" in the bottom section.
- The table assumes no rationing throughout the Design Drought.

The cumulative "Tuolumne River Water Available to SFPUC" for the first six years of the Design Drought (86-87 to 91-92) is 935,800 AF. That's an average of 155,967 AF/year (this does not include an additional five-month recovery period – July-November 1992).

The cumulative "Tuolumne River Water Available to the SFPUC" for the final two years of the Design Drought (92-76 and 76-77 – not including the five-month recovery period) is 16,231 AF. Divided by two, that's 8,116 AF per year).

The total "Tuolumne River Water Available to the SFPUC" for the 8-year Design Drought (not including the five month recovery period) is 952,031 AF. Divided by eight, that's 119,004 AF/year.

[1] *Water Enterprise and Finance Bureau Water Demand Projections*, SFPUC, July 5, 2022.

The difference between the 6-year drought and the 8-year drought is 36,963 AF/year (33 mgd) of “Tuolumne River Water Available to the SFPUC.” Making up this difference by investing in very expensive alternative water supplies (about $6 billion) would make water rates untenable.

What the SFPUC Data Tells Us

- At the end of the sixth year of the Design Drought (91-92), the SFPUC has a deficit of 15,968 AF in storage (Total System Storage at Start of 92-76).
- The Design Drought also includes an additional five month recovery period (Jul-Nov, 1977). This adds an additional 124,541 AF to the storage deficit (766,640 AF on December 1, 1997 minus 642,099 AF at the end of 76/77). Assuming a similar deficit for a 5-month recovery period following the first six years of the Design Drought, the total deficit for the 6.5-year drought would be 140,509 AF. This assumes no rationing throughout the drought.
- Requiring 10% rationing in years 3 and 4 of the 6.5-year drought would reduce the storage deficit by 50,000 AF. Requiring 20% rationing in years 5 and 6 plus the 5-month recovery period of the 6.5-year drought would reduce the storage deficit by an additional 125,000 AF, for a total of 175,00 AF. This would offset the 140,509 AF deficit mentioned above. We wouldn’t run out of water.

Summary of Design Drought Model Output: Base Case at 223 MGD System Demand											
SFPUC Fiscal Years Included in Design Drought Planning Sequence (July-June)	86-87	87-88	88-89	89-90	90-91	91-92	92-76	76-77	77-78, Jul.-Nov.	Dec. 1, 1977 Storage Low:	Total in Design Drought (July 1986-Nov. 1977)
Total System Storage At Start of Period (AF)	1,613,672	1,230,120	974,478	1,094,992	887,180	923,576	761,330	505,315	242,767	118,627	
Tuolumne River Water Available to SFPUC (AF)	84,893	31,474	394,323	63,982	291,244	69,884	13,721	2,510	0		952,031
Inflow to SFPUC Bay Area Reservoirs (AF)	7,773	7,314	6,144	7,576	21,948	42,932	4,082	3,375	203		101,348
Net Releases for Instream Flows from Bay Area Reservoirs (AF)	3,401	4,193	4,224	3,266	3,390	3,264	4,266	3,358	910		30,271
Spill, Evaporation, and Other Losses (AF)	223,309	40,672	34,250	34,627	32,021	30,515	27,994	23,511	9,188		456,087
Surface Water Delivery to SFPUC Service Area (AF)	249,504	249,562	241,477	241,477	241,383	241,283	241,557	241,563	114,646		2,062,453
Groundwater Delivery to SFPUC Service Area (AF)	0	0	8,100	8,100	8,100	8,100	8,100	8,100	3,819		52,419
Water Supply Rationing (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%		
Post-Processed Effects of SFPUC Contribution to 40% Feb-Jun Unimpaired Flow Standard											
Estimated Contribution to 40% Unimpaired Standard	75,532	104,992	207,602	111,233	169,834	108,117	64,242	43,327	0		884,879
Total System Storage At Start of Year (AF)	1,613,672	1,154,592	793,962	706,876	387,831	254,395	-15,968	-336,223	-642,099	-766,640	
Difference from Base Case (AF)										885,267	

Data provided by Matt Moses, SFPUC Water Resources Engineer, on February 16, 2017.

The Design Drought is 72% more severe than the drought of record. Based on return periods, the Design Drought is 19 times less likely to occur than the drought of record, which Valley Water and EBMUD use for drought planning. Do we really need such a conservative drought plan that could cost billions of dollars to manage?

SNOW SURVEY: Record hot, dry march wipes out California snowpack, leaving no measurable snow for April survey

Warm storms and high-elevation rain accelerate melt months ahead of schedule, impacting water supply for the remainder of the year

Department of Water Resources (DWR) | April 1, 2026

The Department of Water Resources (DWR) today conducted the critical April snow survey at Phillips Station and found no measurable snow, a stark indicator of how record-hot March temperatures and high-elevation rain have erased the Sierra Nevada snowpack months ahead of schedule. The combination of warm storms and unusually hot temperatures rapidly melted what remained of this year's already sparse snowpack. Statewide, the snowpack is now just 18 percent of average for this date, according to the automated snow sensor network.

Today's results are the second lowest April measurement on record for Phillips Station, largely because there was still some visible snow on the ground. By contrast, the lowest April measurement occurred in 2015 when no snow was present at the site. Although DWR and its partners in the California Cooperative Snow Surveys Program are completing additional surveys across the Sierra Nevada, preliminary data indicates this year's April 1 snowpack is the second lowest on record.

The April measurement is a critical marker for water managers across the state, as it is typically when the snowpack reaches its maximum volume and begins to melt. However, this year's extremely hot and dry conditions throughout the month of March, along with a warm atmospheric river system in late February, initiated snowmelt several weeks ahead of schedule. According to automated sensors across the Sierra Nevada, this year's statewide snowpack likely reached its peak on or near February 24.

"It feels like we skipped spring this year and dropped straight into a summer heatwave," said DWR Director Karla Nemeth. "What should be gradual snowmelt happened suddenly weeks ago. To me, this is another reminder that aging water systems need to be retrofit for more volatile precipitation patterns. We're seeing fewer, warmer storms and shorter wet seasons. Future water supplies will depend upon our ability to capture water when it's available and manage it more efficiently."

DWR's water supply forecasts use data from the April 1 snowpack to calculate how much snowmelt runoff will eventually make its way into California's rivers and reservoirs. This information is critical for reservoir managers, who must balance flood control and water supply goals through the winter and depend on snowmelt to slowly refill reservoirs as demand increases during the dry season.

Given the unprecedented heatwave across the West in March, DWR and its partners expanded monitoring efforts to better track this year's rapid snowmelt, including 100 additional mid-month snow surveys across 18 critical watersheds. The California Cooperative Snow Surveys Program has also been working closely with partner agencies to monitor the snowmelt and ensure water managers have the information they need to make informed water management decisions.

DWR has focused efforts over the past five years to understand and track how snowpack accumulation and melt translates into water supply, which has aided efforts to forecast runoff in new extreme climate conditions. New snow hydrology modeling in key watersheds gives DWR better insights into the changing physical state of the snowpack. Expanding data collection efforts with Airborne Snow Observatories Inc. and academic research partners, including UC Berkeley's Central Sierra Snow Lab, now also allow DWR to consider factors like changes in soil moisture and snowpack temperature in its runoff forecasts.

"What makes this year stand out is the disconnect between precipitation and snowpack," said Andy Reising, manager of DWR's Snow Surveys and Water Supply Forecasting Unit. "We received near-average precipitation in many parts of the state, but much of it fell as rain instead of snow. That led to one of the lowest April snowpacks on record and one of the earliest peaks we've seen in decades — conditions that make forecasting runoff more complex."

Although some additional snow is forecasted to arrive in the coming days, it is not likely to make up for the rapid snowmelt and hot, dry March. In the Northern Sierra Nevada, where the state's largest water supply reservoirs are located, the snowpack is just 6 percent of average.

Measuring California's snowpack is a key component of water management. On average, California's snowpack supplies about 30 percent of California's water needs. Its natural ability to store water is why California's snowpack is often referred to as California's "frozen reservoir."

The data and measurements collected from DWR and its partners with the California Cooperative Snow Surveys Program help inform the water supply and snowmelt runoff forecasts, known as the Bulletin 120, that help water managers plan for how much water will eventually reach state reservoirs in the spring and summer. This information is also a key piece in calculating State Water Project allocation updates each month. Learn more about how snow melt makes its way into State Water Project reservoirs each spring.

DWR conducts four or five snow surveys at Phillips Station each winter near the first of each month, January through April and, if necessary, May.

# # #

[Here's what California's dismal snowpack means for the state's future](#)
San Francisco Chronicle | April 1, 2026 | Peter Gleick, Contributor

Conditions for snowboarders at the Northstar at Tahoe Ski Resort are not good. The Truckee resort will close for the season early due to a lack of snow, the result of an early melt. William Hale Irwin/For the S.F. Chronicle

April 1 is the most important day for evaluating California's water resources for the year and is considered the end of the rainy season, which runs from Oct. 1 through March 31. The last day of March is also when final snowpack measurements are made in the Sierra.

The bad news this year is that the snow is already almost gone. On average, California's April 1 snowpack stores around 27 inches of water, equivalent to billions of gallons of water. This year, it is less than 5 inches, and the mountains are largely bare.

What we're seeing is a clear signal of human-caused climate change. California received about its average precipitation this winter; however, only a small fraction was snow. Extraordinarily high temperatures wiped out the snow, either sublimating it off into the atmosphere or turning it into runoff too early in the year to be captured by reservoirs.

From a water-supply perspective, the state is in OK shape: Major reservoirs are full, ensuring that, this year at least, cities and farms will get most of their desired allocations. The longer-term trends, however, are worrying. Ever-rising temperatures will continue to turn snow to rain and melt our snowpacks earlier. Our water supply depends on mountain snow storage to supplement our artificial reservoirs. Without the snowpack, we will draw down our reservoirs earlier, cutting into our reserves and worsening the impact of the inevitable droughts we suffer.

Just look at the crisis on the Colorado River, where, despite having some of the largest reservoirs in the world, reductions in flow due to climate change and continued unsustainable demands have drawn down water supplies to critical levels, forcing difficult and so-far-unresolved political decisions about water allocations and use.

The loss of snow also has other serious repercussions. When snowpacks were healthy and melted slowly, the water kept soils moist and vegetation healthy through the spring and summer. With the loss of snowpack, coupled with rising temperatures, the state's soils and plants are drying out faster, worsening the risks of the devastating wildfires we've experienced increasingly in recent years. The earlier runoff also means that California's rivers and streams are drying up sooner, threatening the health of natural aquatic ecosystems and our fisheries. There are other economic consequences as well, including a serious long-term threat to the multibillion-dollar ski industry.

These impacts were predicted decades ago by climate and water scientists. My own research 40 years ago modeled how climate change would affect water resources in California and showed how rising temperatures would melt mountain snow and change runoff patterns in major rivers. Climate models have long shown similar impacts in mountain regions around the world, along with an intensification of the risk of extreme flooding and drought. Observations around the world, including from the United States, now show these changes are occurring.

It's too late to prevent severe climate change from happening — we've twiddled our thumbs too long, and our politicians have paid too much attention to disinformation from climate deniers and the fossil-fuel companies. But it's not too late to try to build resilience into our water systems to make them more flexible and adaptable to now unavoidable impacts. Far more could be done to reduce wasteful and inefficient agricultural and urban water usage, reducing pressure on limited resources.

Reservoirs can be operated differently to capture earlier snowmelt that is being lost. Greatly expanding the use of high-quality treated wastewater, something done extensively in places like Singapore and Israel, can meet a substantial part of our urban water needs without putting more pressure on overtaxed natural surface and groundwater resources. Far more of our winter runoff can and should be captured in Central Valley groundwater — a cheaper, faster and better alternative than trying to build any more old-style damaging surface reservoirs. And we can accelerate progress in replacing fossil fuels with renewable energy — a policy California has long pursued — reducing greenhouse gas emissions and showing the rest of the world that our needs for energy can be met in cleaner, less climate-destroying ways.

It is long past time to build a more resilient water system for the future that, as this year's paltry snowpack attests, is fast becoming our present.

# # #

Peter Gleick is co-founder and a senior fellow at the Pacific Institute in Oakland and a member of the National Academy of Sciences.

California Water Challenges Take Center Stage as Experts Call for Urgent Action

AgNet News | March 31, 2026

The AgNet News Hour highlighted growing concerns over California's ongoing water challenges, as water management expert Lindsay Cederquist outlined the real-world impact of limited allocations, regulatory pressure, and the need for immediate policy changes.

Cederquist, Director of Water Resources at Diversified Land Management, works directly with growers across the Central Valley to help them navigate increasingly complex water conditions. Her day-to-day role focuses on evaluating farm water portfolios and developing strategies to help operations survive fluctuating water availability.

"We sit down and look at the client's portfolio and see what we can do to help them in each year," Cederquist explained. "Each water year is different… and they all have their unique challenges."

Despite recent increases, allocations on the west side remain critically low. While growers recently saw a bump to 20 percent, Cederquist emphasized that it still falls far short of what's needed to sustain production.

"It's sad that there's not enough," she said. "The challenge is real, and the cost of water is real, and this is what farmers are facing every day."

One of the most pressing concerns raised during the interview is the disconnect between water availability and water management decisions. Even in years with strong reservoir levels, growers are still facing restrictions while water is being released.

"When you have full reservoirs… and a 20 percent allocation, and they're talking about doing flood releases, that is an eye opener," Cederquist said. "There's a lack of storage in California, and that needs to be fixed."

Cederquist also pointed to the implementation of the Sustainable Groundwater Management Act (SGMA) as a major factor shaping the future of farming in California. While groundwater restrictions are intended to create long-term sustainability, they become significantly more difficult to manage when surface water supplies are limited.

"It's when you don't have the water reliability and then they take away your groundwater—that's when you're stuck," she explained.

Beyond policy, Cederquist stressed the resilience and adaptability of farmers, noting that many operations are already implementing innovative solutions like water recharge, deficit irrigation, and improved efficiency practices to stretch limited supplies.

“The farmers… are the ones that are quickly adapting,” she said. “They’re making things happen on the ground every day.”

Still, she made it clear that growers cannot solve the problem alone. Increased water storage, updated regulations, and better coordination between state and federal leadership will be essential moving forward.

Looking ahead, Cederquist emphasized the importance of leadership in shaping California’s water future, especially with a new gubernatorial election on the horizon. “Having a governor that’s pro-ag… is crucial,” she said. “We need representation.”

Despite the challenges, Cederquist remains optimistic that progress is possible. “I truly do have hope that we can… get it back on track,” she said.

# # #

Heated Rivalry: Snowpack Vs. Climate Change. Guess Who Wins

Union of Concerned Scientists | March 30, 2026 | Amanda Fencl

Max Whittaker/Getty Images

Across the western United States, the climate crisis is on full display with record-low snow and an early-season heatwave shrinking critical snowpack that many Western states rely on for their water supplies over summer. Our changing climate, rapidly heating due to the burning of fossil fuels, is shifting the winter water cycle with more precipitation falling as rain than snow and warmer-than-normal temperatures causing premature runoff of what remains of the snowpack.

With climate change, the potential for winters with low- to no-snow is substantial. These profound shifts jeopardize water supply reliability across the West and are forcing us to adapt our water infrastructure to prepare for a future that doesn't look like the past.

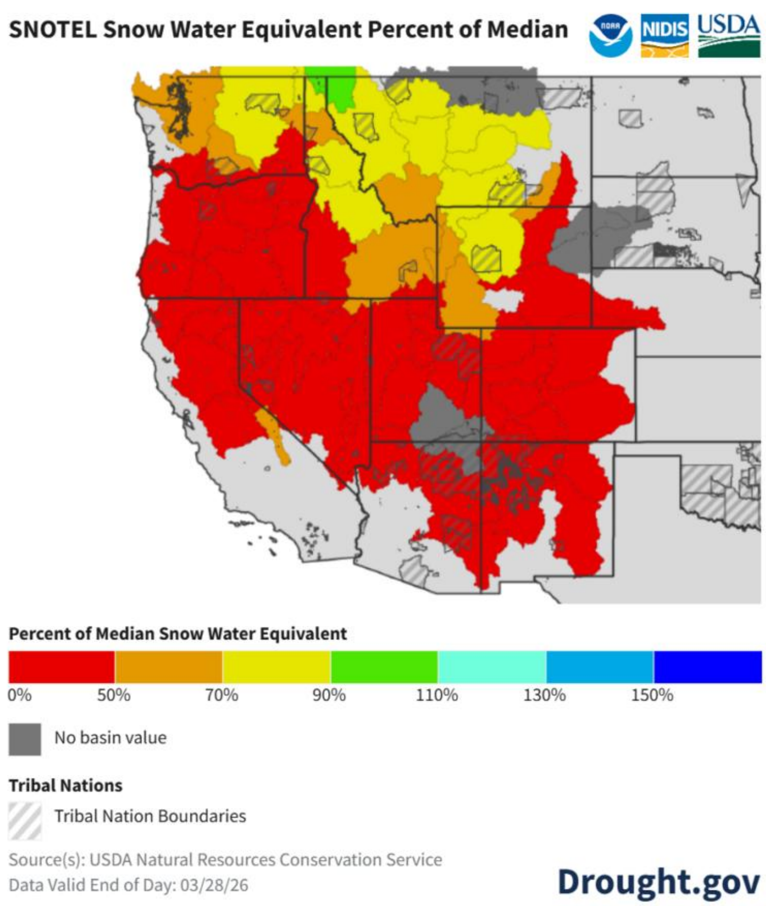
Western states are entering Spring 2026 in a snow drought, with near-record low to record-low snowpack amid unprecedented heat, scarily setting the stage for the possibilities of drought, water shortages and heightened wildfire risk in the coming months.

In California, where I live, the Sierra Nevada snowpack provides nearly a third of the state's annual water supply. Following an unusually warm winter and an extreme March heatwave, water managers will likely find very little snow remaining when they conduct this week's April 1 snow survey—the historic peak of our snowpack. I expect we'll be left with significantly below-average snowpack—consistent with what climate science has been warning us for years will happen with higher global temperatures. What little is left of the snow is disappearing quickly.

What is a snow drought?

While early winter storms brought more than 90 inches of snow to parts of the Sierra over the holiday, that was short lived. The unusually warm winter left many states with serious snow deficits even before the unprecedented, early-season heatwave in March that brought temperatures 20ºF to 40ºF above normal. This abnormally low snowpack is what's called a warm snow drought—meaning that, even with a normal or average amount of precipitation as we've had this year, more rain falls than snow. Recent research shows that the Western US has emerged as a global snow drought "hotspot," with snow droughts more prevalent, intense and longer in the last two decades, compared with 1980-2000.

By early January, one indicator of snowpack—the snow water equivalent (SWE, or amount of water stored in the snowpack) was below the 20th percentile across the western US. This was the lowest recorded level in 25 years (since 2001, when the MODIS satellite record starts). Not much has improved by late March 2026. For example, in Colorado, the SWE across 115 stations was 38% of average, the lowest in more than four decades.



This map shows snow water equivalent (SWE) as a percentage of the 1991–2020 median for western US watersheds based on Snow Telemetry (SNOTEL) station data, valid as of March 28, 2026. Only 5 of the 70 river basins in this map are at or above the 1991-2020 median SWE. The USDA makes an interactive version of this map available. Source: USDA Natural Resources Conservation Service.

In a semi-arid state like California, a robust Sierra Nevada snowpack is essential for sustaining the state through the dry and hot summer season, which is why it's often referred to as the state's "frozen reservoir." Cities, farmers and ecosystems historically rely on predictable mountain snowmelt in late spring, running off into rivers and streams to be stored in network of surface water reservoirs—essential for balancing availability of summer water supply with mitigating spring flood risk. Historically, the largest snow-producing months in Sierra Nevada are December through March. That's why April 1 is typically the peak of snow accumulation. That window is narrowing with climate change.

Unrivaled: Snow is no match for winter heat
An extreme, early-season heatwave like the one experienced across the Western North America in March was "virtually impossible without human-induced climate change" according to a World Weather Attribution study. The record-breaking heat came on the heels of an unusually warm winter across the West, with temperatures breaking records in Arizona, Colorado, New Mexico, Oregon, Utah, and Wyoming. That warmth caused more rain than snow to fall, even at some high elevations, with dire consequences for communities reliant on winter tourism dollars. While a hotter than usual winter gifted us with one form of Heated Rivalry—the type that kept many of us indoors and glue to our TVs—outside, ski resorts across the region ended their seasons early.

In other regions, record breaking winter warming threatens outdoor hockey and skating culture, with groups like Save Pond Hockey rallying around climate change. A recent World Economic Forum report warned that just 10 countries will have the winter weather suitable to host the Winter Olympics by 2040, with billions in anticipated losses to the sports economy.

"Every major river basin in the West experienced its first or second warmest winter (December, January, and February) on record"

Who's the game changer? Climate change
My colleague Dr. Pablo Ortiz previously wrote about the many reasons that snow matters in California, noting that it is an "indicator of climate change" and calling the state's winter snow surveys "a health check-up for our water system."

Since California started its snow survey at Phillips Station in 1942, the lowest measured value was in 2015, when statewide snowpack was 5% of the historic average. That remarkably warm winter, attributed in part to anthropogenic warming, prevented snow accumulation and contributed to the broader context for one of the worst droughts on record.

That's why I am closely tracking the 2026 levels. The year began on a promising note with the California snowpack measuring 89% of average statewide in early January after a series of atmospheric rivers. Following a dry January, which is historically the wettest month of the year in California, that statewide average dropped to 59% of average by late January.

In the Northern Sierra, where several of the state's largest major water supply reservoirs are located, water managers measured the snowpack at a dismal 46% of normal in late February. In the weeks that followed, and before temperatures started shattering records, dry and warm conditions were melting the California snowpack an average of 1% per day, according to data from a network of sensors that weigh overlying snow. The heatwave further accelerated that premature melting, further eroding the snowpack, with estimates that nearly 20% of peak snowpack melted between late Feb and early March.

The rapidly melting snowpack presents a problem in California where winter precipitation filled major reservoirs that are now 122% of average statewide. That means they have limited space to accommodate the additional early runoff from melting mountain snowpack and any additional precipitation from a late-season storms e.g. from this week's expected weather.

Smaller snowpack may mean bigger wildfire risks

The record-high temperatures are drying out vegetation while reduced snowpack and early-season melt in the Western US deprives the soil of prolonged moisture, posing a heightened risk for wildfires. New research warns that declining snowpack and earlier snowmelt may "prime forested watersheds to dry, burn, and experience high severity fire," particularly concerning where snowpack "historically buffered fire risk," and instead may result in more areas burned by severe fires. Earlier snowmelt can also lengthen the fire season by allowing a longer period for vegetation to dry out and become more flammable.

Changes to snowpack and timing of melt are just some of the many ways that climate change is supercharging wildfire activity in the West, driving a near doubling of forest burned area between 1984 and 2015.

Contagious dry spells: Snow to hydrologic droughts

Parts of the Western US have been navigating through the driest two-plus decades in the last 1200 years. The region expects a not-infrequent amount of drought years, but this particular mega-drought is exacerbated by and attributable to anthropogenic warming. Winter snow droughts can progress into a hydrologic drought characterized by observed deficits in water supply (stream flow, reservoir levels, and ground water table declines); or a agricultural or ecological drought where crops and/or ecosystems are impacted by a drought, respectively.

The Colorado River Basin, where snow cover is the lowest level on record, is the water supply for 40 million people. Concerns are growing beyond water supply availability to hydro electricity generation. The Glen Canyon Dam, which sits above Lake Powell and provides electricity to more than 5 million people in six different states, may become inoperable by December 2026 if the minimum water level for power generation is breached, as government projections suggest. In states like Colorado, this winter's snow drought led water users to pursue water-use restrictions earlier than usual: Denver Water asked its residents to help meet a 20% conservation target with other towns declaring water shortage emergencies—a "harbinger of what's to come."

The consequences of the snow drought go beyond hydrologic droughts to water rights as well. The Colorado River basin is already over-allocated (to put it mildly), and this winter's snowpack will likely only exacerbate the ongoing water rights tensions, especially for Tribal Nations with uncertain access and unresolved water rights claims.

A common goal: Drought resilience is a long game

While California managed to be briefly "100% drought free" for the first time in 25 years after an exceptionally wet start to the winter, the National Weather Service's Climate Prediction Center is forecasting that drought will expand to the US West this spring with worsening drought conditions for both the Western US and the South-Central Plains, according to NOAA.

To meet the challenge of a hotter and drier climate, we need to more quickly learn from recent dry periods about how and where our adaptive approaches remain insufficient. For example, after the dry period in 2021-2022, the state had to fundamentally overhaul the way they consider the relationship between snowpack, spring runoff and reservoir storage to better account for how climate driven warming altered runoff regimes. At that time, failure to adequately account for climate change led to overestimating runoff by 68% for the Sacramento River watersheds and by 45%+ for southern watersheds.

Since then, California has made forecasting improvements that could better position the state to adapt to this year's snow drought, but it doesn't change the physical limitations and challenges of balancing summer supply and spring flooding.

Whether it's deciding who gets rights to limited water or what we do with irrigated agricultural land when water runs out, results from this week's snow survey can inform how California rethinks how it manages water in the face of climate change.

In our Western States program, we are committed to a just land transition in California which may facilitate long-term drought and climate resilience. Just land transition solutions are informed by, and responsive to, the realities of our changing climate.

What can we do?
Until your community is "officially" in a drought and you're asked to pay close attention to your household water use—like folks are in Denver—at minimum, all of us can work to hold our elected officials accountable for 1) protecting and preserving the critical climate services provided by U.S. government from institutions like the National Center for Atmospheric Research and 2) protecting democracy. As outlined by my colleague Dr. Jennifer Jones in her recent blog post, "A shared commitment to knowledge and facts, produced independently from political interference, is critical to maintain democratic decisionmaking, sustain public trust in institutions, and enable society to make progress on the world's biggest challenges, including climate change and public health." Democracy depends on science, and and UCS has outlined five ways that scientists can stand up to authoritarianism.

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A clearer view: The first seamless elevation map of the Bay-Delta

Maven | April 1, 2026

At the March Delta Stewardship Council meeting, the Delta Lead Scientist's Report showcased a complete, high-quality elevation map of the entire Bay-Delta estuary—from the Golden Gate to the upper estuary. This marks the first time such a seamless dataset has been created, addressing long-standing challenges in regional mapping.

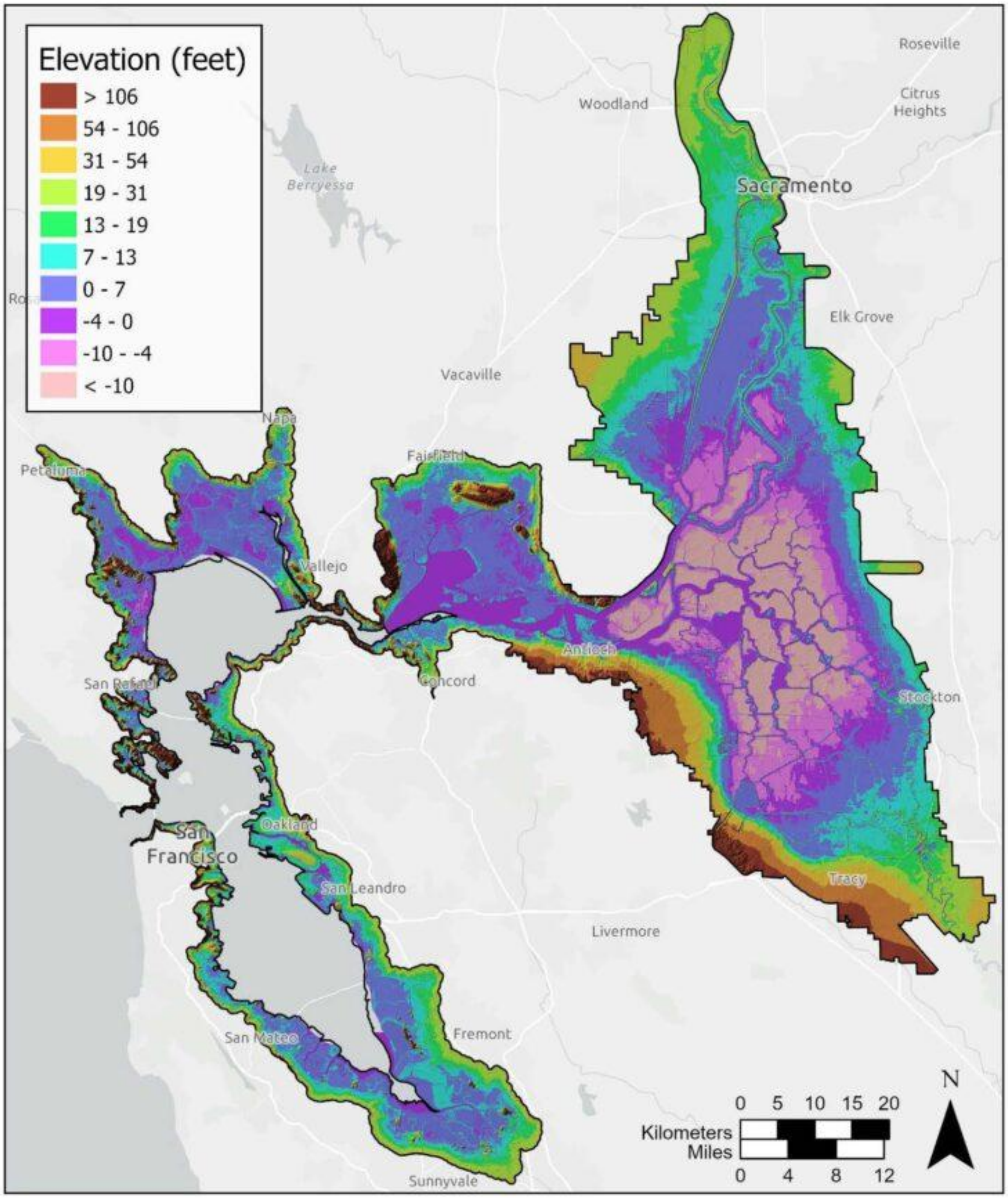
The Bay-Delta is a dynamic landscape, constantly reshaped by natural forces and human interventions. Recent events, such as levee breaches during 2023 storms on the Cosumnes River and intentional restoration projects like Lookout Slough, along with rising sea levels and flooding, such as the Highway 101 inundation in Marin County, further underscore the importance of precise mapping for flood risk assessment, restoration planning, and infrastructure protection.

Accurate, consistent elevation data enables better decisions. However, Bay-Delta mapping was previously patchy—collected for varying purposes, with different equipment and standards, across separate areas and years. As a result, agencies stitched datasets and filled gaps with estimates, adding uncertainty to flood protection, habitat restoration, and water management.

"It was like a quilt made from different scraps," said Megan Nguyen, Science Program Analyst for the Delta Stewardship Council . "It covered the bed, but you couldn't see the full picture. If you only cared about one site, it was fine. But to understand the whole system—how water moves between the bay and the Delta, where flood risk concentrates, and how restoration decisions ripple across the estuary—we need one consistent, high-quality map, not a patchwork. Everyone was collecting pieces, but nobody had the whole picture."

To address this, a collaborative effort led by the San Francisco Bay Wetlands Regional Monitoring Program brought together the Delta Stewardship Council, the San Francisco Estuary Institute, and the Department of Water Resources, with support from the South Bay Salt Pond Restoration Project and Santa Clara County Water District. The result is a comprehensive LiDAR survey that provides an unprecedented, unified view of the Bay-Delta's elevation, offering critical insights for scientists, engineers, and planners alike.

The new seamless map offers greater visibility of ground features and improved vertical accuracy, crucial for areas where slight elevation changes affect water flow. Since the data was gathered during the summer when water levels and tides were at their lowest, the updated dataset provides more comprehensive details of river channels and wetlands than prior maps.



Preliminary Delta surface elevation map derived from the collaborative summer 2025 lidar collection. Note the data are preliminary and still undergoing quality checks.

"It's one map built together for the entire estuary. So for the first time, everyone in the Bay—Delta flood engineers, habitat scientists, infrastructure planners, the public, and more—will be looking at the same map. The map shows the landscape as it actually exists today," said Ms. Nguyen.

Drilling down into the data
The Delta is a landscape of constant change. LiDAR data allows scientists to move beyond a regional view and examine how elevation shifts over time at specific locations. It can capture ground motion, subsidence, and the effects of restoration or development. The dataset also includes features such as vegetation and structures, providing a detailed, three-dimensional snapshot of the landscape. With that level of detail, the data can be used to closely examine how individual sites have changed on the ground.

The slide shows the change in the Dutch Slough elevations from the 2017 LiDAR and the 2025 LiDAR. Dutch Slough was farmland and became the site of a large restoration project. Construction began in 2018. The 2025 LiDAR image shows the levee breaches and the resulting wetland habitats.

"Things have greatly changed on the ground between the two," said Ms. Nguyen. "We have a tidal drainage system growing with finer resolutions of things like tidal creeks, channels, and vegetation."

Alex Braud from the San Francisco Estuary Institute noted that while substantial effort goes into measuring and forecasting water levels for flood risk, having precise elevation data is equally crucial.

The new LiDAR dataset offers two key benefits. First, it enables the identification of vulnerable low-lying areas, especially where floodwaters might breach or overtop levees. Second, by comparing current data with earlier collections, we can monitor changes in the ground itself over time, such as erosion, land subsidence, or effects from new construction.

This slide illustrates how building a neighborhood affects land elevations. The top images, from 2017, depict the area prior to development; the bottom images show the neighborhood as it appears in 2025. Changes between these two data sets are highlighted: blue indicates areas where elevation has increased, while red marks places where elevation has decreased.

"I've spent my career trying to provide the kind of data analysis that leads to smarter decisions. This is a good example of that data that gives engineers, planners, and decision makers a common, accurate foundation to better prioritize where to adapt, and I'm proud to have contributed to it," said Alex Braud.

Next steps
The data is currently undergoing quality assurance and is anticipated to be released later this summer. It will be accessible through the California Natural Resources Agency's open data portal. Subsequently, the maps are expected to be published on federal platforms such as NOAA's Digital Coast and the USGS National Map, allowing users to conduct regional analyses at various scales.

"Our role facilitating these kinds of foundational layers is how the science program builds out our community so that we're all looking at the same high-quality maps," said Delta Lead Scientist Lisamarie Windham-Myers. "This can help people work across the landscape on issues that we all care about, like predicting water movement and mixing, prioritizing sites for ecosystem restoration, modeling flood risk, and ultimately tracking rates and directions of change.”

New Delta mapping tool now online

Also making a debut at the meeting was the Delta Atlas, a tool designed by Council staff to enhance visualization and planning efforts within the Delta region. This free, online interactive mapping tool is intended for use by Council staff, project proponents, and the general public.

With its user-friendly interface, the Delta Atlas provides access to a wealth of unique information, including Delta Plan policy layers and contextual data such as public lands. Users can explore its features to display data, search for specific locations, add place marks and sketches, and even export customized maps. Importantly, the Delta Atlas requires no specialized software or technical expertise, making it accessible to a wide range of users.

The Delta Atlas consolidates key spatial data for the Delta into a single convenient platform, providing a valuable resource for answering common questions, such as whether a location falls within the Delta’s boundaries. Beyond this, it provides administrative boundary layers, including cities, Legacy Communities, and the primary Delta, as well as layers that visualize Delta Plan policies, such as priority habitat restoration zones. These features make it easier to associate policies with specific locations, a task that was previously challenging. The tool also includes accessibility features such as screen reader navigation, keyboard shortcuts, and basic multilingual support.

# # #

[Bay Area weather radar network aims to improve storm forecasting, flood prep and drought planning]
ABC 7 | March 28, 2026 | Gloria Rodríguez

SAN FRANCISCO (KGO) -- Local, state and federal agencies gathered in San Francisco Thursday to announce a new radar network designed to show where the heaviest rain will fall in the Bay Area.

The San Francisco Public Utilities Commission worked with a coalition of Bay Area water, wastewater and flood control agencies on the project.

The network can help with evacuation plans or water resource planning in our drought-prone state.

Martin Ralph, Ph.D., of UCSD Scripps Institution of Oceanography, said the existing traditional radar network doesn't cut it.

"This is going to help fill that gap in minutes to hours lead time that's vital to know where the heaviest rain is going to hit," Ralph said. "And when and what communities are going to be affected so people in the preparedness community and water resource management community can take action to help protect people's lives and property."

It's called the San Francisco Bay Area AQPI Network, which stands for "Advanced Quantitative Precipitation Information." The data provides rainfall updates every 1 to 2 minutes. There are installations, including in Sawyer Ridge in the Peninsula.

Sonoma County Supervisor David Rabbitt, District 2, who is also a Board of Director for Sonoma Water, said this will be especially valuable along the Russian River, which is prone to flooding.

"Having better data to prepare and to pass that information on to residents to start evacuations, if needed, earlier so they're safer," Rabbitt said.

Steve Thur, Ph.D., of the National Oceanic and Atmospheric Administration, said one of the unique features of the West Coast is how important just a few atmospheric systems are each year for the water supply here.

"So when we think about water storage and flood control, understanding hyper-local precipitation information is certainly terribly important," Thur said.

Thur said this new Bay Area system could help shape the next generation of radar technology for the entire country.

The funding for the network came from a nearly $20 million grant from the California Department of Water Resources and was an eight-year effort.

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