Draft White Paper Discussion On:

Proposed Updates for the 2024 Drinking Water Needs Assessment

December 13, 2023

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Executive Summary

The State Water Board is proposing to make the following adjustments for the 2024 Drinking Water Needs Assessment:

(1) Expand the existing Failing criteria to include new Source Capacity and Water Outage related violations. Approximately 18 public water systems would be added to the Failing list with the addition of this new criteria.
(2) Add and remove violation codes to existing Failing criteria to improve the identification of systems failing within the current criteria categories.
(3) Update the Cost Assessment Model to better assess long-term and interim needs for Failing and At-Risk public water systems, state small water systems, and domestic wells.

Introduction

In 2016, the State Water Board adopted a Human Right to Water Resolution making the Human Right to Water (HR2W), as defined in Assembly Bill 685, a primary consideration and priority across all of the state and regional boards' programs.[1] The HR2W recognizes that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes."

In 2019, to advance the goals of the HR2W, California passed Senate Bill 200 (SB 200) which enabled the State Water Board to establish the Safe and Affordable Funding for Equity and Resilience (SAFER) Program. SB 200 established a set of tools, funding sources, and regulatory authorities the State Water Board can harness through the SAFER Program to help struggling water systems sustainably and affordably provide safe drinking water to their customers. Among the tools created under SB 200 is the Safe and Affordable Drinking Water Fund (Fund). The Fund provides up to $130 million per year through 2030 to enable the State Water Board to develop and implement sustainable solutions for underperforming drinking water systems.

The SAFER Program harnesses the Fund together with other State Water Board funding programs to advance the implementation of interim and long-term solutions for communities across the state. The State Water Board prioritizes SAFER Program funding annually through the Fund Expenditure Plan (FEP). The annual FEP is to be informed by "data and analysis drawn from the drinking water **Needs Assessment**," per California Health and Safety Code section 116769.

The State Water Board's Drinking Water Needs Assessment (Needs Assessment)[2] consists of four core components: the Failing Water System List (Failing list), Risk Assessment, Cost Assessment, and Affordability Assessment.

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[1] State Water Board Resolution No. 2016-0010
https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2016/rs2016_0010.pdf
[2] Drinking Water Needs Assessment
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/needs.html

Failing Water System List: Since 2017, the State Water Board has assessed water systems that fail to meet the goals of the HR2W and maintains a list and map of these systems on its website.[3] Systems that are on the Failing list are those that are out of compliance or consistently out of compliance with drinking water regulations.

Risk Assessment: SB 200 calls for the identification of "public water systems, community water systems, and state small water systems that may be at risk of failing to provide an adequate supply of safe drinking water." As well as "an estimate of the number of households that are served by domestic wells or state small water systems in high-risk areas."[4] Therefore, different Risk Assessment methodologies have been developed for different system types: public water systems, state small water systems, and domestic wells.

Cost Assessment: SB 200 directs the State Water Board to "estimate the funding needed for the next fiscal year based on the amount available in the fund, anticipated funding needs, other existing funding sources."[5] Thus, the Cost Assessment estimates the costs related to the implementation of interim and/or emergency measures and longer-term solutions for Failing and At-Risk systems.

Affordability Assessment: SB 200 calls for the identification of "any community water system that serves a disadvantaged community that must charge fees that exceed the affordability threshold established by the board in order to supply, treat, and distribute potable water that complies with federal and state drinking water standards."[6] The Affordability Assessment evaluates several different affordability indicators to identify communities that may be experiencing affordability challenges.

Expanding the Failing Criteria

On September 25, 2012, Governor Edmund G. Brown Jr. signed Assembly Bill (AB) 685, making California the first state in the nation to legislatively recognize the human right to water (HR2W). Now in the Water Code as Section 106.3, the state statutorily recognizes that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." The HR2W extends to all Californians, including disadvantaged individuals and groups and communities in rural and urban areas.

On February 16, 2016, the State Water Board adopted a resolution identifying the human right to water as a top priority and core value of the State Water Board and Regional Water Quality Control Boards (collectively the Water Boards). The resolution

[3] SAFER Dashboard https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/saferdashboard.html
[4] California Health and Safety Code section 116769.
[5] California Health and Safety Code section 116769.
[6] California Health and Safety Code section 116769(2)(B).

stated the Water Boards will work “to preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.”

The State Water Board assesses water systems that fail to meet the goals of the HR2W and maintains a list and map of these systems on its website. The Failing list is updated and refreshed daily as violations and enforcement actions are issued or updated. Systems that are on the Failing list are those that are out of compliance or consistently fail to meet primary drinking water standards.

The Failing list criteria were expanded in April 2021 to better align with statutory definitions of what it means for a water system to “consistently fail” to meet primary drinking water standards. The State Water Board is proposing to expand these criteria to better capture water systems that are unable to consistently provide safe drinking water to their customers. The proposed new expanded Failing criteria includes source capacity violations and water outage violations.

Table 1 summarizes the new recommended expanded criteria.

Table 1: Failing Criteria 2017 - Proposed

Criteria	Jan. 2017 – Apr. 2021	Apr. 2021 – Apr. 2024	After Apr. 2024
Primary MCL Violation with an open Enforcement Action	Yes	Yes	Yes
Secondary MCL Violation with an open Enforcement Action	Yes	Yes	Yes
***E. coli* Violation with an open Enforcement Action**	No	Yes	Yes
Treatment Technique Violations • One or more Treatment Technique violations with an open Enforcement Action. • Three or more Treatment Technique violations within the last three years regardless of Enforcement Action status.	Partially	Expanded	Yes
Monitoring and Reporting Violations • Three Monitoring and Reporting violations within the last three years where at lease one violation has been open for 15 months or greater.	No	Yes	Yes
Source Capacity & Water Outage Violations with an open Enforcement Action	No	No	Yes

Proposed Changes to Existing Criteria

The State Water Board proposes to make the following changes to the existing Failing criteria:

Table 2: Proposed Modifications to the Violations Included in the Failing Criteria

Failing Criteria	Violation Number	Remove or Add?	Details
Primary MCL Violation	MP	Add	MCL violation for a water system using POU/POE. This is a failure to properly implement POU/POE and is considered a violation of a variance/exemption granted by the State.
***E. coli* Violation**	01[7]	Remove	MCL violation based on a single sample, or an organic analyte that is 10X the MCL.
***E. coli* Violation**	02[8]	Remove	A violation for an inorganic, organic, or radiological constituent where compliance is based on a running annual average or more monitoring period average.
***E. coli* Violation**	T1[9]	Remove	A violation where the water system failed to treat water using the treatment process the State has primacy to regulate (i.e., treatment failed per the system's permit).
Treatment Technique Violation	11	Add	A violation of the maximum disinfectant residual level (MRDL) for chlorine, chloramine, or chlorine dioxide.
Treatment Technique Violation	13	Add	A violation where the public water system has a daily sample taken at the entrance to the distribution system which exceeds the maximum disinfectant residual level (MRDL) for chlorine dioxide and on the following day, one or more, of the three samples taken in the distribution system exceed the MRDL.

[7, 8, 9] These violations have historically been inadvertently used to record an *E. coli* violation. The State Water Board recommends removing these to better align with agency guidelines for issuing *E. coli* violations. Violation Number 1A is the code that is used to record *E. coli* violations.

Failing Criteria	Violation Number	Remove or Add?	Details
Treatment Technique Violation	40	Add	For public water systems with conventional or direct filtration that recycle flows only, failure to return filter backwash through all treatment elements.
Treatment Technique Violation	46	Add	For public water systems with conventional filtration only, failure to meet the disinfection byproduct precursor removal ratio.
Treatment Technique Violation	2E Analyte #: 5200-LCRR	Add	A system fails to complete the initial lead service line inventory[10] by October 16, 2024. CFR §141.80(f)(3) & CFR§141.80(a).
Monitoring & Reporting Violation	4G Analyte #: 5200-LCRR	Add	A system that fails to submit an initial inventory of service lines to the State no later than October 16, 2024. CFR§141.80(e)(1).
Monitoring & Reporting Violation	66[11]	Remove	Failure to provide a lead consumer notice.
Monitoring & Reporting Violation	19	Add	Failure to complete source water assessment monitoring.
Monitoring & Reporting Violation	29	Add	For a public water system using surface water only, failure to conduct a comprehensive performance evaluation and/or produce a filter assessment due to an individual filter turbidity exceedance.
Monitoring & Reporting Violation	32	Add	For a public water system using surface water only, failure to submit a complete source water monitoring plan and/or failure to complete monitoring from said plan.
Monitoring & Reporting Violation	53	Add	Failed to collect and report routine or follow-up water quality parameter samples.

[10] Absence of a service line inventory presents unknown service lines that could be of concern. The only way to address this issue is by completing the service line inventory, which is a “Treatment Technique.”
[11] Currently, other violations related to notifying customers are excluded from the Failing criteria.

Failing Criteria	Violation Number	Remove or Add?	Details
Monitoring & Reporting Violation	SP	Add	POU/POE monitoring and reporting failure. This is a failure to properly implement POU/POE and is considered a violation of a variance/exemption granted by the State.
Monitoring & Reporting Violation	RR Analyte #: C296	Add	Water system fails to report drought information pursuant to drought order.

Adding New Source Capacity and Water Outage Violations

California Waterworks Standards require public water systems to always have the capacity to meet the system's maximum day demand and peak hourly demand both in the system as a whole and in each individual pressure zone as determined pursuant to California Code of Regulations Title 22 Division 4 Chapter 16.[12] The State Water Board developed new source capacity violation codes in 2021 to better track and identify water systems failing to meet source capacity standards. Historically, the State Water Board has responded to source capacity violations with targeted citations, curtailment orders, and service connection moratoriums.

New source capacity and water outage violations include:

- Failure to maintain adequate source capacity (may include curtailment order and/or service connection moratorium).
- Failure to maintain adequate pressure leading to a water outage.
- Failure to complete a required source capacity planning study.

Failing Criteria

- At least one Source Capacity Violation with an Open Enforcement Action

Methodology

- **Step 1**: Determine which systems have incurred a Source Capacity Violation in the SDWIS database.
    - Query systems that only have Source Capacity Violations listed in the table below.

Table 3: Source Capacity and Water Shortage Violations

[12] California Code of Regulations Title 22 Division 4 Chapter 16
https://bit.ly/40oNDjE

SDWIS Analyte Data Field Code	Violation Type Code	Description
C277	WW	Water system fails to have adequate source capacity.
C278	WW	Water system fails to have adequate source capacity due to curtailments.
C279	WW	Water system fails to have adequate pressure, leading to outage caused by drought.
C295	WW	Water system fails to have adequate pressure, leading to outage not related to drought.

- **Step 2**: Determine which systems have an Enforcement Action associated with those Violations.

- **Step 3**: Determine which systems do not have a SOX (State Compliance Achieved) Enforcement Action associated with the Enforcement Action. A SOX Enforcement Action indicates when the system has returned to compliance or met the obligations of the Enforcement action.
    - These systems meet the Failing criteria and are added to the Failing list.

- **Step 4**: A system will no longer meet the Source Capacity Violation Failing Criteria once a SOX Enforcement Action associated with the open Source Capacity Violation has been entered into SDWIS.

Preliminary Estimate of New Failing Systems

The proposed changes to the Failing criteria, if implemented currently, would add 19 public water systems to the Failing list and 1 would be removed. Of the 19 systems added to the list, 18 are meeting the new Source Capacity and Water Outage category Failing criteria and 1 is meeting the newly expanded Treatment Technique violation Failing criteria.

Update the Cost Assessment Model

The Cost Assessment is a model comprised of decision criteria, cost assumptions, and calculation methodologies used to estimate a statewide cost for implementing long-term

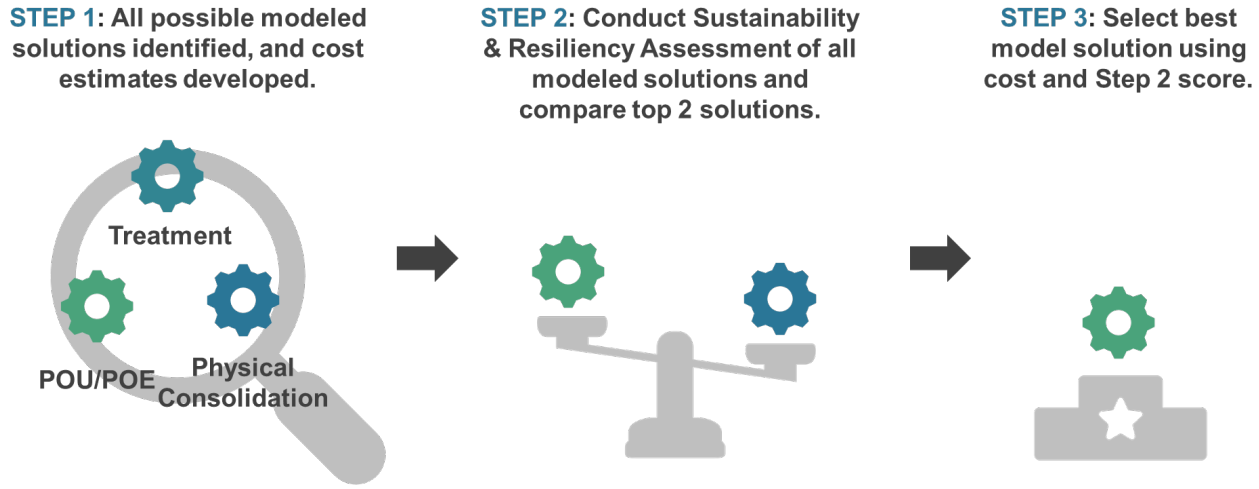
and interim solutions for Failing public water systems,[13] At-Risk public water systems, At-Risk state small water systems and domestic wells.[14]

The original 2021 Cost Assessment Model methodology was developed in partnership between the State Water Board, University of California, Los Angeles (UCLA) Luskin Center for Innovation, Corona Environmental Consulting (Corona), and Sacramento State University Office of Water Programs.[15] The original Model was developed through extensive stakeholder engagement through public workshops and published white papers from 2019 through 2021. All materials related to the 2021 Cost Assessment Model are available on the State Water Board's website.[16]

The original 2021 Model employed a three-step approach for identifying the best long-term modeled treatment solution for Failing water systems with water quality violations (Figure 1). In Step 1, the Model would assess Failing water systems; select treatment technologies based on the system's failing analyte(s); estimate capital and operational costs for centralized treatment, decentralized treatment, and physical consolidation; and then compare the different potential solutions across several criteria in Step 2 (Sustainability & Resiliency Assessment) of the Model before selecting the final modeled solution in Step 3.

[13] Failing Water Systems Criteria:
https://www.waterboards.ca.gov/water_issues/programs/hr2w/docs/hr2w_expanded_criteria.pdf
[14] 2023 Risk Assessment Results for public water systems, state small water systems and domestic wells:
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2023needsassessment.pdf
[15] 2021 Drinking Water Needs Assessment Report:
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2021_needs_assessment.pdf
[16] State Water Board Drinking Water Needs Assessment
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/needs.html

Figure 1: 2021 Cost Assessment Model Long-Term Solution Selection Process for Failing Water Systems



For Failing water systems, the 2021 Cost Assessment selected decentralized treatment (POU/POE) for 35%; centralized treatment for 45%; and physical consolidation for 20%. At the time of publication, the State Water Board recognized inherent limitations in the original Model that led to the over-selection of decentralized treatment and under-selection of physical consolidation as the modeled long-term solution. These limitations were attributed to the lack of data availability; the exclusion of modeled regional consolidation projects that would have driven down the modeled cost estimate of physical consolidation; and the inability of the Model's design to account for the inherent risk and long-term maintenance challenges posed by decentralized treatment. Therefore, the 2021 Cost Assessment's results did not fully reflect the State Water Board SAFER program's core mission and direction to promote physical consolidations where feasible and only advance decentralized treatment where no other long-term options may be viable.

Based on stakeholder feedback and internal deliberations, the State Water Board began rebuilding the Cost Assessment Model in 2022. The proposed updated Model takes a more streamlined approach to identifying **long-term solutions** for Failing public water systems with water-quality related violations (Figure 2).[17] The Model first assesses the viability for physical consolidation for all Failing systems. If physical consolidation is not

[17] Failing water systems that are failing due to monitoring and reporting violations will not be assessed for long-term or short-term modeled treatment. Depending on the Failing system's economic status and size, the system may be assessed for an Administrator, technical assistance, and other essential infrastructure. These cost estimate assumptions will be explored in the next workshop and white paper.
At-Risk public water systems are excluded from the long-term and short-term modeled treatment analysis, steps 2 and 3 in Figure 2. Depending on the At-Risk public water system's economic status and size, the system may be assessed for an Administrator, technical assistance, and other essential infrastructure. State small water systems and domestic wells at high-risk in the Risk Assessment's *Water Quality* category are assessed for decentralized long-term solutions only in the treatment analysis.

viable, then alternative centralized and decentralized treatment solutions are explored by the Model. The State Water Board has recommended the removal of the "Sustainability & Resiliency Assessment" (STEP 2 in Figure 1) comparing estimated physical consolidation capital costs to centralized and decentralized treatment.

Figure 2: Proposed Updated Cost Assessment Model Long-Term Solution Selection Process for Failing Public Water Systems

The State Water Board is seeking public input on the proposed updates to the Cost Assessment Model through a series of webinar workshops and associated white papers. The State Water Board has released four white papers and hosted four public workshops to seek stakeholder feedback on the Cost Assessment Model re-build:

(1) August 2022: *Proposed Changed for the Cost Assessment*.[18]
(2) July 2023: *Proposed Updates to the Drinking Water Cost Assessment Model – Physical Consolidation Analysis*.[19]
(3) October 2023: *Proposed Changes for Modeled Long-Term Treatment*[20]
(4) December 2023: *Proposed Updates to the Drinking Water Cost Assessment Model* – Other Essential Infrastructure, Admin Needs, and Interim Solutions

The updated Cost Assessment Model's results will be released with the 2024 Drinking Water Needs Assessment. Below is a brief summary of the proposed changes for the Cost Assessment Model:

[18] Proposed Changes for the Cost Assessment White Paper: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/cost-assessment-white-paper.pdf
[19] Workshop 1, July 14, 2023: Proposed Updates to the Drinking Water Cost Assessment Model – Physical Consolidation Analysis White Paper: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2023/20230714-final-cost-assessment-consolidation-white-paper.pdf
[20] Workshop 2, October 5, 2023: Proposed Updates to the Drinking Water Cost Assessment Model – Proposed Changes for Modeled Long-Term Treatment White Paper https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2023/modeled-treatment-draft-whitepaper.pdf

Physical Consolidation:

- Determine if physical consolidation is a viable model solution initially before modeling other potential solutions.
- Update the criteria used to identify which water systems are included in the physical consolidation analysis. A core recommendation is to include large/medium Failing systems as possible Receiving systems in the analysis.
- Update the distance criteria used in the analysis to identify where potential physical consolidations may be viable for state small water systems and domestic wells.
- Update physical consolidation unit cost assumptions using internal and external quotes and resources.
- Apply inflation and other cost adjustments to the subtotal construction cost estimates.
- Increase physical consolidation cost viability thresholds based on the most recent State Water Board Intended Use Plan (IUP) and include a 20% buffer to accommodate uncertainty in the Model.
- Utilize new funding viability thresholds for state small water systems and domestic wells.
- Calculate additional costs for physical consolidation projects that meet the viability thresholds and then add to the summed total:
    - Treatment cost for model-selected Failing Receiving water systems.
    - Additional source costs for the Receiving system if it has a single source.
    - Additional "Other Essential Infrastructure" (OEI), Administrator, Technical Assistance (TA), and other additional costs as determined by the Model.

Long-term Treatment Capital and Operations and Maintenance (O&M) Costs:

- Utilizing additional information about each Failing water system to better identify which systems to include in the treatment analysis and better match potential modeled treatment to the Failing system's violations. For example, systems that are Failing for multiple monitoring and reporting violations will ***not*** have treatment modeled as a potential solution.
- Removing the sustainability and resiliency assessment to accommodate the new approach for matching potential model solutions to each system based on their challenges identified by Failing criteria or the Risk Assessment for state small water systems and domestic wells.
- Lowering the modeled decentralized treatment threshold for Failing public water systems from 200 to 20 service connections for most, but not all contaminants. This means more water systems will be assessed for centralized treatment over decentralized treatment.
- Enhancing underlying capital and O&M cost estimate assumptions to reflect current market prices utilizing updated U.S. Environmental Protection Agency (U.S. EPA) treatment models, vendor-provided quotes, data from State Water Board funded projects, and staff recommendations.

Other Essential Infrastructure, Admin Needs, and Interim Solutions:

- Adding a cost estimate for a new private well for high-risk (*Water Shortage* Risk Assessment category) state small water systems and domestic wells where modeled physical consolidation is not viable.
- Enhancing the identification of other essential infrastructure (OEI) needed by Failing and At-Risk public water systems. The original Model assumed a statewide percentage of needs based on a Kern County case study. The proposed updated Cost Assessment Model will utilize available system data to identify OEI needs.
- Enhancing underlying OEI capital cost estimate assumptions to reflect current market prices utilizing vendor-provided quotes, data from State Water Board funded projects, and staff recommendations.
- Updating eligibility criteria, cost and duration assumptions for technical assistance and Administrator assistance needs.
- Updating eligibility criteria, cost and duration assumptions for interim assistance (decentralized treatment and bottled water) for Failing public water systems and high-risk state small water systems and domestic wells.

It is important to note that the Cost Assessment is not intended to identify actual solutions that should be implemented for a given system. An evaluation of each system will be needed to identify and cost a range of solutions. As the State Water Board's data improves, the Cost Assessment will improve over time.

Public Feedback & Next Steps

The State Water Board intends to implement these proposed changes for the 2024 Drinking Water Needs Assessment which is planned to be released in Spring 2024. The State Water Board is committed to engaging with the public and stakeholder groups to solicit feedback and recommendations on the proposed updates detailed in this paper. The received feedback will help refine the updated Cost Model over time. Feedback is due on January 13, 2024. Feedback may be submitted directly to DDW-SAFER-NAU@waterboards.ca.gov.