

Affordability and Financial Needs Assessment for California's Proposed MCL for Hexavalent Chromium

Final Report

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Prepared for:

The Community Water System Alliance

California Association of Mutual Water Companies

Prepared by:

Janet Clements

Bob Raucher, PhD

Trygve Madsen



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Foreword

This report was prepared for the Community Water System Alliance (CWSA) and California Association of Mutual Water Companies (CalMutuals).

CWSA represents water systems serving disadvantaged communities that are reliably and affordably providing water to low income and income limited residents. Founded on the concept of larger systems helping smaller ones, CWSA members tackle many issues that impact both small and large – but always keeping an eye on special challenges faced by those with fewer resources. Members include cities and special districts and range from the low desert to the central coast.

CalMutuals provides effective advocacy and facilitates operational and educational resources to ensure effective and compliant operation and governance for small systems. From a small but dedicated group of larger mutual water companies, CalMutuals celebrated its tenth year in 2023 with 500 across the state. The association has also gained a reputation for no-nonsense advocacy on behalf of small systems.

By commissioning the report that follows, CWSA and CalMutuals sought a reality check on the lofty but competing goals of California’s Human Right to Water. That law states (in part):

“It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.

“All relevant state agencies, including the ... state board [State Water Resources Control Board] ... shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria...”

How the State Water Resources Control Board implements that policy has profound implications for the people of California. How safe is “safe enough” when each added increment of safety makes water unaffordable for a significant number of people? Can low-income residents rely on the promise of “safe, clean, affordable, and accessible water?” The high-profile regulation of hexavalent chromium offers a chance to understand how the State Water Board balances the qualities set forth in the Human Right to Water, and assess whether appropriate consideration is given to affordability when setting drinking water standards more stringent than anywhere else in the nation.

We are thankful that the authors have shed some light on these questions. Our organizations hope the results will inform policymakers and stakeholders, and add depth of meaning to California’s Human Right to Water policy. We are also grateful for the review and insights shared by the Project Advisory Committee (affiliations for reference only):

- Janice Beecher, PhD – Michigan State University; Institute for Public Utilities
- Christine Boyle, PhD – Burnt Island Ventures; Chair, California-Nevada Section, AWWA
- Cástulo Estrada – Coachella Water Authority
- Kurt Schwabe, PhD -- University of California, Riverside
- Yan Zhang, PhD – Long Beach Utilities
- Jay Zucca – San Andreas Mutual Water Company

Timothy Worley, PhD
CWSA Managing Director

Susan Allen, EdD
CalMutuals Member Services Director

Executive Summary

In June 2023, the State Water Resources Control Board (SWRCB, or Board) issued an updated draft maximum contaminant level (MCL) for Hexavalent Chromium (Cr VI). The updated MCL incorporates new approaches for evaluating the economic feasibility and affordability of the proposed regulation. In this report, we present and apply a framework that enhances the State’s assessment for characterizing affordability challenges. The goal is to ensure that fiscal support needs of Community Water Systems (CWSs) and economically challenged households are met in a targeted and holistic manner. In addition, we raise key questions and concerns regarding the State’s proposed mechanisms to provide funding to water systems that will struggle to meet the costs of compliance.

A Spotlight on Economic Feasibility and Affordability

California’s proposed MCL for Cr VI is a focal point for how the State addresses “economic feasibility” and “affordability” in accordance with the provisions of its Safe Drinking Water Act (Act) and Human Right to Water (HR2W) legislation. The original Cr VI MCL, initially issued in 2014, was struck down in Superior Court in 2017 based on the Judge’s finding that the State failed to effectively evaluate economic feasibility as required by the Act. A key aspect of the Judge’s ruling was that the State did not consider affordability in its determination of economic feasibility, and instead equated economic feasibility to cost-benefit analysis.

SWRCB subsequently has sought to clearly define and address the challenges associated with economic feasibility and affordability. Adopting the Board’s terminology here, *affordability* reflects “the ability of a household to pay its own bill,” while *economic feasibility* is defined as “the ability of the *general state population* served by public water systems to pay for compliance to a drinking water standard” (SWRCB 2020, emphasis added). While the Board has sought to make a key distinction between *economic feasibility* and *affordability*, the concepts are inextricably linked. In communities in which a large portion of households face compliance-driven water bill increases imposing economic hardship, household-level affordability poses a very real barrier to the economic feasibility of compliance for the CWSs serving them.

SWRCB has stated its intention to provide sufficient financial support to ensure that public health protection standards for essential water and sanitary services can be met in a fair and reasonable manner (SWRCB, 2023a). State-promised fiscal assistance is a welcome step forward. However, economic feasibility for the proposed MCL requires that the State’s monetary support be sufficient in scale, available on a sustained long-term basis, well targeted to communities and households in need, and relatively easy for small CWSs to access.

Affordability Challenges for Drinking Water Regulations

Challenges associated with the affordability and economic feasibility of drinking water regulations stem from “economies of scale” that dominate water purification technologies (resulting in relatively high costs per unit of water in smaller systems), combined with the fact that a large proportion of CWSs serving the public have a relatively small number of households sharing the expense. Consequently, regulatory compliance costs typically are far greater on a per household basis in small CWSs than in communities served by larger water systems.

Compliance cost estimates for the Cr VI MCL reflect this reality. The Board estimates compliance for the proposed Cr VI MCL will add:

- \$96 per year, on average, to water bills for the 1.2 million households served by the 31 largest water systems (e.g., greater than 10,000 service connections) that would be impacted by the Cr VI MCL (i.e., systems with a contamination level of greater than 10 ug/L).
- \$1,620 annually, on average, to the water bills for the 2,600 households residing in 62 impacted CWSs with less than 100 service connections (an expense nearly 17 times greater than for large system customers).

Because a considerable majority of the state’s MCL-impacted households are served by relatively large water systems -- and thus will face relatively modest water bill increases -- the Board notes that the proposed MCL is *affordable* for the “general state population.” Further, the Board determined the proposed Cr VI regulation to be *economically feasible* “because there are sufficient resources available to potentially mitigate the challenge of compliance for the systems that are already struggling” (SWRCB ISOR 2023a).

Providing Targeted Financial Support

Recognizing that many households will face affordability challenges because of the regulation, the State’s proposed rule includes a commitment of considerable financial support for those CWSs that meet a suite of affordability-related criteria developed by the Board (SWRCB, 2023: ISOR pp. 42 – 43):

- Having a baseline (pre-MCL) medium or high affordability burden, as determined by the State Water Board’s *Drinking Water Needs Assessment* (SWRCB, 2022a). The Needs Assessment includes four metrics and associated thresholds for determining affordability burden. Water systems exceeding two of the thresholds are designated as having a medium affordability burden; those exceeding three or four of the thresholds have a high burden.
- Systems on the Water Board’s “Human Right to Water” (HR2W) list
- Systems needing to recover more than \$30 per month per service connection to comply with the MCL.

Applying these funding criteria to its CWS-level compliance cost estimates, the Board estimates that a total grant allocation of \$73 million per year, directed to the targeted CWSs, will sufficiently address affordability challenges for households served by those systems. The Board further maintains that this level of funding is well within the State’s fiscal means, amounting to less than 9% of an existing pool of \$823 million that the Board states is currently available from a suite of water funding programs. The State identifies “available state grants,” as well as DWSRF principal forgiveness and SADW funding for FY 2022-2023 as the sources of funding available to support of affordable compliance with the proposed MCL.

Questions Regarding the State’s Affordability Analysis and Findings

The State’s proposed approach is commendable in that it recognizes the need to offer considerable financial support to CWSs for which Cr VI MCL compliance is projected to impose significant economic hardship. Nonetheless, aspects of the Board’s approach, and related practical implications for sustaining the promised level of fiscal support and effectively administering the process, raise several questions and concerns, outlined below.

Magnitude of the Funding Support Required: Is the State’s estimate of the level of fiscal support needed sufficient? Further, does the State have the fiscal wherewithal and readily accessible pathways for

efficiently channeling sufficient monetary support to the CWSs, communities, and households facing affordability challenges?

The State claims it can fully address the affordability challenge with \$73 million per year, which amounts to 9% of the \$823 million it claims is available for such purposes. Our analysis indicates that the \$73 million per year may well be an underestimate of the financial support needed:

- Based on alternative affordability criteria (and associated thresholds) applied by the project team, several additional CWSs are likely in need of financial assistance to comply with the MCL.
- There are many economically challenged *households* in CWSs that do not meet the State's or project team's eligibility criteria for assistance, and those households will likely face affordability challenges resulting from compliance-driven increases in water costs.

After accounting for the additional systems and households that meet the criteria above, and excluding *systems* that meet the State's eligibility criteria but that serve relatively affluent populations, our analysis indicates a total need of \$110 to \$123 million per year.

As an important note, this assessment (and associated estimate of need) relies on the State's treatment cost estimates for impacted systems. However, there is concern among stakeholders that the State's estimates significantly underestimate the costs of compliance, particularly for small systems. Higher treatment costs would increase both the number of CWSs in need and the amount of fiscal assistance required per system.

Availability and Long-Term Sustainability of Fiscal Support: Can the State ensure long-term continued fiscal support at the levels required to all those with affordability needs?

There also are concerns regarding the true level of overall funding available from which to draw monies for Cr VI compliance support. It is not clear that \$823 million is fully available from the sources the Board specifies. Given prior commitments and the realities of periodic state and federal budget adjustments, it is not evident how much funding for CWS compliance support is realistically available. Further, to effectively address the affordability and economic feasibility challenge, the State funds will need to be distributed through a process that limits the administrative burden on small CWSs and provides funds in a timely and readily accessible manner to ensure prompt compliance.

In addition, public health protection requires sustained long-term efforts and expenditures to ensure compliance is maintained over the decades ahead. It is not evident that the State is fully committed – or will have the fiscal wherewithal – to continue providing the required financial support indefinitely into the future. And, providing the funds in a front-loaded manner – rather than based on annualized costs – will better ensure CWS have access to sufficient capital to acquire and install necessary treatment.

Supporting Competing Needs: Can the State assure that the demand for State funding supporting Cr VI MCL compliance does not unduly divert its spending on infrastructure rehabilitation, other water quality regulations and programs, and other necessary investments that may provide greater health protection and other benefits to ratepayers?

There are many competing important water-related needs, prior commitments, and other demands for monies drawn from the pool of state-administered funds. Water systems across California face a daunting array of challenges and associated needs for fiscal and technical support, including aging infrastructure, compliance with existing and anticipated new regulations (e.g., MCLs for PFAS), water system resilience

and supply reliability, and seismic risks. Further, there are many additional water-related funding needs and priorities that go beyond drinking water systems. These include managing stormwater and flood risks, nutrient and other wastewater discharge controls, fishery and ecosystem protection and restoration, agricultural irrigation, and others.

Program Target Effectiveness: Has the State properly identified CWSs and households with serious affordability challenges, or are some systems and households in need being overlooked? Likewise, might the State’s approach offer relief where there is a negligible affordability challenge?

The State’s proposed criteria (metrics) and related benchmarks (thresholds) for assessing affordability also serve as the basis for identifying CWSs that will be eligible to receive state funding. Our independent assessment of the State’s occurrence and treatment cost data, in concert with relevant data compiled from the U.S. Census and other sources, reveals that the Board’s approach – which is entirely focused on water systems – overlooks situations where *households* will likely face significant affordability challenges but are not served by a CWS the meets the State’s criteria for assistance.

Likewise, the State’s approach funnels funds to some CWSs that meet the Board’s criteria for needing support, but that serve communities consisting of relatively affluent households for whom the increased water bills are likely to be reasonably affordable. The Board’s proposed fiscal support program can be improved to better identify and reach communities in need, and to avoid subsidizing those for whom affordability (and economic feasibility) is not an issue.

Alternative Affordability Criteria: Empirical Analysis and Findings

The project team developed an independent affordability assessment for the proposed Cr VI MCL. A key difference between our approach and the State’s methodology is that we rely on the Household Burden and Poverty Prevalence Indicators (Raucher et al. 2019) to identify CWSs that would likely need financial assistance to comply with the MCL:

- The Household Burden Indicator (HBI), defined as basic water service costs (combined) as a percent of the 20th percentile household income (i.e., Lowest Quintile Income, LQI, for the service area); plus
- The Poverty Prevalence Indicator (PPI), defined as the percentage of community households at or below 200% of the Federal Poverty Level (FPL).

A matrix approach allows the results of both the HBI and PPI to jointly determine the overall affordability burden of a given community (Table ES-1). In addition to these metrics, we also included impacted CWSs that are designated as “at-risk” on the State’s HR2W list as systems that will likely face affordability challenges in complying with the MCL.

Table ES-1. PPI and HBI affordability burden matrix (Raucher et al. 2019)

HBI: Water sector costs as a percent of upper limit of LQI	PPI: Percent of households below 200% of FPL		
	≥ 35%	20% to 35%	< 20%
> 10%	Very high burden	High burden	Moderate-high burden
7% to 10%	High burden	Moderate-high burden	Moderate-low burden
< 7%	Moderate-high burden	Moderate-low burden	Low burden

For systems not designated with an affordability burden, we identified areas where a disproportionate number of households would likely face affordability challenges and estimated the level of assistance needed to reduce expected water cost increases for these lower-income households. To identify financially challenged households, we relied on Census block- and tract-level data on the percentage of households served by CWSs that pay more than 50% of their income for housing and/or earn less than 200% of the federal poverty level income.

In contrast to the State’s assessment, our estimates of assistance do not include CWSs that would need to recover more than \$30 per month per service connection to comply with the MCL. This is because some of the systems that meet the \$30 criterion do not appear to need financial assistance (i.e., some appear to serve households with very high incomes). However, systems that would need to increase bills by \$30 or more per month should be more closely examined when funding decisions are made, as demographic data for very small systems can have a relatively wide margin of error.

Table ES-2 compares our estimates to those published by the State. As shown, for systems with up to 5,000 service connections, our estimates are lower. This is primarily because of the State’s \$30 per month per service connection threshold, which captures most systems in these size categories irrespective of anticipated household affordability challenges. For systems with greater than 5,000 service connections, our assessment identifies a much greater need for assistance. This is in part because the Board’s assessment only considers the costs of compliance (rather than existing water and sewer costs and irrespective of household ability to pay for compliance). It is also because the State does not identify households that would likely face affordability challenges, but that are served by CWSs that do not meet the State’s affordability criteria.

Table ES-2. Comparison of State and project team financial assistance needs estimates.

System size (service connections)	OWE/Raucher Estimate: Total annual assistance (\$M/year)	State Estimate: Total annual assistance (\$M/year)
Fewer than 100	\$ 2.59	\$ 4.4
100 to 200	\$ 0.99	\$ 1.7
200 to 1,000	\$ 2.34	\$ 3.9
1,000 to 5,000	\$21.9	\$30.0
5,000 to 10,000	\$16.8	\$14.0
10,000 or more	\$ 65.5	\$19.0
Total	\$110.1	\$73.0

Conclusions

The SWRCB’s proposed Cr VI MCL provides an opportunity for the State to ensure drinking water-related public health protection for all Californians can be attained in an affordable and economically feasible manner. The proposed provision of State fiscal support to water systems is commendable. There are important concerns, however, that: (1) the level of fiscal support need is under-estimated and not as well targeted as desired, (2) the State may not have access to as much funding as it claims in the rulemaking package, (3) the funds can be provided to water systems in a timely and administratively streamlined manner, and (4) necessary levels of funding can be sustained over the coming decades, especially given the many competing demands for water-related investments and programs.

1. Introduction

The State of California’s Safe Drinking Water Act (SDWA, or Act) is a statutory vehicle for protecting public health by ensuring drinking water quality meets science-based minimum quality standards. These standards are typically imposed in the form of Maximum Contaminant Levels (MCLs), such as the recently proposed MCL for Hexavalent Chromium (Cr VI) (SWRCB, 2023a).

While essential for public health protection, drinking water standards issued under the SDWA can impose significant costs on Community Water Systems (CWSs) and other water suppliers. Absent state or federal financial assistance, CWS compliance costs are fully borne by the households and businesses served by affected systems. For many households, these additional costs (passed on in the form of increased water bills) can be significant enough to impose an economic hardship. This is often the case for households served by relatively small CWSs, where a lack of economies of scale results in relatively high treatment costs per household. However, MCL-impacted water bills can also impose economic hardship on lower- and fixed-income households in mid-sized and large communities. For communities in which a large portion of households will likely find it difficult to cover compliance-driven water bill increases, household-level affordability poses a very real barrier to the economic feasibility of compliance.

Affordability and economic feasibility have been front and center in the development of the MCL for Cr VI, which was initially approved by the California Office of Administrative Law in 2014. Three years later (in May of 2017), a court ruling invalidated the MCL on the basis that the California Department of Public Health (CDPH) did not properly consider the economic feasibility of compliance. A key tenant of the judge’s ruling was that CDPH did not evaluate affordability when determining the economic feasibility of the MCL, but rather equated economic feasibility with benefit cost analysis.

On June 16, 2023, the State Water Resources Control Board (SWRCB) issued an updated draft MCL that includes a more detailed assessment of the affordability and economic feasibility of the proposed regulation. As described in more detail below, the state applied a range of criteria to identify CWSs that would likely face affordability challenges in complying with the MCL. Based on this assessment, SWRCB determined that the MCL is economically feasible “because there are sufficient resources available to potentially mitigate the challenge of compliance for the systems that are already struggling” (SWRCB ISOR 2023a). In its Initial Statement of Reasons (ISOR) for the Cr VI MCL Regulation, SWRCB also states its intention to provide sufficient financial support to ensure that public health protection standards for essential water and sanitary services can be met in a fair and reasonable manner (SWRCB, 2023a).

State-promised fiscal assistance is a welcome step forward. However, economic feasibility for the proposed MCL requires that the State’s monetary support be sufficient in scale, available on a sustained long-term basis, well targeted to communities and households in need, and relatively easy for small CWSs to access. In addition, while the updated MCL introduces additional metrics for evaluating affordability, there are several aspects of the state’s assessment that could be enhanced to better identify affordability challenges and to ensure sustainable fiscal support needs are met in a more holistic manner – not only for the proposed MCL but for potential future drinking water regulations.

In this report, we present and apply a framework to better characterize affordability challenges, as well as the level of financial assistance required to ensure equitable and efficient public health protection via compliance with the proposed MCL. In addition, we raise key questions and concerns regarding the State’s proposed mechanisms to provide funding to water systems that will struggle to meet the costs of compliance. The analysis and findings presented here were prepared to inform the Community Water

System Association's (CWSA's) and California Association of Mutual Water Company's (CalMutuals') comments to SWRCB on the proposed MCL, and the associations' desire to contribute constructively to future drinking water regulation in California.

2. Defining Affordability, Economic Feasibility, and Economic Hardship

The terminology associated with the ability of households and communities to pay for water services can be defined and interpreted in many ways. This section defines and applies a consistent set of terms, to ensure clarity and minimize the potential for confusion and misinterpretation.

2.1 Subjective Concepts with No Bright Lines

First, it is important to note that the concepts associated with the terminology are subjective. For example, there are not scientifically based "bright lines" that provide a definitive demarcation between what is, and what is not, "affordable" or "economically feasible." The concepts are subjective and open to discussion and interpretation.

Likewise, empirical metrics applied for assessing and measuring "affordability" and related concepts are not definitive. As such, applying a broad suite of metrics (or indicators) and associated benchmarks (thresholds) is most informative, as discussed in subsequent sections of this report.

Further, while not explicitly described in the State's materials, the notion of "economic hardship" is central to considering what is, and what is *not*, affordable and economically feasible. Ultimately, households, communities, water systems, and the State all have budget constraints that require prioritization and tradeoffs on how to allocate their spending.

Within the context of this discussion, economic hardships arise when households with limited means face difficult tradeoffs and need to make spending decisions that ultimately adversely impact the health and safety of household members. Specifically: *Economic hardship arises when a household's ability to pay its share of the community's cost of safe and reliable water service provision interferes with its ability to simultaneously meet all other essential needs (shelter, food, medical care, etc.) for all household members.* Ultimately, the objective is to avoid imposing economic hardship as a sacrifice for receiving safe drinking water.

At the system level, economic hardship arises when a relatively high percentage of customers face affordability challenges, which in turn threatens ability to pay and the economic feasibility of compliance and/or results in tradeoffs across needed investments. This is particularly a challenge for small systems, which do not benefit from "economies of scale" that dominate water purification technologies and have a relatively small number of households sharing the expense.

2.2 The State's Definitions and Perspectives

California's SDWA requires that the State assess and determine that proposed MCLs are "economically feasible" (Health and Safety Code, §116365. Criteria for primary standards). In addition to these requirements, the Act (Health & Safety Code §116270 et seq.) sets out that "Every resident of California has the right to pure and safe drinking water." (§116270 (a)).

In 2017, the California Manufacturers and Technology Association, with support from CalMutuals, filed a lawsuit in Superior Court on the basis that the State did not adequately assess the economic feasibility of

the MCL. The Court agreed with the petitioners¹ and rescinded the Cr VIMCL (Superior Court of Sacramento County, May 2017). While the State had argued that “affordability” was not the same as “economic feasibility,” the Judge’s ruling noted that affordability was implied in some fashion within the context of assessing economic feasibility:

“The Department notes the Safe Drinking Water Act does not define the term “economically feasible,” and it argues the term is not synonymous with “affordable.” Perhaps. But economically feasible has to mean something, and it is difficult to conceive of a definition that does not at least consider affordability.” (Judge Krueger, Superior Court of Sacramento County, May 2017)

In response to the 2017 ruling, the State has explored and suggested ways to define economic feasibility, and ways to assess whether the State believes a regulation to be economically feasible. The State’s distinctions in defining relevant terminology were made explicit in a White Paper released in relation to the Cr VI MCL in 2020 (SWRCB, 2020; p.9):

- Affordability is defined by the State as “the ability of a *household* to pay its own bill.”
- Economic feasibility refers to “the ability of the general state population served by public water systems to pay for compliance to a drinking water standard.”

The White Paper goes on to state:

“The connection between affordability and economic feasibility is complex and beyond the scope of this document. While affordability considers the impact on the individual, economic feasibility focuses on the impact to the community of water systems as a whole...” (SWRCB, 2020. P. 10).

Recent SWRCB rulemakings -- the proposed rule for 123-TCP and the recently issued proposed Cr VI MCL – offer detailed discussion of the factors the State currently applies to define economic feasibility. These rulemaking packages also describe data and analyses the State interprets as supporting a finding that the rulemakings meet the State’s criteria for economic feasibility. (e.g., SWRCB, 2023a: ISOR pp. 40 - 44). However, as in the white paper, the State fails to directly address the economic feasibility and affordability of MCL compliance for water systems, instead relying on pre-MCL affordability designations.

While the State declares the newly proposed Cr VI MCL is *economically feasible*, the SWRCB also acknowledges that *affordability* challenges might exist for many households in MCL-impacted water systems. The rulemaking package describes the State’s evolving approach for assessing where (and how much) State-provided financial support may be warranted for communities facing MCL-related affordability challenges (SWRCB, 2023a).

Providing a suitable amount of State funds to CWSs meeting relevant affordability-related criteria is a valid option to help ensure a rule is economically feasible and “affordable” for all impacted households, and for contributing to the State’s worthy aspirations under its HR2W provisions. However, key issues include whether (or the degree to which):

¹ The lawsuit was filed by the California Manufacturers and Technology Association and informed by CalMutuals’ analysis of the State’s omission of an assessment of the rule’s economic feasibility.

- the State’s proposed criteria (i.e., metrics used as indicators) and related benchmarks (thresholds) for assessing affordability fully identify the communities and households in need
- the State has the fiscal wherewithal and readily accessible pathways for efficiently channeling sufficient monetary support to the CWS, communities, and households facing affordability challenges
- the demand for State funding on Cr VI compliance support does not unduly divert its spending on infrastructure rehabilitation, other water quality regulations and programs, and other necessary investments that may provide greater public health protection benefits to ratepayers.

Compounding these issues is the significant concern among stakeholders that the State’s treatment cost estimates do not reflect on-the-ground realities, and that costs will be much higher than reflected in the State’s analysis. Higher treatment costs would increase both the number of CWSs in need and the amount of fiscal assistance required per system.

The affordability-related metrics and benchmarks applied by the State are described and evaluated in subsequent sections of this report.

2.3 Additional Perspectives on Defining and Supporting Affordability

In the context of a household-level analysis of affordable water service, our perspective is that “affordability” (and the associated concept of economic feasibility) must capture the following:

- Water is an essential service that must be available to all households (access to adequate and reliable supplies of safe and affordable water services is a basic human right).
- Water services must be adequate in quantity and quality to protect public health and safety.
- Essential household water services must be viewed comprehensively as including potable water supply, wastewater collection and treatment, water reuse (where applicable), and stormwater management. Examining drinking water in isolation from household expenses for the full suite of essential water-related services provides a partial and potentially misleading indicator of overall water affordability and economic feasibility.
- The expense of water services (i.e., water bills) must include an accumulation of numerous utility spending needs for essential public health, safety, environmental, and business continuity (and service level) concerns. Water service bills ultimately reflect numerous costly but necessary water utility investments (including compliance with existing and numerous anticipated MCLs for emerging contaminants, infrastructure renewal, water use efficiency, and water system resilience to climate change, seismic events, and other risks).

Water bills must not create *economic hardship* that cause households to make sacrifices on other basic human needs and that may adversely impact their health and safety, such as missing rent/mortgage payments, forgoing meals, missing needed medical visits/treatments or prescription medicines.

3. Measuring Affordability: Criteria, Metrics, and Associated Benchmarks

Not only are the *concepts* of affordability and economic feasibility subjective and open to interpretation, so too are the empirical *metrics* developed and applied to assess these concepts. And, for each metric or indicator, there are infinite possible *benchmarks* (i.e., thresholds, cut-off values) that may be applied to assess whether (or for whom) an economic hardship is imposed.

There have been lengthy discussions and long-standing debates in the policy-making arena and academic literature about what metric(s) best reflect the ability of households -- and/or the communities in which they live (or the utilities that serve those communities) -- to bear the expense of public health and environmental mandates. Ultimately, no single metric can convey the entire range of relevant affordability-related nuances. As discussed below, a suite of carefully defined and measured metrics is needed to effectively convey the complex landscape.

3.1 Metrics and benchmarks applied by California's SWRCB

3.1.1 Percent of median household income: Commonly applied and heavily critiqued

In its White Paper addressing economic feasibility and affordability (SWRCB, 2020), the State describes using the estimated average annual household water bill, compared to the community's median household income (MHI), as its *metric* for assessing household affordability. Subsequently, as part of the *2022 Drinking Water Needs Assessment*, the State developed a series of indicators for identifying water systems with significant affordability burdens – one of which focused on household water bills as a percentage of MHI with an associated threshold of 1.5% (SWRCB, 2022).

The use of MHI-driven metrics has a long history in water regulation and related policies at both the state and federal levels. The U.S. Environmental Protection Agency (USEPA) has applied the “water bill as a percent of MHI” metric since the inception of its wastewater and drinking water regulatory and related enforcement programs, in the 1970s. For example, USEPA's “Financial Capability Assessment” (FCA) methodology has long-relied (in part) on looking at wastewater-and stormwater-related enforcement and compliance schedule adjustments using a “% of MHI” benchmark labeled the “Residential Indicator” (RI).

The specific benchmarks used in conjunction with the “bill as a percent of MHI” metric have varied over time and regulatory context (e.g., the “2% rule of thumb” initially applied for federal wastewater programs, later morphing into 2.5% for drinking water and 2.0 % for wastewater and, thus, a combined benchmark of 4.5% of MHI for federal clean water and drinking water rules combined).

MHI-based metrics and benchmarks also have received longstanding critiques as providing a very limited perspective on household or community-wide affordability, and for being potentially misleading. For example, in a Congressionally mandated review of USEPA water policies, the National Association of Public Administration (NAPA, 2017) provided a wide-ranging critique of the USEPA approach to water sector affordability methods and metrics, largely echoing earlier critiques offered by National Association of Clean Water Agencies (NACWA), U.S. Conference of Mayors, and the Water Environment Federation (WEF). NAPA also recommended several criteria for making significant changes.

Briefly, critiques on using MHI-based indicators of affordability include:

- MHI does not focus on the most economically vulnerable users.

- MHI does not capture impacts across diverse populations.
- MHI is a poor indicator of economic distress, bearing little relationship to poverty or other measures of economic need.

Further, US Census data show that socioeconomic trends since 2000 have increased the percentage of households at the low end of the income spectrum and decreased the percentage of households in the middle (making the “median income household” the least representative type of household in much of the nation). (Raucher et al., 2019)

3.1.2 Moving beyond MHI: Applying criteria from the State’s 2022 Needs Assessment

As noted above, the State Water Board’s Cr VI MCL rulemaking documents move beyond focusing on the simple and limiting “percentage of MHI” metric by incorporating additional indicators developed for the *2022 Drinking Water Needs Assessment* (SWRCB, 2022), combined with a pledge to offer sufficient financial support to systems in need.

The Water Board’s new approach recognizes that baseline water costs and affordability are relevant factors when considering the financial burden of adding a new cost-impacting mandate. It also notes that water systems with persistent noncompliance issues for existing requirements are another relevant mark of limited financial capacity (as reflected by an at-risk designation on the state’s HR2W list) and that on a household-level basis, any rule adding more than \$30 per month to a household water bill may not be affordable.

As stated in the State’s Cr VI MCL rulemaking package (SWRCB, 2023: ISOR, pp. 42 – 43):

“The SWRCB’s approach to considering how much financial assistance would be required to cover the costs of complying with the proposed MCL -- even for systems that might otherwise be fiscally challenged – is based on the following criteria for defining public water systems in need:

- 1) Having a baseline (pre-MCL) medium or high affordability burden, as determined by the State Water Board’s *Drinking Water Needs Assessment* (SWRCB, 2022a);²
- 2) Being placed on the State Water Board’s “Human Right to Water” (HR2W) list;³ and

² The State notes that (SWRCB, 2023. ISOR Pp. 40, 41): “some PWS may already [i.e., before the Cr VI MCL] be charging drinking water service fees that are unaffordable. The State Water Board’s “2022 Drinking Water Needs Assessment” (SWRCB, 2022a) includes an affordability assessment, which identifies CWS with drinking water fees that may be unaffordable for their consumers. Out of 2,868 community water systems analyzed, 1,566 charge fees that exceed at least one “risk indicator” threshold for unaffordability. Risk indicators include whether average fees exceeded a certain percentage of median household income; whether fees exceeded a percentage of average statewide drinking water fees; whether a high percentage of customers are past-due on their bills; and the amount of residential arrearages accrued during a certain time period, if distributed across the residential rate base.

³ As part of the Human Right to Water in California, the State Water Board identifies and lists PWS that consistently fail to meet primary drinking water standards. More information about the Human Right to Water can be found at: https://www.waterboards.ca.gov/water_issues/programs/hr2w/. (SWRCB, 2023. ISOR p. 42)

- 3) Needing to recover more than \$30 per month per service connection to comply with the proposed primary drinking water standard.⁴

The State notes that it did not rely only on Disadvantaged Community (DAC) status to determine how much financial assistance would be required to cover the costs of complying with the proposed MCL, because DAC status was found to not correlate with a medium or high affordability burden (SWRCB, 2022a).⁵

The SWRCB then concludes in its rulemaking documents that it has the financial capability to readily support all MCL-impacted water systems attain compliance with the Cr VI MCL in an economically feasible manner:

“The State Water Board then compared the amount of financial assistance necessary to cover those costs of compliance with the amount of financial assistance funding available from the State Water Board’s Division of Financial Assistance. The result shows that less than 1% of available funding would be required to cover these costs of compliance with the proposed MCL.... While the State Water Board cannot, through this rulemaking process, guarantee financial assistance to any particular recipient, this analysis supports the economic feasibility of the MCL because there are sufficient resources available to mitigate the challenge of compliance for the systems that are already struggling with financial capacity.” (SWRCB, 2023a: ISOR, P. 44)

It is important to note that SWRCB originally misreported the amount of fiscal support required to be \$6.1 million per year, hence the 1% figure in the passage quoted above from the ISOR. Subsequently, the State acknowledged an error in its calculated needs estimate and issued an updated fiscal support needs estimate of \$73 million annually (SWRCB, 2023b). Thus, the State’s estimate of need amounts to 9% of its stated amount of total available funding (which is claimed to amount to \$823 million, as discussed further and critiqued in a subsequent portion of this report).

3.3 Additional Metrics and Benchmarks to Consider

There are myriad ways to assess affordability and to estimate the associated level of financial assistance required to ensure affordability and related economic feasibility criteria are met. For example, in lieu of using the increasingly nonrepresentative MHI, using the Lowest Quintile of Income (LQI) has been put forward as a useful improvement for affordability assessments. The LQI reflects the income for households at the 20th percentile of the area’s income distribution. Incorporating LQI into affordability assessments therefore provides a more accurate representation of households who are likely to face affordability challenges. In addition, many assistance programs have eligibility thresholds at or near the 20th percentile, and the data used to define LQI household income is readily available from the U.S. Census at most geographic scales.

⁴ PWS needing to recover more than \$30 per month from its customers for hexavalent chromium treatment were considered by the State because “it is more likely that the customers of these systems will struggle to afford water cost increases, which (without other assistance) may limit the ability of these systems to recover the costs of complying with the hexavalent chromium MCL” (SWRCB 2023. ISOR p. 41)

⁵ Of the 1,366 PWS designated as DAC or Severely Disadvantaged Community (SDAC), 1,128 PWS were categorized as having low to no affordability burden. (SWRCB, 2022a) (SWRCB, 2023. ISOR p.43).

Multiple metrics (and associated benchmarks) can and should be developed and jointly applied to provide a more comprehensive and insightful assessment of household affordability and water system financial capability. This includes metrics that capture the *prevalence* of economic hardship within a community, such as the percent of the local work-aged population that is unemployed, and/or the percent of local households living below the federal poverty level (FPL) or with income less than twice the FPL (200% of the FPL is generally regarded as a key threshold for economic hardship and poverty). Several researchers have also developed approaches for assessing how the local cost of living (and more importantly, the cost of other basic necessities) affects the affordability of water services in specific communities.

3.3.1 Combining household burden with community-level prevalence of economic hardship

In 2019, the American Water Works Association (AWWA), WEF, and NACWA put forth a framework for evaluating household affordability within the context of USEPA regulatory enforcement and compliance timelines for drinking water and wastewater-related mandates (Raucher et al., 2019). The intent of this effort was to develop metrics that would be: (1) meaningful for identifying and assessing household affordability and financial capability within a given community; (2) implementable for users, and (3) trustworthy (i.e., as accurate and credible as possible).

Three criteria emerged as the most important to guide the framework development - specifically, that the framework should incorporate metrics that:

- Reflect all/combined water service costs,
- Address households that are most economically challenged,
- Reflect local essential costs of living.

The authors of the agency-sponsored report also recommended that the framework and associated metrics should:

- be straightforward, transparent, and support consistent application.
- encompass both household affordability (rate payer burden) and the financial capability of the water system providing the services and the community receiving the services.
- use valid and defensible measures that rely upon readily available data from relevant verifiable sources.
- allow for flexibility in defining and identifying a water system's potential financial and economic burdens.
- be applicable to a broad range of purposes.
- be defensible in determining relative burdens.

Based on the above criteria, the report suggested the following combination of household affordability indicators (Raucher et al., 2019):

- The Household Burden Indicator (HBI), defined as basic water service costs (combined) as a percent of the 20th percentile household income (i.e., LQI for the service area); plus
- The Poverty Prevalence Indicator (PPI), defined as the percentage of community households at or below 200% of FPL.

A matrix approach allows the results of both the HBI and PPI to jointly determine the affordability burden of a given community (as portrayed in section 4). There are several benefits to this paired metrics approach. First, the HBI measures the economic burden that relatively low-income households in a community face in paying their water services bills (including water, wastewater, and stormwater bills), while the PPI measures the degree to which poverty is prevalent in the community. Thus, in combination, these two metrics indicate both a household-level burden *and* the community-based prevalence of the affordability challenge posed by water sector costs.

Pairing the two metrics is relatively simple, easy-to-implement, and transparent. In addition, this approach relies upon readily available, federally furnished data. It also can be developed to reflect all water sector service costs. Applying these metrics focuses on low-income populations to better recognize the local distribution of incomes and to examine which segments of a community are most vulnerable to affordability challenges.

3.3.2 Reflecting variations in local cost of living

While it would be informative to incorporate key differences in the local cost of living for basic and essential needs (e.g., housing) into the recommended affordability measures, Raucher et al. (2019) reported that no metric was found to effectively capture this information in a broadly applicable and suitably reliable manner for all the U.S., at least not based on readily accessible data.

While some metrics exist that capture other essential household needs or the local cost of living -- such as the Low-Income Housing Burden (available from the U.S. Census for some communities), the Affordability Ratio at the 20th Percentile (Teodoro 2018), and the MIT Living Wage -- these measures have limitations or tradeoffs that prevent their recommendation for a core household-level affordability assessment methodology.

However, where feasible, it is strongly recommended to include supplemental measures that consider the cost of other essential household needs and the local cost of living; for example, the United Way's Asset Limited, Income Constrained, and Employed (ALICE) methodology. As discussed in more detail below, the project team incorporated data from the U.S. Census Bureau to examine the amount that low-income households pay for rent as a percentage of their income. This information is available at the Census tract and block group level in California.

4. Economic Feasibility and Affordability for the Cr VI MCL

This section provides an overview and evaluation of the state's economic feasibility and affordability assessment for the Cr VI MCL and applies additional metrics to examine affordability and evaluate the need for financial assistance by impacted CWSs.

4.1 The State's Approach and Findings

4.1.1 The State's affordability indicators and thresholds

As described above, SWRCB's approach to considering how much financial assistance would be required to cover the costs of complying with the proposed MCL is based on three sets of criteria for defining public water systems in need (SWRCB, 2023: ISOR pp. 42 – 43).

- 1) Having a baseline (pre-MCL) medium or high affordability burden, as determined by the State Water Board's *Drinking Water Needs Assessment* (SWRCB, 2022a). The Needs Assessment includes four indicators for determining affordability burden:
 - a. **Percent of MHI.** This indicator measures annual system-wide average residential water charges for six Hundred Cubic Feet (HCF) per month relative to the MHI within a water system's service area. The threshold for this indicator is 1.5%.
 - b. **Extreme Water Bill.** This indicator measures drinking water customer charges that meet or exceed 150% and 200% of statewide average drinking water customer charges at the six HCF level of consumption.
 - c. **Percent of Residential Arrearages.** This indicator identifies water systems that have a high percentage of residential customers who have not paid their water bill for at least 60 days.
 - d. **Residential Arrearage Burden.** This indicator identifies water systems that would have a high residential arrearage burden if they were to distribute their residential arrearages accrued during the COVID-19 pandemic period (March 4, 2020 through June 15, 2021) across their total residential rate base. This indicator measures how large of a burden non-payment is across the water system's full residential customer base.

Water systems exceeding two of these thresholds are designated as having a medium affordability burden; those exceeding three or four of the thresholds have a high burden.
- 2) Systems on the Water Board's "Human Right to Water" (HR2W) list
- 3) Systems needing to recover more than \$30 per month per service connection to comply with the MCL.

4.1.2 Concerns with the state's affordability indicators and thresholds

The 2022 *Drinking Water Needs Assessment* (SWRCB, 2022) notes that percentage of MHI is commonly used by state and federal regulatory agencies and by water industry stakeholders for assessing community-wide water charges affordability. However, as described above, there are several limitations associated with this metric. While used in tandem with additional metrics in the State's *Needs Assessment*, the use of MHI still provides limited insight on the effect of increased water service costs on low-income households. As an example, of the 160 impacted systems in the state's Cr VI dataset, 25 have water and sewer bills that are less than 2.5% of MHI (including the costs of compliance, set at 2.5% because the bills include sewer costs) but greater than 7% of the lowest quintile income (LQI). In 23 systems, water and sewer bills are less than 2.5% of MHI and less than 4% of LQI. Customers within the lowest income quintile in the former communities would face much greater challenges than those in the latter.

Likewise, while high water rates (as examined by the extreme water bill indicator) can help to identify systems with potential affordability challenges, this indicator may also capture systems who are fortunate enough to be able to pay for needed compliance with other drinking water rules and/or for investments in aging infrastructure. When not compared to incomes at the lower end of the spectrum (rather than at the median), this metric does not fully capture affordability challenges (although when paired with the other indicators, this metric does provide one piece of the puzzle).

While the percentage of residential arrearages presumably aims to assess the prevalence of affordability challenges within a community, it does not capture the tradeoffs that low-income households may have

had to make to pay their water bill. Likewise, it is curious that the residential arrearage burden is based on arrearages incurred during the Covid pandemic when many households faced affordability challenges. Conditions during the Covid pandemic capture a snapshot in time and do not represent long term trends.

Another concern with the *2022 Drinking Water Needs Assessment* metrics is that they are based on pre-MCL estimates, rather than reflecting increased treatment costs for impacted systems. Of the 160 systems expected to be impacted by the MCL, 104 (65%) will need to recover more than \$30 per service connection per month (\$360 per year) to comply with the MCL. Treatment costs for these CWSs are captured in the state's estimate of financial need based on the \$30 per service connection criteria. However, households paying \$29 per month are not. Based on data from the Bureau of Labor Statistics, California households paid an average of \$936 per year for water, sewer, and trash services in 2021; households within the lowest income quintile paid \$511 annually, on average. For these lower income households, an additional \$348 per year (the amount associated with \$29 per month cost of compliance), represents a 68% rate increase and would likely have significant implications on household finances.⁶

In addition, to place the \$30 per month threshold into context, note that \$360 per year is 1.5% of a household income of \$23,200. Thus, the incremental costs of compliance alone, at or near \$30 per month, will exceed the 1.5% of income for households earning less than this amount. Our analysis indicates that half of impacted CWSs are located in Census areas (i.e., tracts, block groups, or places) where the upper limit of the LQI is less than \$23,200 per household (and in many areas, it is much lower).

The state acknowledges that the \$30 per month per service connection threshold is somewhat arbitrary (and, almost all systems with 1,000 service connections or less meet the \$30 requirement). However, the \$30 per month eligibility criterion also captures CWSs serving communities that may not need assistance. As an example, one system with fewer than 100 service connections will face cost increases of approximately \$98 per month. While high for many households, the MHI in this community is \$169,700 and the LQI is close to \$40,000. For this system, targeted assistance to low-income households would likely be a better use of public funds than a full system subsidy to cover the full cost of treatment. The study team identified 31 such systems – i.e., CWSs that will face costs of greater than \$30 per month per service connection but, based on our criteria (described in more detail below) do not have a high affordability burden.

Finally, the state's analysis also does not evaluate the impact on low-income households in systems that are not designated with an affordability burden (e.g., large systems with a high percentage of low-income households), nor does it consider the high cost of living in many areas of California. It is expected that many households will experience affordability challenges in the face of increased water bills resulting from the MCL, including households in CWSs that will not qualify for assistance under the State's criteria.

4.1.3 State's findings and estimates of financial assistance needed for Cr VI MCL compliance

Table 1 presents the results of the State's cost of treatment and affordability analysis, by system size (categorized by number service connections), as presented in the State's proposed rulemaking package (SWRCB, 2023a). As shown, a total of 160 CWSs are expected to be impacted by the MCL, with a total estimated annual cost of compliance amounting to more than \$172 million per year. The State estimates

⁶ The US Bureau of Labor Statistics reports that the average annual income for the lowest 20 percent of income earners in California is \$15,020 per year (2021 BLS CEX).

that the compliance costs for systems identified as facing affordability challenges (based on the State’s criteria outlined above) would amount to \$73 million per year, approximately 42% of total annualized compliance costs statewide (SWRCB, 2023b).

Table 1. Results of State’s Affordability Assessment for Cr VI MCL (Source: SWRCB, 2023a, 2023b)

System size category (service connections, SCs)	<100	100– 200	200– 1,000	1,000 - 5,000	5,000– 10,000	10,000+	Total
Systems impacted by MCL	62	14	15	26	12	31	160
Annual costs of compliance (\$M) ^a	\$4.4	\$1.7	\$ 4.2	\$33.6	\$22.3	\$ 106.6	\$172.7
Average monthly cost per SC	\$135	\$67	\$54	\$39	\$21	\$8	--
State estimate of CWS affordability challenge needs (amount of assistance needed annually, \$M)	\$4.3	\$1.7	\$3.9	\$30.0	\$14.0	\$19.0	\$73
State estimate of total assistance needed as percent of total CWS annualized compliance costs	100%	100%	93%	89%	63%	18%	42%
State estimate of the number of households (SCs) in systems with affordability challenges ^b	2,664	2,030	4,884	49,648	29,038	51,021	139,285^c

- a. Estimated by state based on best available technology assumptions; annualized over 20-year period with a 7% interest rate (ISOR Attachment 2, SWRCBc 2023)
- b. Note: the state’s assessment equates service connections to households
- c. The errata sheet published by the state (SWRCB, 2023b) presents two numbers for the number of households in CWSs that would benefit from financial assistance – 139,285 (in errata for p. 50 of the ISOR) and 135,760 (in errata for p. 61).

4.2 Applying Additional Metrics to Assess Financial Support Needs

The project team developed an independent assessment of affordability challenges, and associated estimates of fiscal support needs, for CWS compliance with the proposed Cr VI MCL. The following sections describe our methods and data and present our results and key findings.

As described in more detail below, a key difference between our approach and the State’s methodology is that we rely on the HBI and PPI metrics (described in Section 3.3), to identify MCL-impacted CWSs that would likely need financial assistance to comply with the MCL. Following the State’s approach, we also included CWSs that are designated as “at-risk” on the State’s HR2W list in this category. In addition, for systems not designated with an affordability challenge, we identified areas where a disproportionate number of households will face affordability challenges and estimated the level of assistance needed to reduce expected water cost increases for these lower-income households.

Our estimates of assistance needed across system size categories do not automatically include CWSs that would need to recover more than \$30 per month per service connection to comply with the MCL, but rather rely on the criteria described in the previous section to identify financially challenged CWSs and households. This is because some of the systems that meet the \$30 criterion do not appear to need

financial assistance based on metrics that better assess affordability (i.e., some appear to serve households with very high incomes). However, in our discussion below, we have reported the additional amount that would be needed to assist these systems (net of the assistance needs identified for designated systems and households) to provide an upper end range of assistance needed. Systems that would need to increase bills by \$30 per month should be more closely examined when funding decisions are made, as demographic data for very small systems can have a relatively wide margin of error.

4.2.1 Methodology

The project team applied a series of additional affordability metrics to better understand the potential affordability challenges for systems impacted by the MCL. To conduct this assessment, we relied on the State’s comprehensive Cr. VI dataset, as well as data presented in the ISOR (SWRCB, 2023a, including Attachments 1 and 5), to identify impacted systems and their associated compliance costs.

Next, we used the State’s spatial data for water system boundaries to tie each impacted system to a geographic unit for analysis – i.e., Census Block Group, Tract, and/or Census Designated Place, depending on system size. This was done using Geographic Information Systems (GIS), overlaying Census unit and water system boundaries. For each system, we identified the number of intersecting Census units (e.g., block groups and tracts) and determined the appropriate scale of analysis. Given the limited time period for public comment, we focused our analysis on CWSs.

Next, we collected socioeconomic data at the relevant geographic scale, including data on MHI, upper limit of the LQI, household water and sewer costs, income to poverty ratios, and percentage of income spent on housing. Data was weighted to reflect the water system. Thus, if a water system was made up of two Census tracts, the socioeconomic data was weighted to reflect the percentage of each tract that fell within the water system, as well as the percentage of the water system that each Census tract made up (depending on the variable).

Many of the impacted systems are extremely small (e.g., with less than 100 service connections) - these systems are often smaller than their corresponding Block Group from the Census. For these small systems, it is difficult to collect accurate socioeconomic data (short of a Census/water system survey). However, this assessment aims to provide an overall idea of existing conditions in the general location of these systems. It is not intended to specifically identify those systems that should receive public funding.

In addition, some socioeconomic variables published by the Census are not available at the Block Group level. Most notably for this analysis, the upper limit of the LQI and data on household water and sewer costs are not available at the Block Group level. The Census does, however, publish income distribution data (i.e., the number of households within set income categories). We used these income distribution data to estimate the LQI for our analysis of affordability in the very small CWS. We relied on tract level data to approximate household water and sewer bills.

The outcome of this effort is a comprehensive dataset of systems impacted by the MCL (i.e., the State’s occurrence database), corresponding socioeconomic data, water system information, and data relevant to the compliance costs (e.g., estimated annual costs, costs per service connection, using the State’s treatment cost estimates). The dataset allowed us to apply affordability metrics across system size categories and to identify systems and households that would likely face affordability challenges due to increased water bills associated with the proposed ruling.

The project team applied the HBI and PPI metrics described in a previous section. Based on these metrics and the matrix presented in Table 2, we identified systems with a very high, high, and moderate-high

affordability burden.⁷ Like the state, we also included systems on the HR2W list in our assessment of CWSs that would likely need financial assistance to comply with the MCL.

Table 2. PPI and HBI affordability burden matrix (Raucher et al. 2019)

HBI: Water sector costs as a percent of upper limit of LQI	PPI: Percent of households below 200% of the Federal Poverty Level		
	≥ 35%	20% to 35%	< 20%
> 10%	Very high burden	High burden	Moderate-high burden
7% to 10%	High burden	Moderate-high burden	Moderate-low burden
< 7%	Moderate-high burden	Moderate-low burden	Low burden

As noted above, in addition to identifying the financial assistance need for CWSs designated as facing affordability challenges, we also identified the need for assistance for low-income *households* in non-designated systems. That is, we identified households likely to face economic hardship resulting from increased water costs, but that are served by CWSs not meeting our defined affordability thresholds. We estimated this need for systems where more than half of low-income renters are paying more than 50% of their income for housing (and thus have a “severe housing burden”). To quantify this need, we assumed that households earning less than 200% of the FPL would require assistance in these communities. Like the state, we equated service connections to households; however, a more refined analysis could estimate the number of households within a service area (and proportional costs for households).

As an important note, we did our best to match the State’s Cr VI dataset (which contained the public water system identification numbers for MCL-impacted water systems) to Attachment 5 of the ISOR (which kept impacted systems anonymous). This allowed us to identify a geographic location for impacted systems, as well as expected compliance costs. Our results indicate that we were able to match impacted systems across these datasets. For some CWS size categories, our compliance cost estimates do not *exactly* match those reported by the State – however, they are within 1% to 2%. It is likely that this very small discrepancy is due to rounding applied through the different analyses.

4.2.2 Affordability challenges and estimated financial assistance need by system size

This section presents the results of our assessment by system size category and compares our findings to the estimates of financial assistance needs presented in the ISOR.

CWSs serving fewer than 100 service connections

The State reports that there are 62 CWSs within this category that would be impacted by the MCL, comprising 2,664 households (service connections). The estimated annualized cost of MCL compliance for these systems amounts to \$4.3 million per year (SWRCB, 2023: ISOR P.50).

In its affordability assessment, the State reports that 9 of the 62 systems in this category are on the HR2W list (note that our analysis identified 11 systems from the California HR2W website), eight have a medium affordability burden (one of which is a HR2W system), and none have a high burden according to the

⁷ Note that the HBI benchmarks for percent of LQI are intended to reflect the combined water services costs per household, including wastewater and stormwater services as well as potable supply. This report relies on American Community Survey data on household water and sewer costs to estimate these amounts. However, the wording of the Census question, as well as uncertainties related to water vs. sewer bills at the household level, could lead some to only report drinking water costs. This would result in an understating of the affordability challenges faced by MCL-impacted households in this report.

State's 2022 Needs Assessment criteria. The State's estimated average cost of compliance per service connection is \$135 per month.

In this size category, the minimum cost per service connection is \$54 per month (per the ISOR); thus, all CWSs within this category meet the State's criteria for financial assistance because they would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. Thus, the State's corrected estimate of fiscal support needs for this system size category is equal to total compliance costs (\$4.32 million per year). The State does indicate that these systems have the option of adopting point of use (POU) systems, although the SWRCB's estimated monthly cost of POU systems is more than \$30 per service connection.⁸

Setting aside the \$30 monthly water bill increase per connection classification, the State identified 16 systems in need of assistance in this size category. This includes eight CWSs on the HR2W, seven that are designated with a medium affordability burden based on the State's 2022 Needs Assessment, and one that meets both criteria. In comparison, our analysis indicates that 34 systems would be classified as having a very high, high, or moderately high burden based on the HBI and PPI methodology (top row of Table 3). Two additional systems that are not designated as having a very high, high, or moderate-high burden are on the H2RW list. This yields 36 CWSs identified as needing financial assistance (as reported on row 3 of Table 3). An additional six non-designated systems (i.e., CWSs that are not in the high burden categories nor on the HR2W list) are estimated to have more than 50% of low-income renters with a severe housing burden.

The total need for assistance for systems designated with a very high, high, or moderate-high affordability burden, or on the HR2W list, amounts to \$2.6 million per year, as shown in the fourth row of Table 3. Based on the percentage of low-income households paying more than 50% of their income for housing, an additional \$74,121 per year would be needed to assist customers in non-designated systems.

Note that our estimate of assistance does not automatically include systems that would need to recover more than \$30 per month per service connection to comply with the MCL, but rather applies the HBI and PPI (and the HR2W) to identify these systems. However, in Table 3 we have included the additional amount that would be needed to assist these systems.

CWSs serving 100 to 200 service connections

The State reports that there are 14 CWSs within this category that would be impacted by the MCL and estimates a total annual compliance cost of \$1.64 million (plus monitoring expense) for these systems. Per the ISOR, none of these systems are on the HR2W list (although our analysis identified one system) and one has a medium affordability burden (none have a high burden based on the State's 2022 Needs Assessment). The average cost of compliance per service connection is \$67 per month.

⁸ POU as a compliance option may be a viable approach for some small systems, especially considering possible co-benefits of multiple contaminants being removed. However, the regulatory compliance approach as currently framed makes POU an unlikely option (e.g., needing every SC to comply and properly install and maintain the systems). State language regarding POU also limits this option to an interim period until centralized treatment can be put in place.

Table 3. Affordability Assessment Results, Systems with Fewer than 100 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	34 (55%)
Number of H2RW CWSs	11 (18%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	36 (58%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$2,523,864
Total annual assistance for low-income households in non-designated CWSs	\$74,121
Total annual assistance needed (OWE/Raucher estimate)^a	\$2,597,985
Additional potential assistance need, communities w/costs > \$30 per SC ^b	\$1,655,810
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$4,253,795

- a. Our total cost estimates for this category differ from what the state reports in the ISOR by approximately 1.6%; the total annual assistance is equal to total costs for this system size category.
- b. This estimate is net of the \$2,597,985 in assistance for designated systems and households

In this category, the minimum cost per connection is \$34 per month (per the ISOR); thus, all systems within this category meet the State’s criteria for financial assistance because they would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. The State’s corrected estimate of fiscal support need of \$1.7 million thus reflects covering the full expense for all MCL-impacted systems.

Setting aside the \$30 per month per connection classification, the State identified one system in need of assistance in this size category. Our analysis indicates that nine systems would be classified as having a very high, high, or moderately high burden based on the HBI and PPI methodology (one of these systems is also on the HR2W list). No non-designated systems have more than 50% of low-income renters with a severe housing burden. The total need for assistance across systems designated with a very high, high, or moderate-high affordability burden or that are on the HR2W list amounts to \$986,035. Table 4 presents these results and shows the additional amount that would be needed to assist systems that are not designated with an affordability burden or on the H2RW list, but that meet the State’s \$30 per month per service connection. This is intended to provide an upper end estimate on the range of assistance needed.

Table 4. Affordability Assessment Results, Systems with 100-200 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	9 (64%)
Number of H2RW CWSs	1 (7%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	9 (64%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$986,035
Total annual assistance for low-income households in non-designated CWSs	N/A
Total annual assistance needed (OWE/Raucher estimate)^a	\$986,035
Additional potential assistance need, communities w/costs > \$30 per SC ^b	\$633,886
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$1,619,921

- a. Our total cost estimates for this category differ from what the state reports in the ISOR by approximately 1.3%; the total annual assistance is equal to total costs for this system size category.
- b. This estimate is net of the \$986,035 in assistance for designated systems and households

CWS serving 200 to 1,000 service connections

Per the ISOR, there are 15 CWSs within this category that will be impacted by the MCL, with an estimated total compliance cost of \$4.1 million. Two of these systems are on the HR2W list (although our analysis identified only one system), one has a medium affordability burden, and none has a high burden based on the 2022 Needs Assessment. The average cost of compliance per service connection is \$54 per month. In this category, the minimum cost per connection is \$16 per month (per the ISOR); however, ten systems

would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. The corrected State estimate of financial assistance needed for systems within this size category is \$3.9 million per year (SWRCB, 2023b).

Setting aside the \$30 per connection classification, the State identified two systems in need of assistance in this size category – the system with a medium affordability burden is also on the HR2W systems list. Our analysis indicates that nine systems have a very high, high, or moderately high burden based on the HBI and PPI methodology, including the system we identified as being on the H2RW list rows 1 and 3 in Table 5). In addition, two non-designated systems are estimated to have more than 50% of low-income renters paying more than 50% of their income for housing.

The total need for assistance across systems designation with a very high, high, or moderate-high affordability burden or on the HR2W list amounts to \$2.3 million. Based on the percentage of low-income households paying more than 50% of their income for housing, an additional \$38,890 per year would be needed to assist customers in non-designated systems. An additional \$1.5 million would be needed to assist systems that are not designated with an affordability burden or on the H2RW list, but that meet the State’s \$30 per month per service connection.

Table 5. Affordability Assessment Results, Systems with 200-1,000 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	9 (60%)
Number of H2RW CWSs	1 (7%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	9 (60%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$2,303,485
Total annual assistance for low-income households in non-designated CWSs	\$38,890
Total annual assistance needed (OWE/Raucher estimate)	\$2,342,375
Additional potential assistance need, communities w/costs > \$30 per SC ^a	\$1,466,789
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$3,809,164

a. This estimate is net of the \$2,342,375 in assistance for designated systems and households

CWS serving 1,000 to 5,000 service connections

The State reports that 26 CWSs within this category are expected to be impacted by the MCL. Two of these systems are on the HR2W list, three have a medium affordability burden, and two have a high burden based on the 2022 Needs Assessment. The average cost of compliance per service connection is \$39 per month and 13 of the 26 systems would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. The ISOR Errata Sheet reports a total annual financial assistance need for systems within this category of \$30 million (SWRCB, 2023b). This compares to the State’s total estimated annual compliance costs of \$33.6 million.

Without the \$30 per connection classification, the State identified up to seven systems in need of assistance in this size category – it is not clear from the text if any of the HR2W systems are also those with a medium or high affordability burden. Our analysis indicates that 15 systems within this size category have a very high, high, or moderately high burden based on the HBI and PPI methodology, including the two systems on the H2RW list. In addition, nine non-designated systems are estimated to have more than 50% of low-income renters paying more than 50% of their income for housing.

As detailed in Table 6, the total need for assistance across systems designated with a very high, high, or moderate-high affordability burden or on the HR2W list amounts to \$19.3 million per year. Based on the percentage of low-income households paying more than 50% of their income for housing, an additional

\$2.6 million would be needed annually to assist customers in non-designated systems. Combined, we estimate fiscal support needs of \$21.9 million per year for MCL-impacted CWS in this size category. An additional \$9.4 would be needed to assist systems that are not designated with an affordability burden or on the H2RW list, but that meet the State’s \$30 per month per service connection.

Table 6. Affordability Assessment Results, Systems with 1,000-5,000 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	15 (58%)
Number of H2RW CWSs	2 (8%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	15 (58%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$19,300,617
Total annual assistance for low-income households in non-designated CWSs	\$2,596,363
Total annual assistance needed (OWE/Raucher estimate)	\$21,896,980
Additional potential assistance need, communities w/costs > \$30 per SC ^a	\$9,371,246
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$31,268,226

a. This estimate is net of the \$21,896,980 in assistance for designated systems and households

CWS Serving 5,000 to 10,000 Service Connections

The state reports that 12 CWSs within this category are expected to be impacted by the MCL. None of these systems are on the HR2W list, one has a medium affordability burden, and none have a high burden based on the State’s 2022 Needs Assessment. The average cost of compliance per service connection is \$21 per month, although three of the 12 systems would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. The ISOR Errata Sheet (SWRCB 2023b) reports a total annual financial assistance need for systems within this category of \$14 million. This compares to the State’s total estimated annual compliance costs of \$22.3 million.

Without the \$30 per connection classification, the State identified one system in this size category in need of financial assistance. Our analysis indicates that six systems have a very high, high, or moderately high burden based on the HBI and PPI methodology. In addition, four non-designated systems are estimated to have more than 50% of low-income renters paying more than 50% of their income for housing.

As shown in Table 7, the total need for assistance across systems designated with a very high, high, or moderate-high affordability burden amounts to \$15.8 million. Based on the percentage of low-income households paying more than 50% of their income for housing, an additional \$984,538 would be needed to assist customers in non-designated systems. In total, we estimate a fiscal support need of \$16.8 million per year for systems in this size category, compared to the State’s estimated annual need of \$14 million. No non-designated CWSs in this size category would need to charge more than \$30 per month per service connection.

Table 7. Affordability Assessment Results, Systems with 5,000-10,000 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	6 (50%)
Number of H2RW CWSs	0 (0%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	6 (58%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$15,780,489
Total annual assistance for low-income households in non-designated CWSs	\$984,538
Total annual assistance needed (OWE/Raucher estimate)	\$16,765,027
Additional potential assistance need, communities w/costs > \$30 per SC	\$0
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$16,765,027

CWS serving 10,000 or more service connections

Per the ISOR, there are 31 CWSs within this category that will be impacted by the MCL. None of these systems are on the HR2W list, two have a medium affordability burden, and none have a high burden based on the State's 2022 Needs Assessment. The average cost of compliance per service connection is \$8 per month; although 2 of the 31 systems would need to recover more than \$30 per month per service connection to pay for Cr VI treatment. The ISOR Errata Sheet reports a total annual financial assistance need for systems within this category of \$19 million. This compares to the State's total estimated annual compliance costs of \$106.6 million.

Without the \$30 per connection classification, the State identified two systems in this size category that would need financial assistance to comply with the MCL. In contrast, our analysis indicates that 12 systems have a very high, high, or moderately high burden based on the HBI and PPI methodology (this includes the two systems that would need to charge more than \$30 per service connection per month). In addition, 18 non-designated systems are estimated to have more than 50% of low-income renters paying more than 50% of their income for housing.

Our findings are provided in Table 8. The total need for assistance across systems designated with a very high, high, or moderate-high affordability burden amounts to \$52.5 million. Based on the percentage of low-income households paying more than 50% of their income for housing, an additional \$13.0 million would be needed to assist customers in non-designated systems. In total our estimate of financial assistance need amounts to \$65.5 million per year. No non-designated CWSs in this size category would need to charge more than \$30 per month per service connection.

Table 8. Affordability Assessment Results, Systems with more than 10,000 Service Connections	
CWSs with very high, high, or moderate high burden based on HBI/PPI	12 (39%)
Number of H2RW CWSs	0 (0%)
Total number of CWSs in need of assistance (CWSs w/designated burden and/or on HR2W list)	12 (39%)
Annual assistance for systems with HBI/PPI burden or on HR2W list	\$52,507,974
Total annual assistance for low-income households in non-designated CWSs	\$12,988,770
Total annual assistance needed (OWE/Raucher estimate)	\$65,496,744
Additional potential assistance need, communities w/costs > \$30 per SC	\$0
Total annual assistance needed (OWE/Raucher estimate + \$30 per SC)	\$65,496,744

Overall, for the CWS in the largest size category (more than 10,000 service connections), we have identified a considerably greater level of fiscal support need than estimated by the State -- \$65.5 million per year as compared to the State's estimate of \$19 million of fiscal assistance annually. This is driven by a greater number of communities meeting the HBI/PPI criteria compared to the 2022 Needs Assessment thresholds. In addition, relatively few systems in this size category would need to recover more than \$30 per month per service connection, thus they are not included in the state's estimate, even though many seemingly face affordability challenges. Finally, we have identified substantial financial assistance needs for households within this size category who are served by non-designated systems.

4.2.3 Summary and comparison of results

Table 9 summarizes the project team's total estimated need for assistance, by system size category. While these estimates are not intended to provide an exact estimate of need (e.g., the State could provide assistance on a sliding scale for systems with a moderate-high to very high PPI-HBI burden), it is clear that the MCL will impose economic hardships on many CWSs and households across the state. In addition,

while our primary estimates do not include the cost of treatment for CWSs with a cost per service connection of greater than \$30 per month if they do not meet the HBI/PPI or HR2W criteria; however, we have included the additional cost of compliance for these systems as many are likely candidates for additional evaluation (on a case-by-case basis) to determine financial need.

Table 10 compares our estimates to those published by the State (as updated in an errata sheet to the ISOR on 7/31/2023). As shown, for systems with up to 5,000 service connections, our estimates are lower. This is primarily because the State selected \$30 per month per service connection as an affordability threshold, thereby capturing most systems in these size categories irrespective of affordability challenges. The application of the \$30 per month threshold likely results in an estimate of need that includes several systems that are likely not in need of financial assistance to fully cover the cost of treatment.

For systems with greater than 5,000 service connections, our assessment identifies a much greater need for assistance. The difference in estimates is in part because the State's assessment only considers the costs of compliance (rather than existing water and sewer costs and irrespective of household ability to pay for compliance). It is also because the State does not identify households that would likely face affordability challenges, but that are served by CWSs that do not meet the state's affordability criteria. In total, our lower end estimate amounts to 13% of the total funding the State has indicated is available to address affordability challenges (up from 9% associated with the State's estimate of need).

5. State Funding Availability and Access

The State's pledge of financial assistance is a critical component of ensuring affordable and economically feasible access to safe water for all Californians. SWRCB believes that the level of financial support it is proposing is feasible and reasonable, given that its estimated need of \$73 million per year presumably will be drawn from a much larger pool of \$823 million in State-administered fiscal resources available for water-related purposes. The State notes that its estimated annual funding needs amount to only 9% of the \$823 million it points to as the total available amount of funding resources (SWRCB, 2023a, 2023b). However, there are several concerns regarding the State's assumptions regarding economic feasibility:

- The likely scale of estimated fiscal need, which may be considerably greater than the State's current estimate of \$73 million per year.
- The State's ability to meet its funding commitment in the long-term, given other water-related funding needs and uncertainty regarding the true scale and sustainability of the funding pool.
- The ability of CWS to gain timely and ready access to such funds (especially smaller CWS, where the need typically is the greatest, yet the capacity to support grant applications and funding requirements are often the weakest).

Each of these concerns are addressed in turn, in the sections below.

Table 9. Estimated annual financial assistance needed for MCL compliance by system size category

System size (service connections)	CWSs impacted by MCL	CWSs w/PPI-HBI burden or on HR2W list	Assistance needed for PPI-HBI burdened and HR2W systems (\$M/yr)	Additional assistance needed for low-income households in non-burdened systems (\$M/yr)	Total annual assistance based on OWE/Raucher criteria (\$M/year)	Additional assistance needed for systems w/costs >\$30/SC ^a (\$M/year)	Total annual assistance needed (OWE/Raucher estimate + \$30 per SC) ^b
Fewer than 100	62	36	\$2.5	\$0.1	\$ 2.6	\$1.7	\$4.3
100 to 200	14	9	\$1.0	N/A	\$ 1.0	\$0.6	\$1.6
200 to 1,000	15	9	\$2.3	\$0.0	\$ 2.3	\$1.54	\$3.8
1,000 to 5,000	26	15	\$19.3	\$2.6	\$21.9	\$9.4	\$31.3
5,000 to 10,000	12	6	\$15.8	\$1.0	\$16.8	N/A	\$16.8
10,000 or more	31	12	\$52.5	\$13.0	\$ 65.5	N/A	\$65.5
Total	160	87	\$93.4	\$16.7	\$110.1	\$13.1	123.2

a. This estimate is net of assistance estimates in previous columns

Table 10. Comparison of State estimate of need (updated 7/31/2023) compared to project team estimate.

System size (service connections)	OWE/Raucher Estimate: Total annual assistance (\$M/year)	State Estimate: Total annual assistance (\$M/year)
Fewer than 100	\$ 2.59	\$ 4.4
100 to 200	\$ 0.99	\$ 1.7
200 to 1,000	\$ 2.34	\$ 3.9
1,000 to 5,000	\$21.9	\$ 30.0
5,000 to 10,000	\$16.8	\$ 14.0
10,000 or more	\$ 65.5	\$ 19.0
Total	\$110.1	\$ 73.0

5.1 Financial Need Estimate

There are three primary reasons why the State's estimated fiscal support needs of \$73 million per year is likely to be an underestimate:

1. SWRCB's estimate of the costs of compliance with the MCL may be considerably less than the actual expense many CWS will face. There are several reasons why this is likely to be the case. For example, the State's estimated costs of compliance for its 2014 proposed Cr VI MCL (also set at 10 ug/L) indicated that compliance costs for relatively small CWS would be considerably higher than the estimates provided in the current proposal. For example, for CWS serving less than 200 service connections (SC):
 - The State's 2014 rulemaking package estimated average compliance costs of \$5,630 per household per year (2013 dollars) (SWRCB 2013: ISOR, p 24, Table 8). Accounting for general inflation, the costs in 2023 dollars would be more than \$7,300 per household per year (based on the Consumer Price Index).
 - The 2023 ISOR and related supporting documents indicate average annual household costs of \$1,622 for systems with less than 100 SC; and \$808 annually per household in CWS of between 100 and 200 SC (2023 dollars) (SWRCB, 2023).

It is not clear how the State's estimated per household annual costs of compliance might drop by approximately 80% over the course of the intervening decade for systems in the smallest size category, and by nearly 90% for CWS in the 100 to 200 SC category. However, a key reason is likely the State's assumption that most CWSs will implement Reduction/Coagulation/Filtration (RCF) technology to treat Cr VI. There is significant concern among stakeholders that this assumption is not realistic because RCF technology is not appropriate for many systems (and is likely not appropriate at the level assumed by the State). Many affected CWSs will likely need to implement more expensive treatment technologies.⁹

In addition, some CWSs may be willing to consolidate with larger systems – a solution the State suggests as a recommended alternative for small systems. The costs of consolidation are not included in the State's estimates for MCL compliance.¹⁰

Finally, the State did not include costs associated with providing technical assistance to small or burdened systems to help them access needed funding and/or administering a program for disbursing funds. Given the amount of assistance needed, and the number of systems that would need to access funding, these costs could be significant.

2. Where compliance costs are greater than the State currently estimates, then there is a double whammy impacting the level of financial support needs:

⁹ The potential/ability for RCF to treat multiple contaminants (relative to more expensive treatment options) was also not extensively examined in the ISOR. To the extent alternative treatment technologies, such as reverse osmosis could treat a wider range of contaminants (i.e., that are likely to be regulated in the future), these processes, and the related affordability implications, should be examined in a comprehensive way.

¹⁰ While the State suggests consolidation as a compliance option, it is often not a viable or cost-saving solution; it can work in cases where physical proximity and water availability allow.

- Higher compliance costs means that more CWSs are likely to meet the State’s needs-based criteria for gaining access to funding support; and
- CWSs already identified as in need will likely face larger costs than initially estimated and, thus, need larger amounts of monetary support to comply with the MCL.

To assess the impact of increased costs on the overall need for assistance, the team evaluated the effect of 10% and 40% increase in treatment costs. With a 10% increase, the number of systems designated with a moderate-high, high, or very high HBI/PPI affordability burden increases from 87 to 90, with the additional three systems all serving less than 100 connections. In total, under this scenario, the estimated need for HBI/PPI burdened and HR2W systems would increase from \$93.4 million to \$103.0 million. The need for assistance for low-income households in non-burdened systems would also increase – from \$16.7 million to \$18.3 million. The total estimated need would increase by 10%, in line with the treatment cost increase. This is because the newly designated small systems account for a relatively small percentage of overall costs. This relationship holds for the 40% increase - the total number of systems with an affordability burden increases by six; however, all of these systems serve less than 100 connections. In this category, total need for assistance increases by 62%, while the overall need (for all systems) increases by 41%.

3. The level of need estimated using the State-applied criteria does not capture all the CWSs and households in need of fiscal support. For example, our estimate of fiscal support needs (as derived and described previously, in Section 4), amounts to \$110 million to \$123 million per year. This is 50% to 70% higher than the state estimate of \$73 million.

5.2 Long-Term Availability of State Funds

The total amount of State-administered funds that are available to support MCL compliance remains uncertain. Key questions include:

- Is the pool of available funding \$823 million (as claimed by the State), or some lesser (or greater) amount?
- Given prior commitments and the realities of periodic state and federal budget adjustments, how much funding for CWS compliance support is realistically anticipated for the coming decade and beyond?
- How many years can the fund support, and what happens if (when) the fund is no longer sufficient to meet needs?

There also are concerns regarding the many competing important water-related needs, prior commitments, and other demands for monies drawn from the pool of state-administered funds. Water systems across California face a daunting array of challenges and associated needs for fiscal and technical support. Among the many water supply issues competing for limited utility, state, and federal funds are infrastructure renewal, compliance with existing and anticipated new regulations (e.g., MCLs for PFAS), and water system resilience and supply reliability in the face of climate change, a likely reworking of Colorado River allocations, and seismic risks.

Further, beyond drinking water systems, there are many additional water-related funding needs and priorities ahead for the State. These include managing stormwater and flood risks, nutrient and other

wastewater discharge controls, fishery and ecosystem protection and restoration, infrastructure repair and construction, agricultural irrigation, and others.

The SWRCB points to “available state grants” as well as “DWSRF principal forgiveness” and “SADW funding for FY 2022-2023” as the sources of State funding that can readily support affordable and, thus, economically feasible compliance with the proposed MCL:

“... if financial assistance was needed for all systems with increased monthly household costs higher than \$30, any systems with a medium or high affordability burden, and any systems on the HR2W list, a total of \$73 million per year would cover all compliance costs for the 139,285 affected households (averaging \$526 per household per year). This value is less than 9% of the available state grant, DWSRF principal forgiveness, and SADW funding for the 2022-23 State Fiscal Year (\$823 million), indicating that this is not an unreasonable amount when considering financial assistance to treat hexavalent chromium ... there is the capacity to cover the costs for all of the identified troubled systems for whom compliance may be a challenge with less than 9% of the available state grant and DWSRF principal forgiveness funding...” (SWRCB 2023b).

For each of the three funding sources listed by the State, above, it will be helpful to examine:

- How much money each funding source has available, in total, for FY 2023-2024 disbursements, and how the sum of those three funding pools compares to \$823 million.
- The specific purposes for which each funding source may disburse funds (i.e., activities and needs that will compete with Cr VI compliance for source funding, or which may be otherwise restricted, e.g., CWS operation and maintenance needs).
- The amount (or percentage) of funding already obligated or planned for purposes other than fiscal support for Cr VI MCL compliance affordability.
- The firm commitments from the State and/or Federal government for funding levels for each of the three programs providing the money, for upcoming fiscal years (i.e., how far into the future can we be assured that these funding sources and funds be available?).
- How funds potentially provided by these sources may be front-loaded to assist with the upfront water system compliance expenses of planning and paying for compliance-driven capital improvements (e.g., installing treatment).

5.3 Opportunities and Barriers for Accessing Fiscal Support

The State’s commitment to provide meaningful financial support to ensure all Californians have access to safe drinking water is laudable. To make that goal into a reality, we need to consider the anticipated process and timeline for CWS applying for and ultimately receiving State funds, as well as the administrative burden placed on those systems and communities to apply for and receive State monies.

Timely compliance is a critical component of public health protection. Yet for small CWSs, CWSs with limited resources, and/or systems serving communities that are economically challenged (or where there are a relatively large proportion of economically challenged households), there typically are fiscal barriers to accessing necessary capital financing needed to plan, permit, install, and begin operating appropriate compliance-associated treatment.

Regardless of how much funding the State can access to support CWS and communities with affordability-related needs, it is imperative that the State’s administrative systems and associated procedures provide needed fiscal support in a timely, applicant-friendly, and sustained manner. For funding sources that the State may tap to support Cr VI and other MCL compliance for CWS for which affordability challenges meet the SWRCB’s criteria, it is critical that the following practical factors be anticipated and considered (especially for small CWS and their often-limited TMF capabilities):

- Submission requirements for applicants requesting fiscal assistance (including whether a potential requirement to first prepare and submit an assessment of potential consolidation opportunities, and obtaining a valid finding that such opportunities are not viable for the CWS)
- Personnel time, expertise, and expenses for a CWS to prepare, submit, and support a viable application for funds
- Contracted technical assistance to aid CWS in the application process, and State personnel to process and administer funding applications
- Timeline from submission to receipt of approval to receive fiscal support
- Terms and conditions for receipt of State funds by an approved CWS
- Timeline from State approval for funding, and receipt of funds by a CWS
- Ability (or lack thereof) to receive adequate funding for capital improvement planning and implementation (e.g., access to funds sufficient to cover initial capital outlays for compliance-related treatment)
- For systems not designated with an affordability burden, but which serve a disproportionate number of low-income households (as designated in this analysis), mechanisms will need to be established to provide assistance to these customers, whether by the state directly or through utility programs. This may include hard to reach customers (i.e., renters or customers who live in multi-family units that do not pay a bill directly).
- Need for technical assistance provided by the State to small CWSs and/or CWSs with financial capacity constraints.

6. Conclusions

The costs associated with California’s proposed MCL for Cr VI will impose economic hardship and affordability challenges for many households and the CWSs that serve them. The State has determined that \$73 million per year of state-provided fiscal assistance would be needed to offset these challenges.

The State’s estimate of need is in part based on affordability criteria and identification of challenged systems without consideration of Cr VI MCL compliance costs (i.e., systems designated as having a medium or high affordability burden per the State’s 2022 Needs Assessment). To account for systems that may face affordability challenges associated with compliance costs, the State also identified CWSs that would need to recover \$30 or more per service connection per month to comply with the MCL and indicated (per the ISOR) that it would cover compliance costs for these systems. However, the application of the \$30 threshold captures systems in some size categories that likely will not need financial assistance to cover the full cost of treatment. For example, many of the communities that meet this threshold have a much higher MHI and LQI than the state overall and a much lower prevalence of low-income households.

Setting aside the \$30 criteria, the application of additional affordability indicators (i.e., the HBI and PPI) yields a greater estimate of the number of systems within each system size category that would face financial hardship in complying with the MCL. In addition, our analysis captures many of the low-income households who would likely struggle to pay increased water bills but who are served by CWSs that are not designated with an affordability burden (and therefore would likely not receive a treatment cost subsidy). As a result, our estimate of need is significantly greater (ranging from \$110 million to \$123 million per year), compared to the State's estimate (\$73 million annually) of need for financial assistance. We recommend that the State adopt these metrics, which better reflect economic hardships for both households and water suppliers. We also recommend that the State compare the data used in its assessment to the data compiled by the project team – for example, it is not clear where the state obtained its data related to the amount that households currently pay for water and how this data compares to the Census data on this topic that the project team used for this assessment.

Our assessment is not intended to provide an exact estimate of need – for example, the State could provide different levels of assistance on a sliding scale (e.g., only cover a percentage of costs for systems with a moderate-high burden compared to those with a very high burden). However, the difference in the two assessments warrants further investigation. We believe that our approach provides a framework for better identifying both households and water systems facing affordability challenges, thereby ensuring public health protection through the provision of well-targeted public funding to both communities and households in need.

We agree with the State that providing public health protection through drinking water is a human right and all households within the state must be provided equal levels of protection in an affordable and economically feasible manner. We recognize that affordability and economic feasibility are complex concepts and even more challenging to address in an empirical manner. However, there is a real need for, and a State-promised commitment to provide, sufficient funding/fiscal support.

Critical issues will thus fall on whether the state-provided funding is sufficient, timely, readily accessible, well targeted, and sustainable. Key questions include:

- The methods and findings reported by the State as to level of funds needed, and for whom. In addition to the concerns articulated here regarding affordability-burdened systems and households, questions remain on the costs of compliance reported by the State and whether they accurately reflect the adoption of appropriate technologies and the likely level of costs CWSs will incur.
- The long-term availability and sustainability of sufficient State funds to ensure all current and future water service-related public health and safety, and critical environmental protection needs can be provided/supported.
- The ability of CWSs to gain timely and ready access to such funds (especially smaller CWSs, where the need typically is the greatest, yet the capacity to support grant applications and funding requirements often are weakest).

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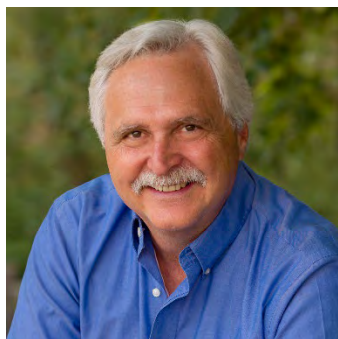
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Researcher Biographies



Janet Clements, President and Founder of One Water Econ, has 20 years of experience in water and natural resources economics, planning, and consulting. She conducts benefit-cost, triple-bottom line, and economic impact analyses of water-related policies and programs. Her areas of expertise include integrated water resource management, stormwater funding and financing, environmental markets, and affordability of water and wastewater services. She also works on climate vulnerability and adaptation planning and has extensive background in western water issues and demand management. Ms. Clements is active in the water sector; she

currently serves on EPA's Environmental Finance Advisory Board and has participated in several studies for national water sector organizations. Early in her career, Ms. Clements was a water and natural resources planner in a rural California county. She has a B.S. in Sustainable Resource Management from The Ohio State University and an M.S. in Agricultural and Natural Resource Economics from Colorado State University.



Robert Raucher, PhD (Raucher LLC) specializes in economics, affordability, risk management, and strategic planning for water supply, clean water, and recycled water agencies and research associations. Bob provides more than 40 years of experience in a diverse array of professional activities, including Triple Bottom Line (TBL) and related benefit-cost analyses, water supply planning and the evaluation of nontraditional portfolio options, affordability assessments and remedies, economic impact assessments (economic costs of water supply shortages), valuing water for supply reliability, water planning under climate change and related uncertainties, and developing business case evaluations for a broad range of water-related investments.

Dr. Raucher is an active member of the professional water supply, water reuse, and wastewater management community, serving on numerous expert panels and committees. He recently served as co-author of a report on potential U.S. federal low-income water customer assistance program design options and program evaluation. Bob has worked in numerous nations around the globe, and has served on three workgroups for the National Drinking Water Advisory Council in the United States. He was a principal author of the 2015 update of AWWA's M-50 Manual for Water Supply Planning.

Bob was the recipient of the 2016 Water Research Foundation *Pankaj Parekh Research Innovation Award* for lifetime achievements in applied water sector research. Dr. Raucher holds a PhD in natural resource economics and public finance, and an MS in econometrics, from the University of Wisconsin-Madison.

Trygve Madsen is an independent consultant and collaborator with One Water Econ. His areas of expertise include land and water use policy, recreation economics, and hazard mitigation. He brings research, science, and data to bear on crafting policies and building projects that support both people and the planet. Mr. Madsen excels in analytical writing and quantitative and qualitative research, including benefit-cost analysis, economic impact analysis, and program evaluation. His professional career includes five years as a researcher and analyst at the non-profit organization Earth Economics. Mr. Madsen has a Master of Public Administration and Environmental Policy from the University of Washington and a B.A. from Whitman College.