2023

DRINKING WATER
NEEDS ASSESSMENT
EXECUTIVE SUMMARY

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Full Report:
HTTPS://WWW.WATERBOARDS.CA.GOV/DRINKING_WATER/CERTLIC/DRINKINGWATER/DOCUMENTS/NEEDS/2023NEEDSASSESSMENT.PDF

APRIL 2023

Acknowledgements

Contributors

This report was prepared by the California State Water Resources Control Board (State Water Board) within the California Environmental Protection Agency (CalEPA). Contributing authors include:

Kristyn Abhold, William Allen, Andrew Altevogt, Matthew Basinger, Emily Houlihan, Mawj Khammas, David Leslie, Hee Kyung Lim, Karen Nishimoto, and Bansari Tailor.

Acknowledgments

We are grateful to UCLA Luskin Center for Innovation (UCLA), Corona Environmental Consulting (Corona), Sacramento State University Office of Water Programs, the Pacific Institute and the University of North Carolina Environmental Finance Center for their support in developing the foundational methodologies employed in the inaugural 2021 Needs Assessment.

We also thank Julia Ekstrom (California Department of Water Resources) and Komal Bangia, Laura August, John Faust, and Aaron Barrall (California Office of Environmental Health Hazards Assessment) for their support enhancing the Needs Assessment's methodologies and coordinating their agency's data sharing.

Additionally, we acknowledge the contributions and insights from comment letters the State Water Board received from a diverse group of stakeholders on a draft version of this report, as well as input received at public meetings and workshops held around the state on versions of this work.

CONTENTS

EXECUTIVE SUMMARY

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

In 2019, to advance the goals of the HR2W, California passed Senate Bill 200 (SB 200), which enabled the State Water Board to create the Safe and Affordable Funding for Equity and Resilience (SAFER) Drinking Water Program. SB 200 established a set of tools, funding sources, and regulatory authorities that the State Water Board harnesses through the SAFER Program to help struggling water systems sustainably and affordably provide safe drinking water. The SAFER Program is driven by collective responsibility: water systems, non-profit organizations, governments, a community advisory board, and other interested parties work together to develop and implement solutions.

Since the SAFER program began in 2019, 185 more water systems are providing safe and affordable drinking water, benefiting over 1.2 million Californians. As of April 2023, the State Water Board has distributed nearly $700 million in grants for drinking water projects, which is 95% more grant funding provided to water systems in disadvantaged communities than in the three years prior to the start of the program. In addition, 94 consolidations, serving 56,451 people, have now been completed through the program since July 2019.

The annual Drinking Water Needs Assessment (Needs Assessment), required to be carried out by the SAFER Program, provides foundational information and recommendations to guide this work.[2] The Needs Assessment is comprised of four core components: the Failing Water System List (Failing list), the Risk Assessment, the Cost Assessment, and the Affordability Assessment. Public input that the State Water Board received via workshops held in 2022 and February 2023 helped improve the 2023 Needs Assessment. The public feedback, all of which

[1] State Water Resources Control Board Resolution No. 2016-0010

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2016/rs2016_0010.pdf

[2] California Health and Safety Code section 116769 (b) states "The fund expenditure plan shall be based on data and analysis drawn from the drinking water needs assessment..."

is detailed in publicly available documents online, was incorporated into the final methodology and results as appropriate.

Three different water system types— public water systems, state small water systems and domestic wells— are analyzed within the 2023 Needs Assessment. Different methodologies were developed for these system types based on system type characteristics, as well as data availability and reliability.

Figure 1: Needs Assessment Components

The results of the annual Needs Assessment are used by the State Water Board and the SAFER Advisory Group[3] to inform the prioritization of available state funding and technical assistance within the Safe and Affordable Drinking Water Fund (SADWF) Fund Expenditure Plan (FEP).[4] The State Water Board typically hosts a series of workshops throughout the year to inform the FEP.

Figure 2: How the Needs Assessment is Utilized by the SAFER Program

[3] SAFER Advisory Group
https://www.waterboards.ca.gov/safer/advisory_group.html

[4] Safe and Affordable Drinking Water Fund
https://www.waterboards.ca.gov/water_issues/programs/grants_loans/sustainable_water_solutions/safer.html

The Needs Assessment is not a static analysis. The State Water Board annually updates the Needs Assessment, and it provides a valuable snapshot of the overall resources needed to bring failing systems into compliance with drinking water standards and prevent At-Risk water systems from failing. By incorporating this Needs Assessment into the SAFER Program and implementation of SADWF, the State Water Board will continue to lead long-term drinking water solutions. At the same time, this Needs Assessment gives clarity to the work that must collectively be done by state, federal, local and stakeholder partners. Only together can we be successful in achieving the Human Right to Water goal for all Californians.

2022 RETROSPECTIVE

FAILING WATER SYSTEMS

Since 2017, the State Water Board has been tracking community water systems and K-12 schools that meet the State Water Board's Failing criteria. The Failing criteria was expanded by the State Water Board in 2021 and may continue to evolve in the future. The evolving nature of the State Water Board's Failing criteria can make it challenging to analyze water systems on the Failing list over time. In 2022, there were 441 unique water systems on the Failing list at one point throughout the year as shown in Table 1. In 2022, there were 77 unique water systems that came onto the Failing list and 56 unique water systems were removed. 329 unique water systems remained on the list throughout the year.

Altogether, just over 1.2 million Californians were served by a failing water system at some point during 2022, but at any one time the number was far lower, fluctuating throughout the year as systems were removed or added to the Failing list. The Failing list from January 1, 2023, had 388 water systems, serving a population of approximately 938,000 people.

Table 1: Summary of Systems on the Failing List Throughout 2022

Water Systems	Number of Unique Systems	Total Population Served	Average Number of Service Connections	# of Systems on List Greater than 3-Yrs.
Small Water Systems[5]	353	318,209	249	195
Medium Water Systems[6]	23	893,557	9,868	11
K-12 Schools	65	17,905	6	45
TOTAL:	**441**	**1,229,671**	**715**	**251**

[5] 3,000 service connections or less.

[6] Greater than 3,000 service connections. No system with greater than 30,000 service connections has been on the Failing list since September 2019.

PROVIDING ASSISTANCE

The goal of the SAFER Program is to help Failing and At-Risk systems operate sustainably and achieve the HR2W. It does this by building local capacity through consolidations, administrators, technical assistance, and working with systems, the communities they serve and other partners to find long-term solutions to their specific problems. In doing so, the SAFER program utilizes a diverse set of funding programs and regulatory authorities to build water system capacity. The following summarizes the support provided to California water systems in 2022:

- 27 water systems, serving 7,663 residents were consolidated.
- The State Water Board's sent out over 3,000 letters to water systems recommending consolidation and hosted 12 Water Partnership Training events across the state.
- There are approximately 316 active consolidations either in early stages of development or in the funding process. There are an additional 56 potential consolidations in the early stages of engagement. Approximately 42% of water systems on the 2022 Failing list are considering consolidation or in full development of the consolidation alternative and progressing forward.
- Since 2020, the State Water Board has designated 16 public water systems in need of an administrator and held public meetings for all the impacted communities. This represents approximately 3,812 people and 1,140 service connections in 7 counties.
- Currently, there are 3 administrator projects with appointments and funding approved by the State Water Board. Eleven additional water systems have identified administrators and await executed funding agreements and/or are working through liability concerns before an administrator is ordered. The administrator process has just started for 2 water systems, for which an administrator is yet to be identified.
- The SAFER Program provided short-term solutions, such as emergency well repairs, and bottled and hauled water provision to nearly 24,000 individuals. Long-term solutions, such as construction and consolidation, were completed for 42 water systems, including nearly 8.5 million individuals. Planning assistance (towards construction of long-term solutions) was provided to 13 water systems, including over 33,000 individuals.
- The State Water Board provided $6,214,740 in planning and $751,823,022 in construction funding.
- In 2022, the State Water funded approximately $21,641,362 million for technical assistance to support 357 water systems.
- In 2022, the State Water Board and Local Primacy Agencies completed sanitary surveys for 900 community drinking water systems and 892 non-community drinking water systems. Identifying more than 30 significant deficiencies.

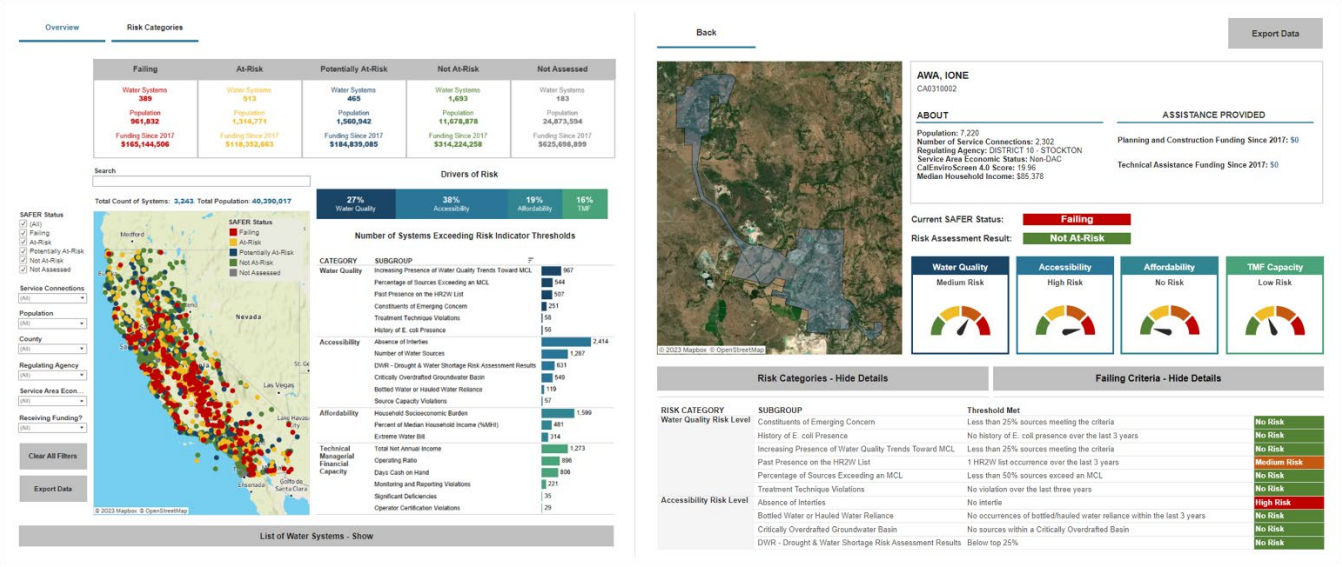
NEW TOOLS

In 2022, the State Water Board developed new publicly available Dashboards and datasets to improve access to the data and analysis contained in the Needs Assessment:

- **SAFER Dashboard (Failing and A-Risk Public Water Systems)**: https://bit.ly/3KhMZPB

- **Risk Assessment Results for State Small Water Systems & Domestic Wells Dashboard:** https://bit.ly/3nxWjGo
- **Water System Financial Capacity & Affordability Dashboard:** https://bit.ly/42C0xg7

Figure 3: SAFER Dashboard



ENHANCEMENTS TO THE 2023 NEEDS ASSESSMENT

AFFORDABILITY-RELATED ENHANCEMENTS

In response to stakeholder feedback after the release of the 2021 and 2022 Needs Assessments, the State Water Board in partnership with the Office of Environmental Health Hazard Assessment (OEHHA), hosted three public Affordability Workshops in 2022 to re-evaluate previously utilized affordability indicators, research new affordability indicators, and explore how to incorporate a new affordability indicator that measures disposable income limitations into the 2023 Needs Assessment and beyond.[7] These workshops also analyzed different approaches for determining DACs and establishing an "affordability threshold." Based on feedback from the public workshops, the State Water Board revised its affordability indicators as follows:

- The State Water Board removed two affordability indicators from the Affordability Assessment: 'Percent of Residential Arrearages' and 'Residential Arrearage Burden.'

[7] Workshop 1 (August 8, 2022); Presentation: https://bit.ly/3jsI4k8
Workshop 2 (September 20, 2022); Presentation: https://bit.ly/3juZwEI; White Paper: https://bit.ly/3HXrliS
Workshop 3 (November 1, 2022); Presentation: https://bit.ly/3CKoBIG; White Paper: https://bit.ly/3HVIsII

Current data for these risk indicators is not available for use in the Needs Assessment because it was collected once for the COVID-19 pandemic Drinking Water Arrearage Payment Program.[8] This data is currently not collected annually from community water systems.

- The State Water Board and OEHHA developed a new affordability indicator, incorporating stakeholder feedback from the three Affordability Workshops, "Household Socioeconomic Burden," a composite indicator that is a combined measure of Housing Burden and Poverty Prevalence that measures the extent to which low-income customers may have affordability challenges now or in the future because their disposable income is constrained by high housing costs. This allows for the first time, the inclusion of approximately 680 community water systems (i.e., mobile home parks. etc.) that do not charge customers directly for water in the assessment.[9]

ENHANCEMENTS TO THE RISK ASSESSMENT FOR STATE SMALL WATER SYSTEMS & DOMESTIC WELLS

The 2022 Risk Assessment included two categories: Water Quality and Water Shortage. In 2022, the State Water Board partnered with OEHHA to develop a third category of risk for state small water systems and domestic wells that analyzed socioeconomic risk. The purpose of the new Socioeconomic risk category is to (1) assess a counties' overall administrative, technical, and managerial capacity to assist communities served by state small water systems and domestic wells and (2) assess the ability of communities served by these systems to access and pay for water at a neighborhood level, especially when faced with a well experiencing water quality or water shortage issues.

A workshop was hosted in February 2023 to provide an opportunity for stakeholders to recommend how this new Socioeconomic risk category is combined with the Water Quality and Water Shortage risk categories to identify at-risk state small water systems and domestic well communities.[10]

2023 NEEDS ASSESSMENT RESULTS

RISK ASSESSMENT

The purpose of the Risk Assessment is to identify public water systems, state small water systems and regions where domestic wells are at-risk of failing to sustainably provide a

[8] California Water and Wastewater Arrearage Payment Program https://www.waterboards.ca.gov/arrearage_payment_program/

[9] Since 2020, all affordability indicators have relied on the water systems charging for water. In 2022, nearly 40% of DAC water systems were excluded from the Assessment because they do not charge for water (i.e., mobile home parks that include their water bill in rental charge).

[10] February 3, 2023 Needs Assessment Workshop: Proposed Changes for the 2023 Needs Assessment: White Paper: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2023prelimneedsassessment.pdf; Presentation: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/2023/2023-Preliminary-Needs-Assessment-Results-Webinar-Presentation.pdf

sufficient amount of safe and affordable drinking water. Approximately 71 new water systems are added to the Failing list each year.[11] The identification of At-Risk water systems and domestic wells allows the State Water Board to proactively target technical assistance and funding towards communities to prevent systems from failing to achieve the goals of the HR2W.

The State Water Board has developed two different Risk Assessment methodologies to identify At-Risk public water systems and communities served by state small water systems and domestic wells. Different methodologies were developed for these system types based on system type characteristics, as well as data availability and reliability.

The first methodology is for community water systems with up to 30,000 service connections or 100,000 population served and K-12 schools. The second methodology identifies state small water systems and domestic wells that are at a high risk of water shortage, accessing source water that may contain contaminants that exceed safe drinking water standards, and/or socioeconomic constraints in addressing challenges with accessing safe drinking water.

At-Risk Public Water Systems

In 2022, approximately 87% of systems that were on the Failing list were designed At-Risk or Potentially At-Risk in the 2022 Risk Assessment**.** The Risk Assessment continues to improve its ability to identify systems at-risk of failing.

The 2023 Risk Assessment was conducted for 3,053 public water systems and analyzes water system risk across four categories: Water Quality, Accessibility, Affordability, and TMF (technical, managerial, and financial) Capacity. On January 1, 2023 there were 381 water systems included in the analyses that were on the Failing list. The Risk Assessment results, after excluding Failing list systems,[12] are: 512 (17%) At-Risk water systems, 453 (15%) Potentially At-Risk water systems, and 1,707 (56%) Not At-Risk water systems (Figure 4).

Compared to the 2022 Risk Assessment results, the 2023 Assessment identifies 113 more At-Risk water systems (including Failing system performance in the Risk Assessment) and a statewide increase in total average risk scores. The increase in the number of At-Risk water systems and total average statewide risk scores is mostly attributed to the addition of the new Affordability Category risk indicator 'Household Socioeconomic Burden.'[13] Furthermore, 119 (4%) of At-Risk systems were automatically at-risk, regardless of their performance across all risk indicators because they have relied on bottled and/or hauled water to meet customer demand within the last three years. This is 30 more systems when compared to the 2022 Risk Assessment results, which had 89 (3%) of systems automatically At-Risk. Learn more about this in Appendix A.

[11] Average based on systems added to the Failing list between 01.01.2017 through 12.31.2022.

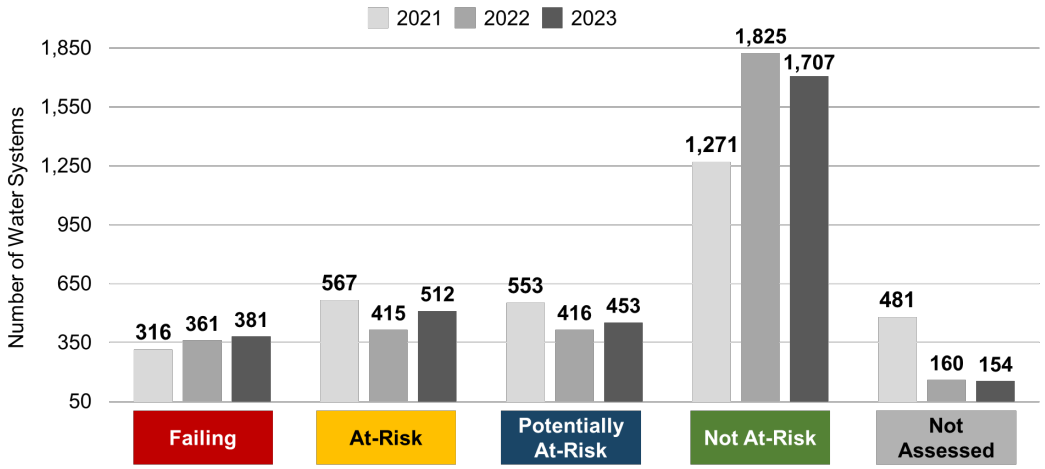
[12] Of the 381 Failing water systems, 302 (79%) meet the At-Risk threshold. If these systems come off the Failing list, they will be considered At-Risk systems.

[13] Comparing the 2023 Risk Assessment results to the 2022 results, 359 (12%) of water systems experienced no change in their performance, 1,648 (55%) systems accumulated more risk points, and 1,010 (33%) accumulated less risk points. The increase in the risk points in the 2023 Risk Assessment is attributed to the changes made to the Affordability category in the Risk Assessment. Learn more in Appendix A.

Since the State Water Board began identifying At-Risk water systems in the Risk Assessment in the 2021 Needs Assessment, the total number of unique At-Risk water systems has remained fairly constant. This is due to a number of factors, including expanding Failing criteria, improved risk indicators and data, and the expansion of the inventory of systems included in the Risk Assessment.

The results of the Risk Assessment and the current list of Failing water systems are accessible online through the State Water Board's SAFER Dashboard. The Dashboard updates the Failing list daily and the Risk Assessment results will be updated on a quarterly basis with new data as it becomes available. Learn more about the SAFER Dashboard in Appendix E.

Figure 4: Risk Assessment Results Since 2021[14, 15]



At-Risk State Small Water Systems & Domestic Wells

The Risk Assessment methodology developed for state small water systems and domestic wells is focused on identifying areas where groundwater is at high-risk of containing contaminants that exceed safe drinking water standards, is at high-risk of water shortage, and where there is high socioeconomic risk. Statewide, the top contaminants that contributed to higher risk designations in domestic wells and state small water systems are nitrate, arsenic, 1,2,3-trichloropropane, gross alpha, uranium, and hexavalent chromium. The analysis found high water shortage risk areas are highly correlated with reported dry wells. Of the dry well reports[16] made to the Department of Water Resources within the past year, 85% are located within an area with high water shortage risk. Table 2 shows the approximate counts of state

[14] Not Assessed includes: in 2021, wholesalers and community water systems with greater than 3,300 service connections; in 2022 and 2023, wholesalers and community water systems with greater than 30,000 service connections or 100,000 population served.

[15] In 2023, Not Assessed includes 86 large community water systems that serve greater than 30,000 service connections or 100,000 population served and 68 wholesalers.

[16] Households report well outages or issues to the Department of Water Resources https://mydrywatersupply.water.ca.gov/report/

small water systems and domestic wells statewide located in different risk areas based on data from the 2023 Risk Assessment.

Table 2: State Small Water System and Domestic Well Results (Statewide)

Assessment	At-Risk	Potentially At-Risk	Not At-Risk
State Small Water Systems	245 (19%)	620 (48%)	432 (33%)
Domestic Wells	81,588 (28%)	103,986 (36%)	105,827 (36%)

Proximity to a nearby community water system is important information for Counties and communities served by state small water systems and domestic wells in case of emergencies and potential codependences. For the first time, the State Water Board has included an analysis of this information:

- Approximately 14,675 domestic wells (18% at-risk domestic wells) and 81 state small water systems (33% of at-risk state small water systems) are located within the boundary of a community water system.
- Approximately 26,579 domestic wells and 99 state small water systems are located within one mile of a community water system boundary.

COST ASSESSMENT UPDATE

This 2023 Needs Assessment does not include an updated Cost Assessment. The State Water Board is currently updating the full Cost Assessment Model for Failing and At-Risk public water systems, state small water systems, and domestic wells for the 2024 Needs Assessment. This 2-year enhancement effort includes:

1. Updating how the Cost Assessment Model identifies and selects interim and long-term solutions for Failing and At-Risk systems.
2. Updating and enhancing the cost assumptions and formulas used in the Model to estimate costs – both capital and non-capital.
3. Improving the analysis of the Cost Assessment results.
4. Improving transparency by making the underlying data, formulas, etc. more accessible.

The State Water Board began hosting public workshops in 2022 to start soliciting public feedback on the proposed enhancements to the Cost Assessment.[17] Additional workshops are planned for 2023.

AFFORDABILITY ASSESSMENT

[17] August 8, 2022 Workshop: Proposed Changes for the Cost Assessment: White Paper: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/needs/cost-assessment-white-paper.pdf; Presentation: https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2022/2022-proposed-changes-to-cost-model-bt.pdf

The Affordability Assessment identifies community water systems that serve disadvantaged communities (DAC/SDAC) that must charge their customers' fees which exceed the affordability threshold established by the State Water Board to provide adequate safe drinking water. The 2023 Affordability indicators included are the same that are utilized in the Risk Assessment, which also includes indicators in three additional categories: water quality, accessibility, and TMF capacity. In the Affordability Assessment, Affordability indicators are analyzed independently from the other category indicators in the Risk Assessment:

- **Percent Median Household Income**: average residential customer charges for 6 hundred cubic feet (HCF) per month[18] that meet or exceed 1.5%[19] of the annual Median Household Income (MHI) within a water system's service area.
- **Extreme Water Bill**: customer charges that meet or exceed 150% and 200% of statewide average drinking water customer charges at the 6 HCF level.
- **Household Socioeconomic Burden**: measures the percent of households in a census tract that are both low income (making less than 80% of the Housing and Urban Development (HUD) Area Median Family Income) and severely burdened by housing costs (paying greater than 50% of their income to housing costs).

To assess which systems may be facing the greatest affordability burden, the State Water Board analyzed how many water systems exceeded thresholds for multiple affordability indicators. Affordability burden is ranked from low (only one affordability indicator threshold exceeded), medium, (two affordability indicator thresholds exceeded), or high (three affordability indicator thresholds exceeded).

For the 2023 Affordability Assessment, State Water Board staff analyzed 2,845 community water systems.[20] The majority were identified as having low affordability burden (45%) followed by a medium affordability burden (12%) and a high affordability burden (3%). Overall, there is a higher proportion of DAC/SDAC systems that have a high or medium affordability burden compared to non-DAC and missing DAC status systems.[21]

[18] 6 HCF indoor water usage per month is roughly equivalent to 50 gallons per person per day for a three-person household for 30 days. It is commonly used to estimate household consumption.

[19] 1.5% %MHI threshold is utilized by the State Water Board's Division of Financial Assistance to assess affordability and inform funding decisions for state funding programs.

[20] Compared to the Risk Assessment which analyzed 3,053 systems, the Affordability Assessment *excludes* non-transient, non-community schools and *includes* large community water systems (greater than 30,000 service connections or 100,000 population served).

[21] A water system (1) may not have enough U.S. Census data associated with its service area for the State Water Board to estimate its median household income to make a DAC/SDAC determination, or (2) may lack any useable geographic data to determine median household income with the current method utilized by the State Water Board.

Table 3: 2023 Affordability Assessment Results

Community Status	Total Systems Assessed	High Affordability Burden[22]	Medium Affordability Burden[23]	Low Affordability Burden[24]	None
DAC/SDAC	1,483	75 (5%)	246 (17%)	889 (60%)	272 (18%)
Non-DAC	1,347	19 (1%)	107 (8%)	394 (29%)	828 (61%)
Missing DAC Status	15	0 (0%)	1 (7%)	8 (53%)	6 (40%)
TOTAL:	**2,845**	**94 (3%)**	**354 (12%)**	**1,291 (45%)**	**1,106 (39%)**

DEMOGRAPHIC ANALYSIS OF NEEDS ASSESSMENT RESULTS

The State Water Board has compared the results of the Risk and Affordability Assessments to socio-economic data to better understand the communities most in need. The results of this analysis are summarized below:

- Communities served by Failing list systems on average experience 9% higher pollution burden, 3.2% greater linguistic isolation, and serve a 4.2% greater proportion of non-white households than systems non-Failing systems.
- Communities served by At-Risk public water systems on average experience 13% higher pollution burden, 4.6% greater linguistic isolation, and serve a 21.7% greater proportion of non-white households than systems not At-Risk.
- Communities served by At-Risk state small water systems and domestic wells on average experience 9.6% higher CalEnviroScreen 4.0 scores, 9.1% higher pollution burden, and serve a 3.9% greater proportion of non-white households than systems not At-Risk communities served by state small water systems and domestic wells.
- When compared with Non-DAC/SDAC public water systems, DAC/SDAC water system service areas tend to have 2.7% higher pollution burdens, 22% higher percentage of households in poverty, 4.9% higher percentage of limited English-speaking households, and are 8.2% likely to serve a greater proportion of non-white communities.

[22] Community water system met the minimum threshold for 3 of the affordability indicators.

[23] Community water system met the minimum threshold for 2 of the affordability indicators.

[24] Community water system met the minimum threshold for 1 of the affordability indicators.