Appendix K.

DWR Response to Summary of Public Comments and IRWUS Comment Letters

Prepared by

California Department of Water Resources

By

Submitting Agencies

California Department of Water Resources

Water Use Efficiency Branch

August 2021

DWR Response to Summary of Public Comments

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
1	Focus on efficiency rather than drought conservation. Efficient indoor residential water use devices are already near saturation because of active conservation efforts that involved significant investments over the past 30 years, which is why some water suppliers have low Ri-gpcds. Water suppliers are now further along the passive conservation curve, which yields less of a decline over time and projected declines in 2025 and 2030 Ri-gpcd through passive conservation are overestimated. Additionally, this recommended standard is supposed to be a long-term efficiency standard, not a drought conservation standard, but the recommended standard is based on water use from many service areas that have not rebounded from active drought conservation.	With projected effects of climate change on water resources coupled with growth and development, California is expected to experience more periods of limited supplies that will effectively define the new 'normal' condition. DWR acknowledges that active conservation by water suppliers during the previous 5-year drought could mean that they are 'further down the curve' of passive conservation and future declines will be lower. Detailed saturation and End-Use studies could better inform how much active and passive conservation is available, however these were not possible in the study mandated timeframe.
2	Passive conservation. Passive conservation was over-estimated because of low plumbing code enforcement.	This concern has been incorporated into the Report.
3	Drought hardening. Consider drought hardening and that water agencies have made major progress in indoor water use efficiency. Setting the standard at the 25th percentile without understanding the effect of accelerated water	The standards for future years are developed based on the estimated current indoor water use, regardless of normal or dry year conditions. Current average and median indoor residential water use indicate there is

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
	savings already achieved by suppliers through active conservation has likely resulted in an unreasonable statewide standard. Saturation rates for indoor measures indicate that there is limited opportunity for readily-obtainable, cost-effective increases in indoor water efficiency for much of the residential sector.	opportunity for indoor water use efficiency for many water suppliers. During drought other effective conservation measures (i.e., not irrigating or less frequently irrigating landscape) may have to be, and typically is, used to meet demand.
4	Flexibility. Water suppliers should be given flexibility and credit for water savings that have already been achieved. Water efficiency and supply reliability is better achieved through other means in many cases (e.g., outdoor use or conjunctive use); the recommendation will not allow for necessary flexibility.	The recommended standard reflects achievements of over 1/3 of retail water suppliers. Water suppliers retain flexibility in their approach to the standard: the overall water use objective is calculated by combining the indoor residential standard, the outdoor residential standard, the large landscape (for Commercial, Industrial and Institutional) standard, the water loss standard, variances, and a bonus incentive (as applicable). Water suppliers retain discretion for how they will meet their overall water use objective. This means that water suppliers may or may not need to or choose to implement strategies to reduce indoor water use.
5	Limited options. The low indoor residential recommended standard reduces options for agencies that are trying to effectively achieve water use efficiency through more cost-effective mechanisms. Water suppliers understand the need to focus on outdoor and water loss but need the flexibility of where to invest but going	See response to Comment Summary 4.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
	back to indoor use to do active work with diminishing returns seems counterproductive.	
6	Cost Effectiveness. There are concerns related to cost effectiveness, achievability, and affordability (which is not just for DACs), which further impacts human right to water. There may be reductions in sales, which will lead to less funds to invest in fixes to aqueducts and other important projects. Low flows may require operational changes or additional investments in infrastructure to ensure continued operation and eliminate threats to public health. Implementation of lower standards requires advanced cost and impact analysis prior to planning and building new infrastructure.	We recognize that the indoor residential standard cost and impact analysis will be site specific, therefore no cost and benefits analysis was conducted for IRWUS at the statewide level. DWR conducted an analysis of impacts and benefits and conducted interviews with selected impacted stakeholders and have developed the impacts and benefits to the water, wastewater and recycled water systems and have included the information in the report for the Legislature to consider. Additionally, the Water Board will conduct economic analysis before adopting long-term standards (including analysis of the impacts of the policies of the 2018 legislation on local wastewater management. See also response to Comment Summaries 4 and 24.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
7	Cost to Suppliers. Cost and cost-effectiveness must be quantified and considered in setting all water efficiency standards to inform recommendations and make better use of limited resources. Water agencies are resource constrained in balancing many State and local requirements. Expending time and money on meeting an indoor standard takes those resources away from other important water agency actions related to drought planning and climate adaptation. Because many of the water suppliers service areas are near saturation with efficient devices, they will need to implement more expensive options that are not cost-effective in order to meet the indoor residential standard. Remaining customers to be targeted for conservation would require expensive direct install programs, technical support, and human resources. Remaining indoor water use efficiency is most likely in multifamily residential and low-income areas, which is harder to target because of renters. Additionally, COVID utility debts have exacerbated revenue conditions for water utilities. Any funding programs should focus on agencies who have been lagging in active conservation so that they can be brought up to speed with indoor water use savings.	While no cost analysis is included in the Report, implementing the recommendations of the Report would benefit from State investment and technical assistance, helping approximately 400 water suppliers. A cost analysis will be conducted as part of the State Water Board's rule making process in adoption of all the other standards. Water suppliers retain the flexibility to implement programs aimed at reducing water use associated with any of the standards in order to meet their water use objectives (see response to Comment Summary 4). No State funding is being advanced as part of the recommendations, however, water conservation projects are eligible for State Revolving Fund as a part of construction/implementation projects.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
8	Customer Implementation. Water suppliers will have a difficult time achieving the recommended standards because water suppliers cannot compel customers to install devices or use water efficiently and water supplier offered incentives need to be cost-effective.	Half of suppliers are estimated to be on track to be at or below 44 gpcd for indoor residential water use by 2030 with passive conservation only. Estimates of water use are expected to be even lower with active conservation included. See also response to Comment Summary 4.
9	Cost to ratepayers. Suppliers and related agencies will have to pass through costs to ratepayers to address potential impacts and implement programs, but rate increases are difficult to achieve due to public perception and it may artificially put customers into higher rate tiers. Statewide messaging would be useful in supporting any necessary rate increases. The cost of water is already a significant challenge to affordability and the human right to water for all; water affordability has decreased by 46%. However, studies show long-term water conservation results in significant avoided costs for the water agencies and rate savings for their customers.	Water use efficiency is often less expensive than developing new water supplies and may help to ensure equitable and affordable access to water. Language has been added to the Report Recommendations section to incorporate the stakeholder comments that statewide messaging would be useful in achieving rate increases to implement any necessary programs. DWR will enhance its water conservation outreach in response to current drought.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
10	Low-income community impacts. Impact of new standard on low income/disadvantaged communities must be considered. This may disproportionately affect low-income communities because of access barriers to rebate programs, such as up-front costs or cost-share, and the cost for implementing these programs is passed down to customers. Legal interpretation of Prop 218 restrictions prevents some water suppliers from offering programs specifically for low-income customers. Additionally, a high percentage of low-income communities are renters making outreach a challenge. Financial assistance would help low-income communities and water suppliers serving low-income communities afford water efficiency programs and devices. Technical assistance would help low-income communities apply for and administer financial assistance programs.	Language has been incorporated into the Report Recommendations Section to acknowledge the need for financial assistance programs targeted to low-income communities.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
11	End Use Studies. DWR should defer a recommendation; the existing standards that are in the statutes will save water through 2030. After additional analysis, an indoor water use standard and implementation timeline can be recommended if warranted. For the recommended standard to reflect best practices, as required by Water Code, additional analysis is needed on the effects of varying levels of conservation or best practices and an End Use study or saturation study to determine how much conservation potential actually exists. Additional studies, especially for the Study lowest 25%, would better inform the recommended standard, obstacles and challenges water suppliers may face, and help to estimate holistic impacts on individual water suppliers related wastewater and recycled water agencies. End Use studies could also identify if outdoor water use was fully excluded in the analysis as well as understand how device efficiencies change over time. However, even if End Use studies are not used to inform the recommended standard, End Use studies would still be valuable to water suppliers in order to help them identify where inefficiencies remain for focusing their resources.	DWR is not deferring a recommendation or conducting additional studies. Detailed saturation and End-Use studies could better inform how much active and passive conservation is available, however these were not possible in the study mandated timeframe. Language has been incorporated into the Report Recommendation, Section 8, on the usefulness of End Use studies for assistance to water utilities in targeting resources.
12	Conservation and efficiency are the lowest-cost source of new supply.	Noted.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
13	Insufficient time to implement. There is not enough time between now and 2025 for budget and project planning and implementation to reduce water use. The 2025 recommended standard provides only a few years for nearly half of all systems to achieve significant water savings from the current 55 Ri-gpcd statutory set standard - this is not enough time between now and 2025 to budget, plan, and implement water use reductions to meet the recommended standard nor is there sufficient time for related water agencies (wastewater and recycled water) to budget, plan, and implement mitigation for reduced flows arising from the recommended standards. No change in the 2025 standard would allow time for DWR to strategize with stakeholders on a recommendation that accurately reflects reasonable conditions; a less aggressive 2025 standard would help water suppliers and related agencies by giving them more time to prepare for the lower 2030 standard.	No change in the 2020 indoor residential standard and with almost half the water suppliers already meeting the 2025 indoor residential standard means that water suppliers and related water utilities have time to plan, develop partnerships and programs, and support conservation as a way of life. See also response to Comment Summary 4.
14	Statewide Outreach. Statewide outreach and messaging would help water suppliers achieve the standards and explain changes in rate structures to provide for a higher likelihood of successful Proposition 218 elections.	This comment has been incorporated into the Report Recommendations Section.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
15	Overall WUO Impacts. DWR should take the time to obtain the data and conduct the required studies to effectively evaluate the impacts of modifying the indoor standard and consider all potential impacts on Suppliers' overall water use objective. In the interim, the legislation already provides a stepped down approach to the indoor water use standards and will result in greater savings than 20 by 2020.	The Department and the Water Board are considering the effect of the components that make up the urban water use objective as described in Section 10609.20 (a) of the Water Code on urban retail water suppliers. The Ri-gpcd recommendations are provided to the Legislature for their consideration to meet the requirements of 10609.4.(b)(1). The recommended standards will only be used in establishing the water use objective if the Legislation is enacted.
16	Transparency. There should be transparency with the progress on other objectives that are being established.	DWR conducted over 15 stakeholder meetings on the other components of the water use objective along with meetings and discussions with individual stakeholders. DWR has presented background information, studies, and potential options with stakeholders. Materials are posted to the stakeholder SharePoint site, available to all interested parties. DWR continues to solicit feedback from stakeholders in refining options and developing its recommendations to the Water Board for the water use objective and annual reporting.
17	Quantitative Analysis. A quantitative analysis on the impacts of a changed standard, including costs, should be conducted before DWR recommends a changed standard. The report identifies substantial qualitative impacts; time, money, and stranded assets are real constraints	There are numerous utility-system specific factors that must be considered for a quantitative analysis, which was beyond the scope of DWR's study in order to meet the mandated deadline. Additionally, at the time of analysis, recommended standards were not yet

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
	that must be given due weight in the recommendations.	identified and sufficient locally specific information for all 400 water suppliers and their associated wastewater and recycled water facilities was not available. See also response to Comment Summary 24.
18	Inherent System Design Issues. Water and wastewater systems are designed for maximum flows and utilities are already planning future investments to ensure system resilience for a changing climate, growing population, and aging infrastructure. Infrastructure and operations mitigation may be necessary to accommodate a lower indoor residential water use that could reduce flows below the minimum design capacities. Operations mitigation will require substantial resources and additional water to flush conveyance and storage systems to maintain operation and public health conditions. Infrastructure mitigation will require substantial revenue and time to implement and plan.	While there is no estimated cost for implementation of the recommended standards included with this Report, implementing the recommendations would require state investment and technical assistance for helping impacted water suppliers and wastewater utilities. See response to Comment Summaries 17 and 24.
19	Recycled Water. Reduced availability of recycled water due to future conservation must be included in any planning effort. Reducing the indoor residential standard impacts quality of recycled water and recycled water delivery to customers. Many new recycled water projects are already in various states of planning and implementation throughout the state, including large scale potable reuse projects. Recycled	See response to Comment Summary 6.

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
	water conveyance assets paid for by grants and ratepayers would be stranded, which could also lead to reduced investment of limited resources in expanding recycled water, a sustainable local water supply, because of higher treatment costs and associated risk.	
20	Missed Impacts. The Study did not address potential impacts of reduced recycled water on environmental flows and legal delivery obligations that would have to be met with potable water. Many situations and agreements also require sending water to other suppliers for agricultural use and for canal flows.	DWR recognizes that reduced recycled water availability for environmental flows or contract obligations are potential adverse impacts that were not addressed in the benefits and impacts analysis.
21	Missed Benefits. DWR's study missed some benefits and co-benefits of water use efficiency including, but not limited to: benefits to customers, ecosystems, and reduced water supplier energy use associated with greenhouse gas reductions.	DWR's benefits and impacts analysis scope was conducted in accordance with the Water Code directive.
22	Net Water Supply Benefit. A net water supply benefit analysis needs to be conducted. Water saved by conservation may reduce the amount of available recycled water. Demands will simply shift from recycled water to other more expensive supplies: water agencies that use a combination of recycled and potable water are concerned that the new standards may result in increased potable demand because other more costly supplies would need to be purchased to	DWR's qualitative benefits and impacts analysis identified potential adverse impacts associated with declining flows. There are numerous utility-system specific factors that must be considered for a quantitative analysis, which was beyond the scope of DWR's study in order to meet the mandated deadline. Additionally, at the time of analysis, recommended standards were not yet identified and locally specific information for all 400 water suppliers

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
	supplement shortfalls or potable water would be needed to meet delivery obligations for non-potable uses.	and their associated wastewater and recycled water facilities was not available.
23	Supply reliability. Recycled water is identified in the CA Water Resilience Portfolio as a reliable, drought resistant water supply. There may be significant impacts to agencies that are deeply interconnected and have made investments to maximize the future use of Recycled Water-Groundwater Systems to improve water service reliability. Agencies are planning for shifts in supply reliability due to climate change and providing reliable access to safe and affordable water. One of these strategies is also expanded recycled water use.	See response to Comment Summary 4.
24	Wastewater Costs. The true cost to wastewater treatment facilities to adapt to conservation should be studied in detail, including direct and indirect impacts on the utilities and ratepayers, and considered with all other impacts of the recommended standards. Unintended consequences of conservation for the wastewater collection systems and the operation have accelerated in the past two decades as conservation efforts intensified. Wastewater systems were not designed to handle a wide range of flows creating significant operational and maintenance challenges (several costs and impacts identified).	No comprehensive statewide analysis of impacts and benefits was feasible for every system. However, DWR conducted a qualitative evaluation and identified potential benefits and impacts to water and wastewater systems and recycled water use. While a quantitative analysis of impacts of the recommended standards was not possible, the Water Board is conducting an economic impacts analysis in adopting the long-term standards to evaluate the effects of the 2018 legislation policies on local wastewater management. Their analysis will include impacts associated with all standards including the existing and

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
		recommended standards. The study will be made available for public review during the Water Board rulemaking process.
25	Water Supply Impacts. Water quality in the potable water from water aging in tanks and reservoirs within the system is a major concern. Tanks still need to be filled for fire flows, but less would be used for potable water supplies resulting in stagnant water and water quality health concerns in the supply system. Downsizing tanks would be extremely expensive and additional flushing needed to maintain potable water quality requires more potable water.	DWR's benefits and impacts analysis acknowledged the potential adverse impact of stagnation on water supply systems.
26	COVID 19 Effects. The global pandemic has resulted in a shift in daily water consumption from the commercial, industrial, and institutional sector to the residential sector. Some suppliers have observed increased water production in winter indicating COVID-19 impacts that may stay and be permanent. It is unknown how extensive effects will be, but it could be a significant increase in indoor residential water use that is not a function of reduced efficiency. These impacts need to be better understood and quantified and inform the standards for indoor residential use.	DWR's study included results showing that indoor residential water use increased about 3 to 5 gpcd during the pandemic 'stay at home' mandates. The report acknowledged that little is known about how persistent this may be and effects will be variable depending on the nature of the community. However, recent data indicate that, on average, the long-term effect may be minimal ("Interactive Household Water Use Data: Q2 2020 -Q2 2021", https://index.flumewater.com/).

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
27	Stakeholder Engagement. Collaboration required by the Water Code has not been made available to stakeholders; the proposed draft standards were presented before stakeholder collaboration occurred. Stakeholders did not have an opportunity to review the results of the indoor water use studies and provide meaningful input to inform the draft standard prior to its release. Collaboration with stakeholders involves DWR and the stakeholders engaging in meaningful dialogue, providing input and feedback, and jointly working through issues. However, while concerns have been raised from water agencies that there has not been sufficient discussion about these impacts, water utilities have had far more opportunity for input at this point than members of the public.	The Water Use Studies Working Group was formed by the Department in July 2019 and comprised of water suppliers, non-governmental organizations, and State and local agency personnel. Three meetings were held with this 33-member Working Group to present and solicit stakeholder feedback on the study approach, study results, and the Department and Water Board joint recommendations. Stakeholder meetings were open to the public with attendance typically over 180 participants. Additional public outreach and engagement was accomplished through meetings requested by individual stakeholders. The indoor residential water use study team also received feedback from the 18 suppliers that participated in the study and were selected to provide data and collaborate with the Department on the study. A Draft Report was subject to public review for 25 calendar days, beginning on May 11, 2021 and ending on June 4, 2021. Public comments were posted on the Department's SharePoint site and were accessible by all interested parties. The Department and Water Board reviewed the written public comments and decided to hold a second public meeting on July 19, 2021 where additional public comments

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
		were received and considered in finalizing the Report.
28	Population. Accurate populations are necessary because the standard is population based, particularly for the lowest 25% because the standards are based on the projected 2030 median and current 2020 lowest 25%. Waiting for the 2020 Census data would provide more accurate counts than extrapolated numbers. Additionally, seasonal populations could skew results, changes in land use allowances could mean more people are served by one meter, and population is shifting with the ratio of people over sixty-five years old increasing. More retired people in the population overall suggests greater indoor water use going forward that should be considered in the standard.	DWR acknowledges that population is an important component of Ri-gpcd. DWR's Study populations are based on the American Community Survey (ACS) and Department of Finance (DOF)) population counts for Census tracts and number of people per meter. DWR acknowledged in the report that 2020 Census data would be preferred but were not yet available. However, the 2020 Census may have been affected by the pandemic conditions. Because of this unknown effect, ACS and DOF populations are suitable for use with the pre-pandemic 2017 through 2019 water use data. Effects of certain other factors on population in some service areas is expected to be balanced out by the opposite effect in other service areas.
29	Data Uncertainty. Data errors for the Distribution analysis mean that 'efficient water use' cannot be identified: the source data (eAR) may have errors resulting in overall errors in the analysis, margins of error could not be calculated, and customers in some service areas have multiple sources of water (e.g., private groundwater, water supplies from another water supplier), resulting in misrepresentation of service area Ri-gpcds.	Data used in the distribution analysis were extensively checked and results from the customer-level data analysis and the supplier-level (eAR) data analysis were in very close agreement. DWR acknowledges that there still may be minor errors in the data set and therefore in the results, however, any remaining overestimation errors in the distribution analysis are expected to be offset by underestimation errors. The potential for

No.	Indoor Residential Water Use Study Public Comment Summary	DWR Response to Public Comment
		multiple sources of water supplies to materially affect study results is low because of the Study quality control features. Most service areas will not have a significant amount of multiple water sources.
30	Support for the recommended standards. NGOs expressed support for the joint recommended indoor residential water use efficiency standards.	Support for the recommended standards noted.

List of Submitting Agencies

Association California Water Agencies (ACWA)

California Association of Sanitation Agencies (CASA), Central Valley Clean Water Association(CVCWA), California Water Environment Association(CWEA), Southern California Alliance of Publicly Owned Treatment Works (SCAP)

California Water Efficiency Partnership (CalWEP)

Community Water Center, Los Angeles Alliance for a New Economy (laane), Clean Water Action, SPUR

Community Water System Alliance (CWSA)

Cucamonga Valley Water District (CVWD)

East Bay Municipal Utility District (EBMUD)

Eastern Municipal Water District (EMWD)

Inland Empire Utilities Agency (IEUA)

Irvine Ranch Water District (IRWD)

Los Angeles County Sanitation District

Metropolitan Water District

Municipal Water District of Orange County (MWDOC)

Mono Lake Committee, Natural Resources Defense Council (NRDC), Pacific Institute

Olivenhain Municipal Water District

Orange County Sanitation District (OCSAN)

Orange County Water District (OCWD)

Regional Water Authority (RWA)

San Diego County Water Authority (SDCWA)

Santa Lucia Preserve

Santa Margarita Water District (SMWD)

Santa Rosa, City of

June 4, 2021

WUEStandards@water.ca.gov

Water Use Efficiency Branch
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 95814

Re: IRWUS REPORT COMMENT LETTER

Dear Water Use Efficiency Branch,

The Association of California Water Agencies (ACWA), California Municipal Utilities Association (CMUA), California Water Association (CWA) and the undersigned agencies appreciate the opportunity to provide comments to the California Department of Water Resources (DWR) on the *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study* (draft Report). ACWA represents over 460 public water agencies that deliver approximately 90 percent of the water used for residential, commercial and agricultural purposes in California. CMUA represents over 50 water agencies that deliver water to nearly 75 percent of Californians. CWA represents water agencies that provide drinking water to just over 15 percent of the State and are subject to the jurisdiction of the California Public Utilities Commission. The Water Code recognizes that our members, local urban retail water suppliers,

have the responsibility of meeting the urban water use objective which is comprised of the standard-based water use targets.

We recognize that DWR, in coordination with the State Water Resources Control Board (State Water Board), had a statutory deadline of January 1, 2021 to conduct necessary studies and investigations on indoor water use and **may** jointly recommend to the Legislature a standard for indoor residential water use (standard). However, we have significant concerns that DWR's current path has not complied with the statutory requirements of Water Code Section 10609.4 to:

1) collaborate with, and include input from, water and wastewater agencies on the studies, investigations and the ultimate report; and
2) analyze the impacts on water and wastewater management of changing the standard for indoor residential water use.

It is important that these statutory requirements are met in a meaningful way before DWR moves forward with jointly recommending standards for indoor water use. We propose that DWR:

1) withdraw the joint recommendation for the indoor residential water use standard (recommended standard) included in the *draft Report; and*
2) work collaboratively with stakeholders – including water, wastewater and recycled water agencies – over the next six to nine months to analyze and quantify the impacts of a changed standard. This analysis should help inform the basis for DWR and the State Water Board's revised recommendation to the Legislature, if there is one.

DWR's draft recommended standard would first effectuate a change in the standard in 2025 (following the enactment of authorizing legislation). Consequently, **our recommendation would have no impact on expected water savings in the interim, could avoid unnecessary adverse impacts to water and wastewater management and would allow DWR to meet the statutory requirements to collaborate and analyze the impacts on water management.** Additionally, we note that while the statutory requirement for DWR to conduct studies and investigations by January 1, 2021 is mandatory and has been missed, the requirement for DWR to develop a joint standard is permissive discretionary.

Absent a collaborative stakeholder process and adequate analysis that supports a recommended change in the standard, the indoor water use efficiency standard should remain at the current statutorily set standards of 55 gallons per capita daily (gpcd) until 2025, 52.5 gpcd until 2030 and 50 gpcd after 2030.

Specific Issues of Concern with the Draft Report, Recommendations and Process

We would like to work with DWR to address the following concerns:

1. REQUIREMENT TO COLLABORATE WITH WATER, WASTEWATER AND RECYCLED WATER AGENCIES

DWR's current efforts would not meet the legislative requirements to collaborate with, and include input from, water and wastewater agencies. AB 1668 requires:

> *The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to,*

environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.[1]

We appreciate that DWR held a day-long workshop on May 21 in response to concerns raised regarding collaboration with stakeholders. However, proposed draft standards were presented before stakeholder collaboration occurred. Stakeholders did not have an opportunity to review the results of the indoor water use studies and provide meaningful input to inform the draft standard prior to its release. Additionally, it is our understanding that participants in the water use studies have had mixed results in providing clarifications or updating the data ultimately used for the draft recommended standard.

Collaboration with stakeholders involves DWR and the stakeholders engaging in meaningful dialogue, providing input and feedback, and jointly working through issues. We are ready to work collaboratively with DWR and the State Water Board.

2. REQUIREMENT TO ANALYZE IMPACTS OF A CHANGED INDOOR STANDARD

DWR's current efforts would not meet the legislative requirement to analyze the impacts of changing a standard. AB 1668 requires:

The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.[2]

DWR's draft Report indicates that "a quantitative analysis is beyond the scope of this study." Given the significant reductions in indoor residential water use that DWR is proposing, this is not acceptable. The draft recommendations could create significant adverse impacts on water and wastewater management. The legislative requirement was intended to ensure that adverse impacts are understood in order to inform DWR's recommendation, if there is one. **Before DWR moves forward with recommending a changed standard, it must conduct meaningful, quantitative analysis on the impacts of a changed standard.**

We have significant concern with DWR's conclusion that adverse impacts, such as stranded assets and water quality impacts, can simply be overcome with an undefined amount of time and money. Time and money are real constraints that must be given due weight in the recommendations. Further, expending time and money on meeting an indoor standard that is not based on sound data and analysis takes those resources away from other important water agency actions related to climate change, adaptation, affordability, compliance with water quality objectives, etc.

Additionally, these adverse impacts of a lowering of the indoor standard could impede the achievement of the State's other water goals – e.g., increase recycled water to 2.5 million acre-feet a year by 2030 and reduced reliance on the Delta – which should be considered as well.

DWR should analyze the impacts outlined below. Where impacts are unavoidable, the State should partner with water, wastewater and water recycling agencies to mitigate those impacts.

---

[1] *Water Code Section 10609.4 (b)(2)*
[2] *Water Code Section 10609.4 (b)(1)*

A. OPERATIONAL IMPACTS

Water and wastewater systems are designed, constructed and operated for a minimum level of flow. These systems require years, if not decades, of planning and millions of dollars of ratepayer investment to safely, reliably and affordably deliver and treat water for California's communities, economy, and ecosystems. California's water and wastewater agencies are planning now for future investments that will ensure water resilience with a changing climate, growing population and aging infrastructure. DWR noted that the draft standard can impose adverse impacts to water and wastewater management. **Given the significance of these adverse impacts, DWR should analyze various standards to understand how adverse impacts can be minimized while achieving water savings.**

I. *ADVERSE IMPACTS IDENTIFIED* – DWR has identified that the draft standard would result in nine adverse impacts. We recognize that a quantitative analysis is difficult to conduct due to the statewide variability of systems. However, a reasonable analysis – e.g., regional assessments, case studies, building on existing studies – can and should be completed over the next year to better inform a final standard. We note that DWR is proposing no change in the standard from the current default until 2025. This recommendation could be implemented without impacting water savings and could minimize adverse impacts.

II. *ADDITIONAL IMPACTS NOT IDENTIFIED: ENVIRONMENTAL FLOWS* – DWR should recognize the potential adverse impact of reduced environmental flows associated with decreased discharges from recycled water and wastewater treatment facilities. DWR did not recognize this as an adverse impact that could negatively impact other beneficial uses of water and any regulatory/permit conditions of those discharges.

B. COST IMPACTS

Climate change impacts – which include reduced snowpack, warming temperatures, shorter and more intense precipitation events and sea level rise – require water agencies to actively plan for shifts in precipitation, runoff and extreme events to meet the State's water needs. In addition to needed investments due to aging infrastructure and a growing population, water agencies are balancing the State's goal of achieving reliable access to safe and affordable water. We are concerned that DWR has not adequately analyzed the costs of its draft recommended standard to inform a cost-effective recommendation. We urge DWR to conduct a reasonable cost-effectiveness analysis to better understand the following impacts and inform its recommendation:

I. *COSTS OF ACHIEVING THE DRAFT STANDARD* – The draft Report indicates that "water use efficiency is often less expensive than developing new water supplies and may help ensure equitable and affordable access to water." Additionally, it anticipates that many agencies will be able to achieve the draft recommendation through passive savings, and that passive savings would account for a 0.5 gpcd per year. We have significant concern that DWR is overestimating the passive savings and therefore underestimating the need for active savings and the associated cost to meet the draft recommended standard.

The bulk of passive savings have already been captured in water agencies' baseline indoor water use levels. In California today, it is estimated that approximately 80 percent of all toilets are already efficient. Water agencies in California have invested more than $285 million in toilet rebates and incentives replacing nearly 4 million toilets. Homeowners have replaced another 12 million toilets irrespective of water agency rebates.[3] Because of the significant adoption of water efficient indoor devices, many water suppliers have shifted to outdoor water use efficiency efforts in order to maximize the cost-benefit. Additionally, because water agencies have been implementing robust indoor water use efficiency programs for decades, most of the cost-effective replacements have already been made. Water agencies will need to shift to more expensive options that are not cost-effective.

II. *COST OF ADVERSE IMPACTS* – The draft Report identified nine adverse impacts and adaptation strategies. According to the report, "any of the adaptation strategies cited do require increased investment from utilities," or would result in increased cost or higher costs than originally planned or budgeted. Additional analysis is needed to quantify costs and cost-effectiveness, as well as resources necessary to mitigate those impacts.

C. ***FEASIBILITY***

We have concerns that the feasibility considerations outlined below were not considered in DWR's draft Report. We urge DWR to consider these factors.

i. *TIMELINE: 47 GPCD BY 2025* – The draft Report proposed a recommended standard of 47 gpcd by 2025. 46 percent of suppliers are currently above that draft recommended standard. While recognizing that the draft standard is not self-implementing and would require legislation to go into effect, this new standard provides only a few years for nearly half of all systems to achieve significant water savings from the current 55 gpcd statutory set standard. Many agencies do not believe this is enough time to meet the draft recommended standard.

ii. *SATURATION AND DIMINISHING RETURNS* – As mentioned in the above section, *Cost of Achieving the Draft Standard*, indoor water use rebates have been part of suppliers' water efficiency programs for decades. One primary driver for these rebates was to accelerate the replacement of older, higher use fixtures like toilets beyond the natural replacement rate with high efficiency models as outlined in the national Energy Policy Act of 1994 and California's Title 20 (2015). Nearly three decades later, both rebates (active savings) and natural replacement (passive savings) have drastically shifted the indoor fixture inventory in homes and businesses toward efficient models. In fact, many suppliers no longer offer indoor rebates due to declining interest from customers and ample efficient fixture saturation in their service area. For example, the Regional Water Authority experienced a 57 percent decrease in indoor rebate applications over the last 10 years even though more funding was available. Current residential indoor

[3] A Saturation Study of Non-Efficient Water Closets in Key States. Alliance for Water Efficiency and Plumbing Manufacturers International. April 2017.

water use represents decades of steady improvements in indoor water use efficiency, limiting the potential for additional savings.

While there are still older fixtures in use in varying amounts throughout the state, the reduced savings potential will come at a much higher cost. The remaining older fixtures are most likely in multifamily (renters) and low-income households. This population is not likely to respond to rebate programs in which upfront customer money is required. In order to capture indoor water savings in these households, suppliers would need to implement a (no customer cost) direct install program in which both the fixture and installation are provided. Direct installation programs typically cost 3-5 times more than rebates per fixture but achieve the same per fixture water savings. In addition, it would require significant additional outreach to get participation from this remaining group.

D. ***AFFORDABILITY AND IMPACTS TO DISADVANTAGED COMMUNITIES***

The Water Resilience Portfolio recognizes the need to fulfill the Human Right to Water – that every human being has the right to safe, clean, affordable and accessible water adequate for human consumption, cooking and sanitary purposes. The draft Report acknowledges that the studies did not analyze affordability and impacts to disadvantaged communities. Due to cost impacts and the potential to impact rates, as well as the burden the standards will place on multi-family and low-income households to install more efficient devices, we recommend that DWR consider both the impacts and necessary resources to mitigate those impacts on low-income households and disadvantaged communities.

E. OTHER CONSIDERATIONS

i. *POPULATION DATA* – Residential indoor water use estimations are highly dependent on population. However, 2020 U.S. census data was not available and so DWR calculated the population for the distribution analysis from persons per household DOF or ACS data and ACS tract data for the baseline analysis. We recommend that DWR update the studies to include 2020 U.S. census data that is now available. We note that DWR is proposing no change to the standard from the current default until 2025 and so this would not impact water savings and would provide a more accurate RI-gpcd.

ii. *INCREASED PERMANENT TELECOMMUTING* – DWR should take account that many millions of Californians may not return to a regular in-office work schedule, resulting in a permanent increase in residential indoor water use not reflected in the draft standard. Currently it does not analyze this shift. In a recent study by Intermedia, 57 percent of small and medium size businesses plan to offer remote work plans to employees. California's Little Hoover Commission is also examining the potential for a permanent shift to remote work. The draft Report indicates that the "models detect a strong, significant effect of the percentage of over 65 population on Rigpcd. For every 10 % increase in the over 65 population proportion, Rigpcd increases by 3-5 gpcd." Since "the population over 65 is expected to capture situations where customers are home during the day," we would expect that any increase in telecommuting would have the same effect. We note that DWR is proposing no change to the standard from

the current default until 2025 and so including telecommuting data would not impact water savings and would provide a more accurate RI-gpcd.

3. CONSIDERATION WITHIN MAKING CONSERVATION A CALIFORNIA WAY OF LIFE

We urge DWR to ensure that the final standard meets the intent of *Making Water Conservation a California Way of Life.* The design of the urban water use objective was intended to provide flexibility to urban retail water suppliers implementing water use efficiency measures.

> *Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.*[4]

We have significant concern that the recommendation for a 42 gallon per capita day indoor standard – the 25th percentile of the current 2020 baseline – is not a reasonable efficiency standard and will undermine the intent of *Making Water Conservation a California Way of Life*, which was to allow agencies to cost-effectively and flexibly implement water use efficiency.

Water agencies are at the forefront of preparing for and managing the impacts of climate change, including longer and more intense droughts. As many of California's regions enter a second consecutive dry year and drought, much has been learned and improved on following California's historic 2012 – 2016 drought. Additionally, many agencies' demand has not fully returned to pre-drought levels indicating prolonged reduced use. Water agencies continue to make significant progress to reliably meet the water needs of California's communities, economy and the environment.

We appreciate your consideration of these recommendations and are committed to collaborating with DWR and the State Water Board to successfully implement *Making Water Conservation a California Way of Life.* To discuss these comments, please contact Chelsea Haines at chelseah@acwa.com.

Sincerely,

Chelsea Haines
Regulatory Relations Manager
Association of California Water Agencies

Sue Mosburg
Executive Director
California-Nevada Section AWWA

Andrea Abergel
Senior Regulatory Advocate
California Municipal Utilities Association

James Peifer
Executive Director
Regional Water Authority

Jennifer Capitolo
Executive Director
California Water Association

Charley Wilson
Executive Director & CEO
Southern California Water Coalition

[4] Water Code Section 10609(c)(1)

Rick Gilmore
General Manager
Byron Bethany Irrigation District

Anthony Goff
General Manager
Calleguas Municipal Water District

Tom Moody
General Manager
City of Corona Department of Water and Power

William Wong
Director of Utilities Department
City of Modesto

Krista Bernasconi
Mayor
City of Roseville

William O. Busath
Director of Utilities
City of Sacramento – Department of Utilities

Diana Langley
Public Works Director
City of Yuba City

Katie Evans
Director of Communications and Conservation
Coachella Valley Water District

Steve Welch
General Manager
Contra Costa Water District

John Bosler
General Manager/CEO
Cucamonga Valley Water District

Mark S. Krause
General Manager-Chief Engineer
Desert Water Agency

John Mura
General Manager/CEO
East Valley Water District

Joe Mouawad, P.E.
General Manager
Eastern Municipal Water District

Jim Abercrombie
General Manager
El Dorado Irrigation District

Greg Thomas
General Manager
Elsinore Valley Municipal Water District

Bruce Kamilos
General Manager
Florin Resource Conservation District/Elk Grove Water District

Carlos Lugo
General Manager
Helix Water District

Donald M. Zdeba
General Manager
Indian Wells Valley Water District

Shivaji Deshmukh, P.E.
General Manager
Inland Empire Utilities Agency

Paul A. Cook
General Manager
Irvine Ranch Water District

David W. Pedersen, P.E.
General Manager
Las Virgenes Municipal Water District

Paul E. Shoenberger, P.E.
General Manager
Mesa Water District

Bill Schwandt
General Manager
Modesto Irrigation District

Nicholas Schneider
Senior Legislation and Conservation Manager
Mojave Water Agency

Justin Scott-Coe
General Manager
Monte Vista Water District

Robert J. Hunter
General Manager
Municipal Water District of Orange County

Alicia Dunkin
Legislative Affairs Liaison
Orange County Water District

Allen Carlisle
CEO/General Manager
Padre Dam Municipal Water District

Robert Grantham
General Manager
Rancho California Water District

Kelley Gage
Director of Water Resources
San Diego County Water Authority

Paul Helliker
General Manager
San Juan Water District

Jennifer Burke
Director
Santa Rosa Water

Sean Barclay
General Manager
Tahoe City Public Utility District

Donald Chadd, President
Board of Directors
Trabuco Canyon Water District

Gary Arant
General Manager
Valley Center Municipal Water District

Matt Fulner
General Manager
Valley of the Moon Water District

Craig Miller
General Manager
Western Municipal Water District

Phil Hawkins
President
Yorba Linda Water District

June 4, 2021

Karla Nemeth
California Department of Water Resources (DWR)
1416 9th Street, Room 111-1
Sacramento, CA 95814

SUBJECT: IRWUS Draft Report Comment Letter

Dear Ms. Nemeth,

On behalf of the California Association of Sanitation Agencies (CASA), Central Valley Clean Water Agencies (CVCWA), California Water Environment Association (CWEA) and Southern California Alliance of Publicly Owned Treatment Works (SCAP), we thank you for the opportunity to provide comments on the Department of Water Resources (DWR) Draft Report to the Legislature on the Results of the Indoor Residential Water Use Studies (Draft Report). Attachment 3 to this letter provides a description of the organizations contributing these comments.

At the outset, we recognize, appreciate, and agree that water conservation is, and must be, a way of life with our growing population and the impacts of climate change. We appreciate the State's leadership through DWR and the State Water Resources Control Board (SWRCB) in addressing the current drought emergency. We also commend the State's local and regional drinking water agencies for their investments in conservation and achievements in substantially reducing water usage in their respective service areas.

Within this context, we do have a key overarching concern with the Draft Report. While not the focus of the proposed indoor water use standards, California sanitation agencies will need to mitigate the impacts these reduced flows will have on the operation and efficacy of wastewater collection systems and treatment plants, which are designed for significantly greater flows than those proposed in the Draft Report. Attachment 1 to this letter sets forth a number of material impacts and adverse effects of significantly lower flows on wastewater and recycled water infrastructure. We do not suggest that these potential impacts in and of themselves outweigh the water supply benefits of indoor water conservation. They are, however, important and relevant considerations. These operational, financial, and water quality impacts need to be fully understood and evaluated in order to select appropriate and sustainable standards, avoid unintended consequences, and best plan to provide the funding and support needed to mitigate these ancillary impacts of new indoor water standards.

Toward this point, DWR acknowledges that the Draft Report does not analyze or consider these impacts, which is one of its express limitations. Section 7 of the Draft Report notes adoption of the proposed standards will have an "unknown effect on affordability, unknown effect on the human right to water" and that there has been, "no quantitative analysis of benefits and impacts, [and] no analysis on feasibility of best practices."

If DWR believes that a revised standard should be proposed in the report to the Legislature, any revised standard put forward must be supported by appropriate information from specified studies and investigations reflecting different best practices for indoor residential water use than the current ones.[1]

Absent a feasibility analysis of best practices, and given that the Draft Report would first effectuate a change in the revised standard in 2025, we respectfully recommend that, consistent with the Water Code, DWR incorporate an analysis of the how the changing standard for indoor residential water use will impact wastewater management, recycling and reuse systems, infrastructure, operations, and supplies. This analysis is essential to determine the impacts that would result from a revised standard, and whether those impacts would fit within the definition of "best practices" for indoor residential water use standards.

[1] Water Code § 10609.4 (b)(1): The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

The SWRCB currently is overseeing such analyses, which will be available between November 2021 and January 2022. This analysis is part of the Standard Regulatory Impact Assessment (SRIA) being conducted for the SWRCB's forthcoming regulatory proceedings on the long-term water use efficiency standards, and it features empirical analysis of the impacts by economists. Accordingly, we urge against recommending a firm revised standard at this time as part of the Draft Report, and instead, recommend DWR put forth a provisional recommendation taking into account the caveat of additional analytical work being performed to ensure the feasibility of implementing a final recommendation. This recommendation would have no impact on expected water savings in the interim, could avoid unnecessary adverse impacts to water and wastewater management, and would allow the Department to fulfill the statutory requirements to collaborate and analyze the impacts on water management.

Significantly, it should be noted that in the next 5 to 10 years, several potable reuse projects are anticipated to become operational, offsetting potable water demands. However, the proposed indoor conservation standards could reduce influent availability for these projects, which can adversely impact the efficiency and economic viability of these important potable water augmentation projects. Attachment 2 to this letter is a partial list of permitted and planned potable reuse projects in progress totaling over 700,000 acre feet per year. Before proposing a standard that will further reduce flows and water available to those facilities for recycling, such potential impacts and offsets should be thoroughly analyzed.

Conclusion

The 2018 water conservation legislation set a bold usage target of 50 gallons per day per capita (GPCD) statewide by 2030. Remarkably and commendably, with decades of investments, nearly half of urban water suppliers are estimated to have already achieved this target. However, half have not, and they will need support to get there. With the progress already achieved, going further to reduce another 10% below the 2025 target or 16% below the 2030 target, as the Draft Report recommends, becomes exponentially more challenging, in part due to the heightened effects on wastewater collection systems, treatment plants, and recycled water programs.

Accordingly, we encourage your consideration of including such analyses of the actual impacts and costs to our members by harnessing the SWRCB's SRIA analysis. To be sure, our members will need financial assistance and support to address these impacts and, changes in the approach – such as a higher 2025 standard – may provide a better glide path for achieving the targets while also allowing time to make the necessary investments in wastewater infrastructure. However, any approach should be supported by a thorough analysis of impacts to wastewater agencies.

In closing, we express our appreciation to Sabrina Cook and the team at DWR and Charlotte Ely and the SWRCB team for their accessibility, meeting with our coalition, and having in-depth dialogues since the revised standard was unveiled at the end of April. If there any questions about our comments, please do not hesitate to contact Jared Voskuhl at (916) 694-9269 or at jvoskuhl@casaweb.org.

Thank you,

Jared Voskuhl	Debbie Webster	Jenn Jones	Steve Jepsen
CASA Manager of Regulatory Affairs	CVCWA Executive Officer	CWEA Executive Director	SCAP Executive Director

cc: Joaquin Esquivel, SWB Chair
Sabrina Cook, DWR

Attachments: Attachment 1 – Potential Impacts to Wastewater and Recycled Water Infrastructure
Attachment 2 – Potable Reuse Projects
Attachment 3 – Commenting Associations' Descriptions
Attachment 4 – City of San Diego, Case Study: Potential Impacts of Reduced Flows (2018)

Attachment 1 - Potential Impacts to Wastewater and Recycled Water Infrastructure

There are three general areas where material impacts of lower flows are realized on wastewater infrastructure: sewer collection systems, wastewater treatment plants, and recycled water.

(1) For *collection systems and the conveyance of wastewater*, our infrastructure and pipes were designed for specific flows which the 2018 targets already present real challenges and will require steep financial investment for collection systems to prepare. As experienced by our members throughout the state during the last droughts, when sewer lines don't have the flow factors for which they are designed, problems are created. With less flow, there is less velocity, and solids kept in the sewer stream begin to collect and store in pipelines, causing issues with odors, corrosion and blockages that can lead to sewer overflows. Most of these issues can be managed with increased maintenance, such as flushing with potable or recycled water which cuts against the intent to conserve more water. However, some impacts require significant investment in additional infrastructure to amend.

In the state's CIWQS database, all of the nearly 1,200 enrollees' combined collection systems total approximately 205,000 miles, and our members will need assistance and support to minimize the expected impacts to their infrastructure. For example, the City of San Diego, with approximately 3,000 miles of sewers, estimated in their analysis of the impacts of the 2018 Standards that they will incur $125,000 in additional costs annually for odor control chemicals, as well as $3.5 million in accelerated investments to mitigate corrosion. Similarly, a medium sized municipality utilizes siphons in their collection systems, and these are getting more readily clogged because of lack of flow to move solids in the line. This is resulting in more maintenance for the City, and the City is examining whether to undertake capital projects to replace the siphons altogether.

(2) Impacts at *wastewater treatment plants* (WWTPs) also are observed, where higher salinity and concentrations of solids and nutrients in the influent due to conservation result in more costs for chemicals and energy for treatment during the aeration stage. Additionally, conservation can impact a WWTP's ability to comply with its waste discharge requirements. These impacts can intensify with population density and population growth. For example, the City of San Diego estimated nearly $30 million in capital costs for one of its reclamation plants to relocate a pump station and expand the facility due to lower flows and additional treatment needed. Additionally, because conservation flows were different than design conditions, some WWTP's in the Central Valley were not able to meet their nitrogen-based limits (nitrate and/or ammonia) due to the higher concentrations in influent due to treatment design that did not account for these high influent concentrations of nitrogen despite being significantly below the treatment capacity of the WWTP. Finally, salts are more difficult to remove. Salt is a long-term ongoing issue, especially for inland areas without brine lines. Increased salts can impact the ability to discharge into a surface or ground water and recycle water.

(3) For *recycled water,* the impacts of increased salinity are a concern because of treatment processes, but more fundamentally, it is very challenging for our members to plan for decreased flows, which disincentivizes communities investing in water recycling. Some of our members can mitigate for the salinity issue by blending potable water with recycled water, which again cuts against the intent to conserve more water. An alternative for is to use reverse osmosis, a process that removes salt from recycled water, which has a higher cost and higher energy use than traditional Title 22 projects, and results in a concentrate that must be managed and disposed.

Compounding the economic impacts are thornier legal issues because of existing agreements for specified flow for habitat preservation which may be required in order to provide recycle water. For example, a medium sized municipality is part of a recycled water program, and they are in effect paid to recycle water and send it to a nearby canal for the flow. Now with reduced flow, they don't have the supply to meet their obligations. Similarly, another smaller municipality provides recycled water for irrigation and agricultural lands. With conservation, their flows have gone down nearly one million gallons a day, despite a population increase. This has real impacts on the city's local economy to not have that quantity of recycled water supply as this community relies on its agricultural economy. In another instance for a special district, they are struggling to meet their recycled water obligations because flows have already gone down significantly during drought, so they are supplementing with groundwater, and looking for additional sources of water.

In all of these cases, when underlying decisions or agreements were made, recycled water flows were higher when agreements/requirements were made. Now despite the infrastructure investments, decreased flows have resulted in less recycled water thereby stranding assets, or significantly increasing the risk for as much. Additionally, the obligation to release potable water to maintain habitat flows is not lessened, although less water overall is used.

Attachment 2: Potable Reuse Projects

Permitted Potable Reuse Projects

Agency	Purpose	AFY
IEUA - Chino Basin	Groundwater Augmentation	21,000
LA County Dominguez Gap Barrier	Groundwater Augmentation	7,200
LACSD-WRD Montebello Forebay	Groundwater Augmentation	50,000
Monterey Pure Water	Groundwater Augmentation	3,500
Orange County Water District (Injection & Spreading)	Groundwater Augmentation	100,000
Orange County Water District Alamitos Barrier	Groundwater Augmentation	9,000
West Basin West Coast Barrier	Groundwater Augmentation	17,000
TOTAL		**207,000**

Planned Potable Reuse Projects

Agency	Purpose	AFY
City of Escondido	Groundwater Augmentation	9,000
City of Los Angeles	Groundwater Augmentation	30,000
City of Oceanside	Groundwater Augmentation	5,000
City of Oxnard	Groundwater Augmentation	7,000
City of San Diego Pure Water Project	Reservoir Water Augmentation	93,000
City of Ventura	Groundwater Augmentation	4,000
East Valley Water District	Groundwater Augmentation	11,000
Eastern Municipal Water District	Groundwater Augmentation	15,000
Encina Wastewater Authority	Raw Water Augmentation	32,000
IEUA - Chino Basin	Groundwater Augmentation	8,600
LACSD & Metropolitan Water District	Groundwater Augmentation	168,000
Las Virgenes-Triunfo Pure Water Project	Reservoir Water Augmentation	5,000
Orange County Water District	Groundwater Augmentation	31,000
Padre Dam Municipal Water District	Reservoir Water Augmentation	13,000
Palmdale Water District	Groundwater Augmentation	4,000
Santa Clara Valley Water District	Groundwater Augmentation	45,000
Upper San Gabriel Valley Municipal Water District	Groundwater Augmentation	10,000
Water Replenishment District S. CA, GRIP Project	Groundwater Augmentation	21,000
Yucaipa Valley Water District	Groundwater Augmentation	5,000
TOTAL		**516,000**

Attachment 3: Commenting Associations' Descriptions

CASA

The California Association of Sanitation Agencies (CASA) represents more than 125 public agencies and municipalities that engage in wastewater collection, treatment, recycling, and resource recovery, and our mission is to provide trusted information and advocacy on behalf of California clean water agencies, and to be a leader in sustainability and utilization of renewable resources.

CVCWA

The Central Valley Clean Water Association (CVCWA) is a non-profit association of public agencies located within the Central Valley region that provide wastewater collection, treatment, and water recycling services to millions of Central Valley residents and businesses. CVCWA was primarily formed to concentrate resources to effect reasonable local, state and federal regulations impacting entities operating municipal wastewater treatment plants and wastewater and storm drain collections systems in the Central Valley. CVCWA is currently comprised of over 50 public wastewater collection and treatment member agencies, representing over 7 million people in the Central Valley. Additionally, CVCWA has over 20 associate members. Our members are public and private organizations charged with the responsibility for collecting, treating, recycling, and disposing of wastewater in a safe, responsible and economical manner.

CWEA

The California Water Environment Association (CWEA) empowers wastewater professionals as they protect California's most critical resource: water. Since our founding in 1928, we've grown to a community of more than 10,000 members across all facets of wastewater management and resource recovery, from operators to lab techs to engineers. CWEA's mission is to increase the effectiveness of California's water environment professionals through education, certification, and promotion of sound policies to benefit society by protecting the water environment.

SCAP

The Southern California Alliance of Publicly Owned Treatment Works (SCAP) is a non-profit association representing over 80 public water/wastewater agencies in southern California who provide essential water supply and wastewater treatment for approximately 20 million people in the counties of Los Angeles, Orange, San Diego, Santa Barbara, Riverside, San Bernardino and Ventura. SCAP's wastewater members provide environmentally sound, cost-effective management of more than two billion gallons of wastewater each day and, in the process of protecting public health and the environment, convert wastewater into resources for beneficial uses such as recycled water and renewable energy.

City of San Diego

CASE STUDY //

Potential Impacts of Reduced Flows

FINAL | APRIL 2018 (revised June 2018)

table of contents

SD

Brown AND Caldwell

Table of Contents

LIST OF ABBREVIATIONS

AWPF	advanced water purification facility
BOD	biological oxygen demand
BSO	bad sewer odor
CCR	California Code of Regulations
City	City of San Diego
CUWA	California Urban Water Agencies
DWR	Department of Water Resources
EO	Executive Order
EO Agencies	Collectively: the California Department of Water Resources, State Water Resources Control Board, California Public Utilities Commission, California Department of Food and Agriculture, and the California Energy Commission
GHG	greenhouse gas
gpcd	gallons per capita per day
H_2S	hydrogen sulfide
mg/L	milligrams per liter
mgd	million gallons per day
MPS	Moreno Pump Station
N/A	not applicable
NCPWF	North City Pure Water Facility
NCWRP	North City Water Reclamation Plant
NPR	non-potable reuse
NPV	net present value
O&M	operations and maintenance
RCP	reinforced concrete pipe
R-gpcd	residential gallons per capita per day
RO	reverse osmosis
SBWRP	South Bay Water Reclamation Plant
SCSC	Southern California Salinity Coalition
SSO	sanitary sewer overflow
TDS	total dissolved solids
TOC	total organic carbon
Total N	total nitrogen
TSS	total suspended solids
WUE	water use efficiency

Executive Summary

Motivated by the most recent drought, new regulations for indoor and outdoor usage are currently under development to ensure water supply reliability and resiliency for California. However, these regulations could contribute to declining flows in the urban water cycle, leading to potential economic, environmental and social impacts. This case study aims to leverage the historical data of City of San Diego's (City's) unique integrated water, wastewater, and recycled water system to understand the potential impacts of those declining flows.

Background and Objective

With climate change expected to exacerbate the frequency and intensity of future droughts (USGCRP, 2017) and deepen the need for a resilient water supply, California is working to better manage its finite water resources. Achieving lasting water supply reliability in the state of California requires collaboration between state regulators and local municipalities and an understanding of the interconnected nature of our water systems.

California water agencies continue to prioritize wise water use through both short-term conservation efforts (i.e., in response to a drought or emergency) and long-term water use efficiency (WUE) strategies for lasting, sustainable effects. Understanding how wise water use can affect an interconnected water supply system is critical to optimizing future water management. **This case study leverages observations from the City of San Diego (City)—a leader in integrated water resources management, water use efficiency, and water supply diversification—to help inform and optimize an important aspect of future water management in California.**

Making Conservation a California Way of Life

In 2016, Governor Brown issued Executive Order (EO) B-37-16 to reinforce key strategies addressed in the California Water Action Plan, namely *Making Water Conservation a California Way of Life*. Through this EO, the Governor directed state agencies to develop a long-term WUE framework and improve planning to support California's water supply reliability and resiliency. In April 2017, the EO Agencies released the final report, *"Making Water Conservation a California Way of Life,"* which specifies the process for urban water suppliers to meet new, long-term water use targets (California Department of Water Resources [DWR], 2017).

The report proposes setting water use targets as an aggregate total of three per capita water use budgets: residential indoor use, outdoor irrigation use, and distribution system water losses (DWR et al., 2017).

Supplier water use target = (indoor water use budget)

+ (outdoor water use budget) + (water loss budget)

The "residential indoor water use standard," represented as residential gallons per capita per day (R-gpcd), is defined as "the volume of residential indoor water used by each person per day, expressed in gpcd" (DWR, 2017). This standard is used to calculate a water supplier's "indoor water use budget," which is a function of the total service area population; i.e.:

Residential indoor water use budget = (service area population)

x (residential indoor standard) x (number of days in a year)

Invested in Water Supply Reliability

With a population of 1.3 million people, the City is the eighth largest city in the United States. The City provides drinking water, wastewater, and recycled water services, managing 9 surface water reservoirs and 3 water treatment plants. The City provides wastewater treatment services for a population of 2.2 million people over a 450-square-mile area that currently generates approximately 140 million gallons per day (mgd) of wastewater. They transport and manage the wastewater through their miles of wastewater pipelines, three wastewater treatment plants, and biosolids treatment facility (Figure ES-1).

Local water availability has always been an issue for the City due to its location in the dry Mediterranean climate of coastal southern California. On average, the City imports approximately 85 percent of its water from other areas, specifically Northern California and the Colorado River. Thus, the importance of water supply reliability, resiliency, and diversification has always been paramount in the City's water supply strategy.

Figure ES-1. The City provides wastewater services to 2.2 million people and treats up to ~140 million gallons of wastewater per day.

The City's Continued Commitment to Conservation

The City, recognizing the vital role that conservation plays in its water supply strategy, and has been a leader in promoting conservation and WUE measures. The City manages a "San Diegans Waste No Water" campaign, which informs individuals about the state's current water use restrictions and explains how consumers can reduce their water use. Figure ES-2 illustrates the steady decline in R-gpcd in the City over the past decade. Since June 2015, the City has realized a cumulative water savings of 16.2 percent (compared to 2013 values).

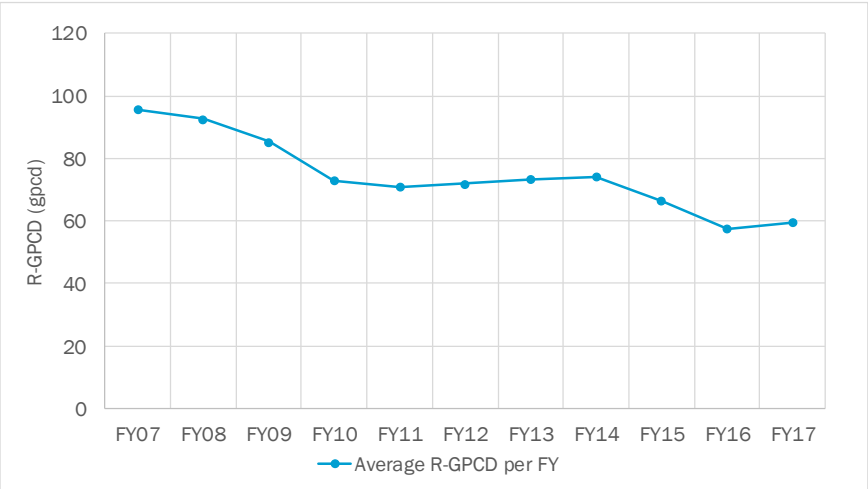


Figure ES-2. They City's average R-gpcd per year has steadily declined from 2006.

However, while WUE is an important element of water management programs, it is not in itself sufficient to manage all future water demands. State and local agencies recognize that it is only part of a multi-faceted strategy for water supply reliability. Increased conservation and water use efficiency can also contribute to declining flows in the urban water cycle. These declining flows, coupled with increasing contaminant concentrations, can have implications on the City's integrated water, wastewater, and recycled water systems. To best support water supply reliability, the City is taking a proactive, holistic planning approach that examines and considers these impacts.

Better Understanding the Potential Impact of Declining Flows in the City of San Diego

The interconnected nature of the water system means that change in one part of the cycle will have a ripple effect, both positive and negative, on other parts of the system. A recently published white paper by the California Urban Water Agencies (CUWA), titled "Adapting to Change: Utility Systems and Declining Flows," examined the impacts of declining flows through the observations of utilities impacted by emergency conservation measures in 2015 and 2016, and used these observations to provide insight and inform the state's long-term WUE policies. A survey conducted by CUWA indicated that impacts are widespread across the state in all parts of the engineered water system (Figure ES-3).

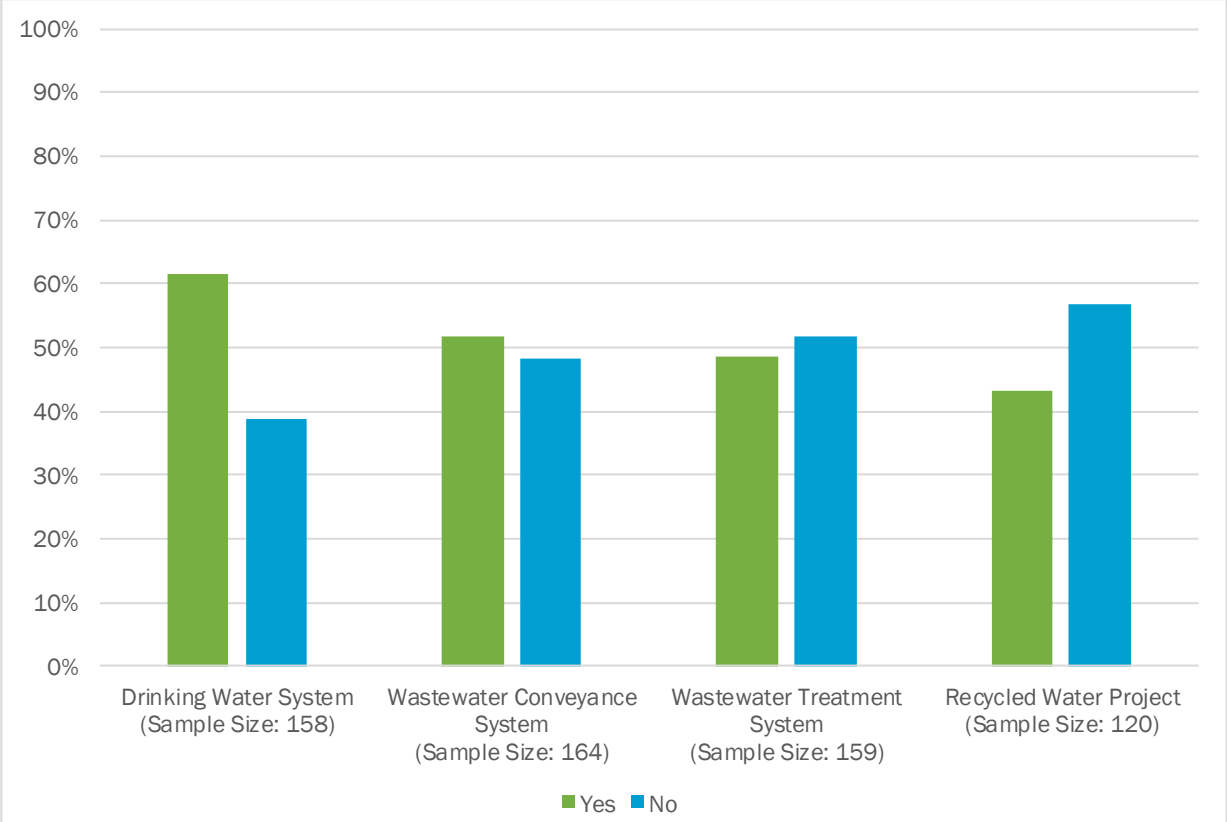


Figure ES-3. Survey respondents experienced impacts of water conservation in all system types.

Source: CUWA, 2017

The objective of this project is to build upon CUWA's research and leverage the City's historical data to better understand and quantify the potential impacts of declining flows within the context of the City's integrated plan for greater supply reliability.

The Methodology

This case study leverages 10 years of historical data to evaluate the potential impacts reduced flows may have on the City's water, wastewater and recycled water systems. Two scenarios were evaluated—a baseline and reduced flow scenario—to assess projected impacts including financial, social, and environmental considerations.

Defining Two Comparative Scenarios

The Baseline scenario represents existing conditions including implementation of the Pure Water Program as designed. The Reduced Flows scenario represents a theoretical situation where flows are dramatically reduced through a combination of WUE strategies, as well as other consumer behavior adjustments such as greywater or decentralized reuse.

Evaluating Impacts through a Triple Bottom Line Context

To provide a holistic perspective, this case study examines each potential impact identified as part of the comparative analysis through a triple bottom line lens. This means that each impact is reviewed from an economic, environmental, and social perspective (Figure ES-4).

Baseline

The Baseline scenario will be the design criteria established for the Pure Water Program, which includes an R-gpcd starting at 55 and reducing to 52 gpcd by 2035.

Reduced Flows

The Reduced Flows scenario assumes an R-gpcd of 35 which considers intensified WUE strategies and other consumer behavior adjustments that will reduce the amount of flows into the wastewater system.

Figure ES-4. Each impact was reviewed through a triple bottom line context, which considers economic, environmental, and social perspectives.

Impacts of Declining Flows on the Urban Water Cycle

CUWA's white paper on *Adapting to Change: Declining Flows and Utility Systems* (CUWA, 2017) researched the potential impacts of declining flows on the interconnected water systems, including drinking water distribution, wastewater conveyance, wastewater treatment, and recycled water projects (Figure ES-5).

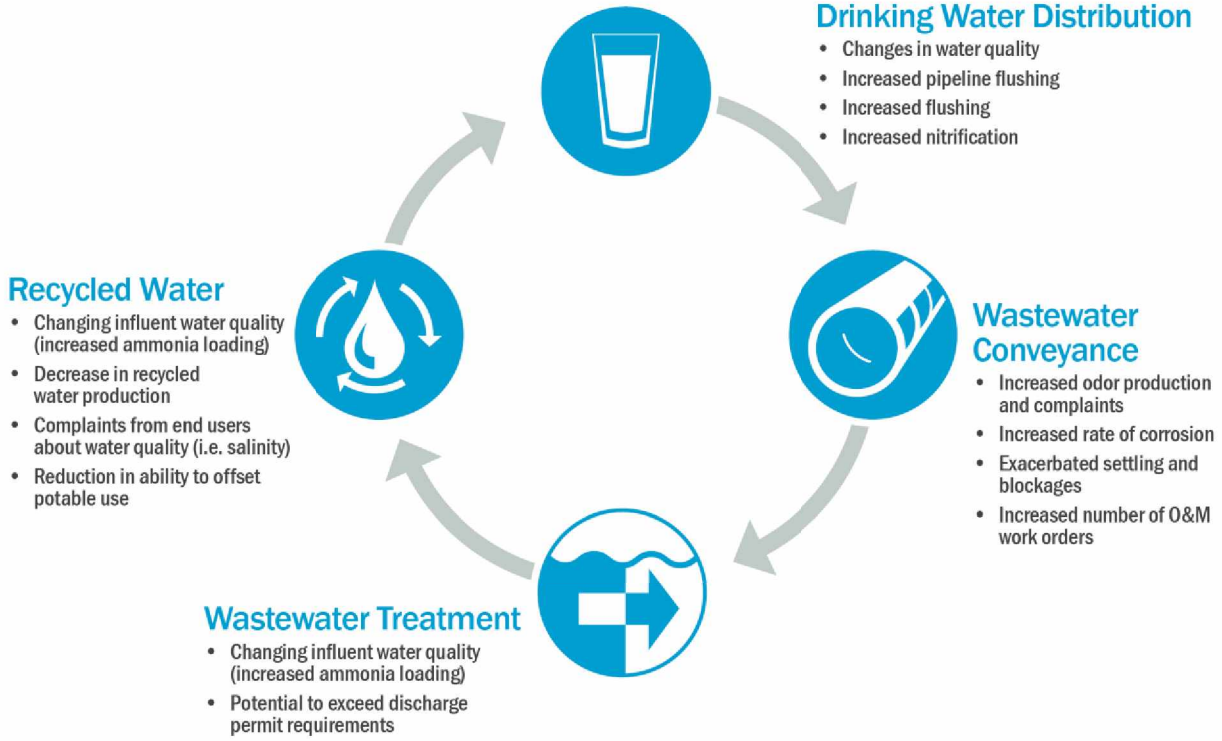


Figure ES-5. Declining flows in the urban water cycle can potentially impact all areas of the cycle.

Source: CUWA, 2017

Leveraging Historical Data to Identify Impacts in San Diego

Historical data and research conducted within the North City sewershed were analyzed to identify any impacts the City may have experienced due to declining flows observed over the past decade. The datasets analyzed and impacts identified (as applicable) are summarized in Table ES-1.

Limitations of the Analysis

This high-level assessment consists of reviewing pertinent datasets that might demonstrate the potential impacts identified through CUWA's research. It's important to highlight the limitations of this assessment, as it draws upon correlation to identify impacts caused by declining flows. Correlation does not equal causation. However, for the sake of this high-level assessment, the correlations that appear will be leveraged and quantified (as appropriate) to provide an order of magnitude perspective on the potential social, environmental, and economic impacts of declining flows.

Table ES 1. Summary of Impacts on the Wastewater Conveyance, Wastewater Treatment, and Recycled Water Systems					
			Quantitative	Qualitative	
System	Potential Impact due to Declining Flows	Type of Analysis to Quantify Impact	Economic 	Environmental	Social
Wastewater Conveyance System	Increase in odor production, leading to an increase in bad sewer odor work orders.	Minimal correlation was observed between declining R-gpcd and BSO work orders.	N/A	N/A	N/A
	Increase in odor production, leading to an increase in odor control chemical, Bioxide® use and trucking.	Used observed correlation to calculate increase in Bioxide® purchase.	Increased Bioxide® purchase: $125,000/year	Increased GHG emissions from increased trucking for Bioxide® injection.	Increased odors in communities.
	Acceleration in the rate of corrosion, leading to accelerated degradation of the City's concrete manholes.	Used theoretical equations to estimate the accelerated rate of corrosion.	Capital expenditures to rehabilitate manholes earlier than expected: $850,000/year more than baseline for 4 years	Increased construction for manhole rehabilitation requires additional equipment, leading to an increase in GHG emissions.	Increased rehabilitation of manholes disrupts local communities.
Wastewater Treatment System	Increase in TSS and BOD concentrations and mass loading, requiring additional capacity at the NCWRP.	Increasing TSS and BOD trends are observed.	The cost of increased capacity at the NCWRP: $8,600,000 (limited to a one-time capital expenditure)	Increased GHG emissions from increased trucking and power production.	Undermines the Pure Water program, which serves as a reliable and sustainable source of drinking water.
	Declining flows reduce the flows at the current MPS site, leading to a loss of 6 mgd of source wastewater.	The MPS could be relocated to recover those lost flows.	Cost of MPS relocation: Capital - $20,500,000 (one-time cost) Increase in O&M - $50,000 (annual)	Relocation of the MPS would require a tunnel crossing under the san Diego River, which impacts the surrounding environment.	The additional two miles needed for the MPS relocation would result in more disruption to surrounding communities.
		However, the MPS is unlikely to be relocated due to site constraints, leading to a loss of 4.8 mgd (assuming 70% recovery) of purified water.	Value of lost 4.8 mgd: $4,500,000/year		Undermines the Pure Water program, which serves as a reliable and sustainable source of drinking water.
Advanced Water Purification Facility	Increases in constituents (TDS, TOC, Nitrogen) in the RO permeate.	Impact not observed.	N/A	N/A	N/A

BOD = biological oxygen demand; BSO = bad sewer odor; GHG = greenhouse gas; mgd = million gallons per day; MPS = Moreno Pump Station; N/A = not applicable; NCWRP = North City Water Reclamation Plant; RO = reverse osmosis; TDS = total dissolved solids; TOC = total organic carbon; TSS = total suspended solids.

Net Present Value (NPV) Analysis of All Economic Impacts

Each of the economic impacts was imported into a net present value (NPV) calculation to quantify cumulative impacts from 2017 through 2035, and the life cycle cost of ownership for this option is $102,000,000 (i.e. the NPV is negative $102,000,000). Table ES-2 summarizes these impacts.

Table ES 2. Economic Impacts of the Reduced Flow Scenario

Economic Impact	Value	One-Time Cost or Annual
Wastewater Conveyance		
Increase in Bioxide® Purchases	$125,000	Annual
Accelerated Investment due to Corrosion	An increase of $850,000 per year for four years.	Not Included in NPV
Wastewater Treatment		
Increase in NCWRP Expansion	$8,600,000	One-Time
Relocation of the MPS (Capital)	$20,500,000	One-Time
Relocation of the MPS (Operations)	$50,000	Annual
Value of the 6 mgd	$4,5000,000	Annual
NPV Total (through 2035)	($102,000,000)	

BSOs = bad sewer odors; mgd = million gallons per day; MPS = Moreno Pump Station; NCWRP = North City Water Reclamation Plant.

Conclusions and Next Steps

As water use targets and standards are currently in development, it is vital to understand the impacts of these policies on the interconnected urban water cycle. As utilities continue to invest in programs and infrastructure that support water supply reliability, it is important to consider how different water supply reliability strategies, like WUE and water supply diversification, can impact each other. The City, as a leader in both strategies, can serve as a valuable case study to provide insight into what those impacts may be.

This case study reveals that significantly reduced flows could cost the City on the order of $102,000,000 through 2035, in addition to environmental and social impacts within the region. **These impacts underscore the importance of a holistic analysis of the urban water cycle to ensure development of the best water management plan, as each utility's experience is unique to its water supply situation. This uniqueness also highlights the importance of flexibility in statewide water use standards.**

It's important to note that there are some benefits and impacts of reduced flows that were not quantified in this case study, but are important and should be investigated further. The benefits include:

- Reduced use of water (including imported and desalinated), and the related financial savings and environmental benefits.
- Reduced energy and chemical use in drinking water and wastewater conveyance and treatment.

This report also focused on the impacts of reduced flows from indoor residential use as those flows remain within the interconnected urban water cycle. However, there may also be impacts from reduced outdoor irrigation use including the loss of areas landscaped with irrigated plants, which provide benefits like improved aesthetics, mitigation against the heat-island effect, and increased property values.

Ultimately, increasing water use efficiency has both benefits and potential impacts on water, wastewater, and recycled water systems, which can be balanced through informed policy. A holistic, one-water approach can benefit smart policy and provide the best solutions in managing California's water resources.

SECTION 1

Background and Objective

Water is an invaluable and finite resource in California, and sustainable water management is a collaborative effort between state regulators and local municipalities. Motivated by the most recent drought, new regulations are currently under development to ensure water supply reliability and resiliency for California.

1.1 Supporting Sustainable Water Management in California

With climate change expected to exacerbate the frequency and intensity of future droughts (USGCRP, 2017) and deepen the need for a resilient water supply, California is working to better manage its finite water resources. The Governor's California Water Action Plan provides a roadmap for sustainable water management throughout the state. The plan encourages several actions associated with achieving greater water supply including but not limited to making conservation a California way of life (Action No. 1), and increasing regional self-reliance and integrated water management across all levels of government (Action No. 2).

Achieving lasting water supply reliability in the state of California requires collaboration between state regulators and local municipalities and an understanding of the interconnectedness of our water systems. This case study leverages observations from the City of San Diego (City)—a leader in integrated water management, water use efficiency, and water supply diversification—to help inform and optimize an important aspect of future water management in California.

1.2 Making Conservation a California Way of Life

Encouraging wise water use and strengthening local and regional drought planning are critical to California's resilience to drought and climate change. In 2016, Governor Brown issued Executive Order (EO) B-37-16 to reinforce key strategies addressed in the California Water Action Plan, namely *Making Water Conservation a California Way of Life*.

Through this EO, the Governor directed state agencies to develop a long-term water use efficiency (WUE) framework and improve planning to support California's water supply reliability and resiliency. To achieve the objectives of the EO, several state agencies came together, including the California Department of Water Resources (DWR), State Water Resources Control Board, California Public Utilities Commission, California Department of Food and Agriculture, and the California Energy Commission (collectively referred as the "EO Agencies"). In April 2017, the EO Agencies released the final report, "Making Water Conservation a California Way of Life," which specifies the process for urban water suppliers to meet new, long-term water use targets (DWR, 2017).

The report proposes setting water use targets as an aggregate total of three per capita water use budgets: residential indoor use, outdoor irrigation use, and distribution system water losses (DWR et al., 2017).

supplier water use target = (indoor water use budget)

+ (outdoor water use budget) + (water loss budget)

While the supplier water use target includes three separate considerations, this case study focuses on the indoor water use budget, as these flows remain within the engineering water system. The "residential indoor water use standard," represented as residential gallons per capita per day (R-gpcd), is defined as "the volume of residential indoor water used by each person per day, expressed in gpcd" (DWR, 2017). This standard is used to calculate a water supplier's "indoor water use budget," which is a function of the total service area population; i.e.:

Residential indoor water use budget = (service area population)

x (residential indoor standard) x (number of days in a year)

Senate Bill x7-7 established 55 gallons per capita per day (gpcd) as a provisional residential indoor standard per California Water Code 19608.20(b)(2)(A). The Senate Bill x7-7standard will apply until the new standard for residential indoor water use is established. As standards are developed, the potential impacts of reduced indoor water use on water, wastewater, and recycled water systems are a critical consideration.

However, while WUE is an important element of water management programs, it is not in itself sufficient to manage all future water demands. The California Water Action Plan acknowledges the need for more comprehensive water management and supports making regions more self-reliant through the development of new or underused local water resources. Therefore, new water use targets must be compatible with the goal of expanding recycled water supplies.

1.3 Invested in Water Supply Reliability

With a population of 1.3 million people, the City is the eighth largest city in the United States. The City provides drinking water, wastewater, and recycled water services to its population, and manages 9 surface water reservoirs, 3 water treatment plants, 47 pump stations, and approximately 3,200 miles of water transmission and distribution pipelines. The City also provides wastewater treatment services for a population of 2.2 million people over a 450-square-mile area that currently generates approximately 140 million gallons per day (mgd) of wastewater. They transport and manage the wastewater through their miles of wastewater pipelines, three wastewater treatment plants, and biosolids treatment facility (Figure 1-1).

Figure 1-1. The City provides wastewater services to 2.2 million people and treats up to ~180 million gallons of wastewater per day.

Source: City of San Diego, 2018a

Local water availability has always been an issue for the City due to its location in the dry Mediterranean climate of coastal southern California, where rainfall averages only 10 inches per year at the coast and can vary tremendously from year to year. On average, the City imports approximately 85 percent of its water from other areas, specifically Northern California and the Colorado River. Thus, the importance of water supply reliability, resiliency, and diversification has always been paramount in the City's water supply strategy.

The City's Continued Commitment to Conservation

The City, recognizing the vital role that conservation plays in its water supply strategy, and has been a leader in promoting conservation and water use efficiency measures. The City manages a "San Diegans Waste No Water" campaign, which informs individuals about the state's current water use restrictions and explains how consumers can reduce their water use. They've also set permanent water use restrictions to discourage water waste and funded a variety of programs to incentivize customers to reduce indoor and outdoor water use, including turf replacement rebates and landscape design workshops for homeowners. Figure 1-2 illustrates the steady decline in R-gpcd in the City over the past decade. Since June 2015, the City has realized a cumulative water savings of 16.2 percent (compared to 2013 values).

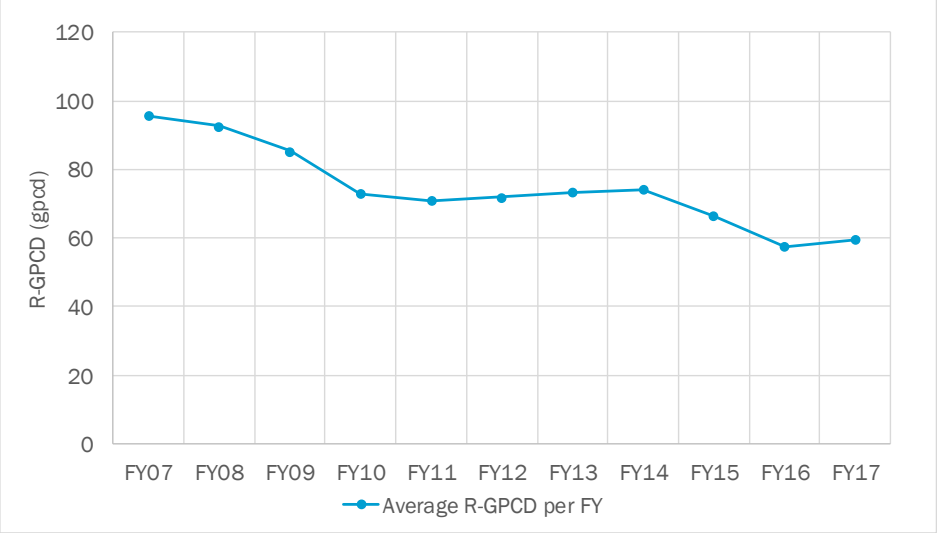


Figure 1-2. The City's average R-gpcd per year declined from fiscal years 2006 through 2017.

However, increased conservation and water use efficiency contributes to declining flows in the urban water cycle (Figure 1-3). These declining flows, coupled with increasing contaminant concentrations, can have implications on the City's integrated water, wastewater, and recycled water systems. To best support water supply reliability, the City is taking a proactive, holistic planning approach that examines and considers these impacts.

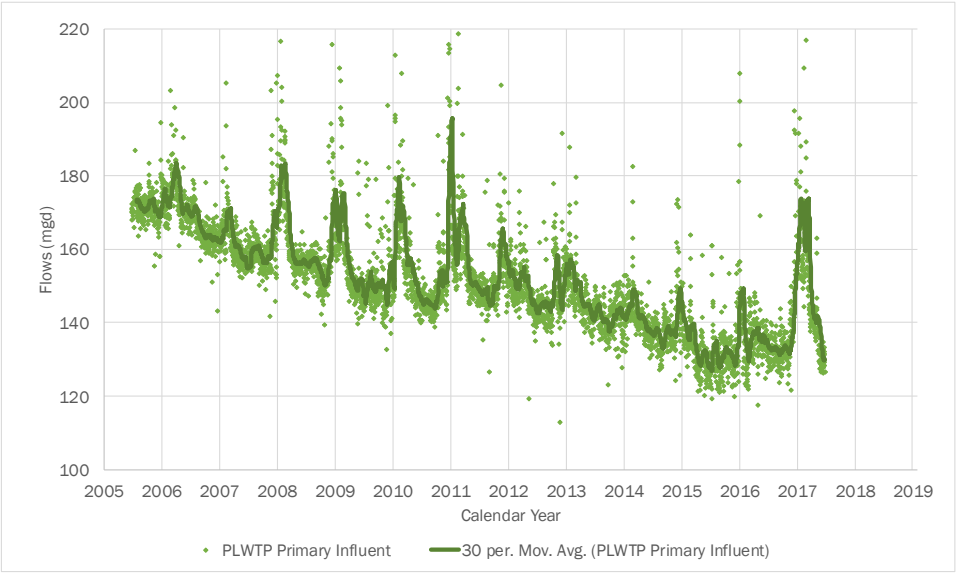


Figure 1-3. Influent flows at the Point Loma Wastewater Treatment Plant (PLWTP) declined24 percent from 2006 through 2017.

Water Diversification is a Critical Component of Water Supply Reliability

While conservation is an important component for sustainable water management, both state and local agencies recognize that it is only part of a multi-faceted strategy for water supply reliability. Given the City's semi-arid location, and that the cost of imported water is forecasted to double in the next 10 years, the City has proactively invested in producing a local supply of water through the Pure Water Program, which treats wastewater for potable reuse. (Figure 1-4). The program is designed to be a phased, multi-year program with the goal of providing one-third of the City's water supply locally by 2035.

The City, as an integrated municipal entity responsible for water, wastewater, and recycled water systems, and as a leader in demand management and water supply diversification, provides an insightful perspective on how best to establish a holistic strategy for supply reliability that considers the interconnectedness of the entire urban water cycle.

Figure 1-4. The Pure Water Program is an important part of the City's water supply reliability strategy.

Source: City of San Diego, 2017a

1.4 Better Understanding the Potential Impact of Declining Flows in the City of San Diego

The interconnected nature of the water system means that change in one part of the cycle will have inevitable impacts, both positive and negative, on other parts of the system. A recently published white paper by the California Urban Water Agencies (CUWA), titled "Adapting to Change: Utility Systems and Declining Flows," examined the impacts of declining flows through the observations of utilities impacted by emergency conservation measures in 2015 and 2016, and used these observations to provide insight and inform the state's long-term WUE policies.

The report included a literature review of potential impacts of declining flows, a high-level survey to determine the level and range of observed impacts in California, and case studies based on one-on-one interviews that illustrate the broad range of issues agencies experience and the impact of these issues. Survey results indicate that impacts are widespread across the state in all parts of the engineered water system (Figure 1-5).

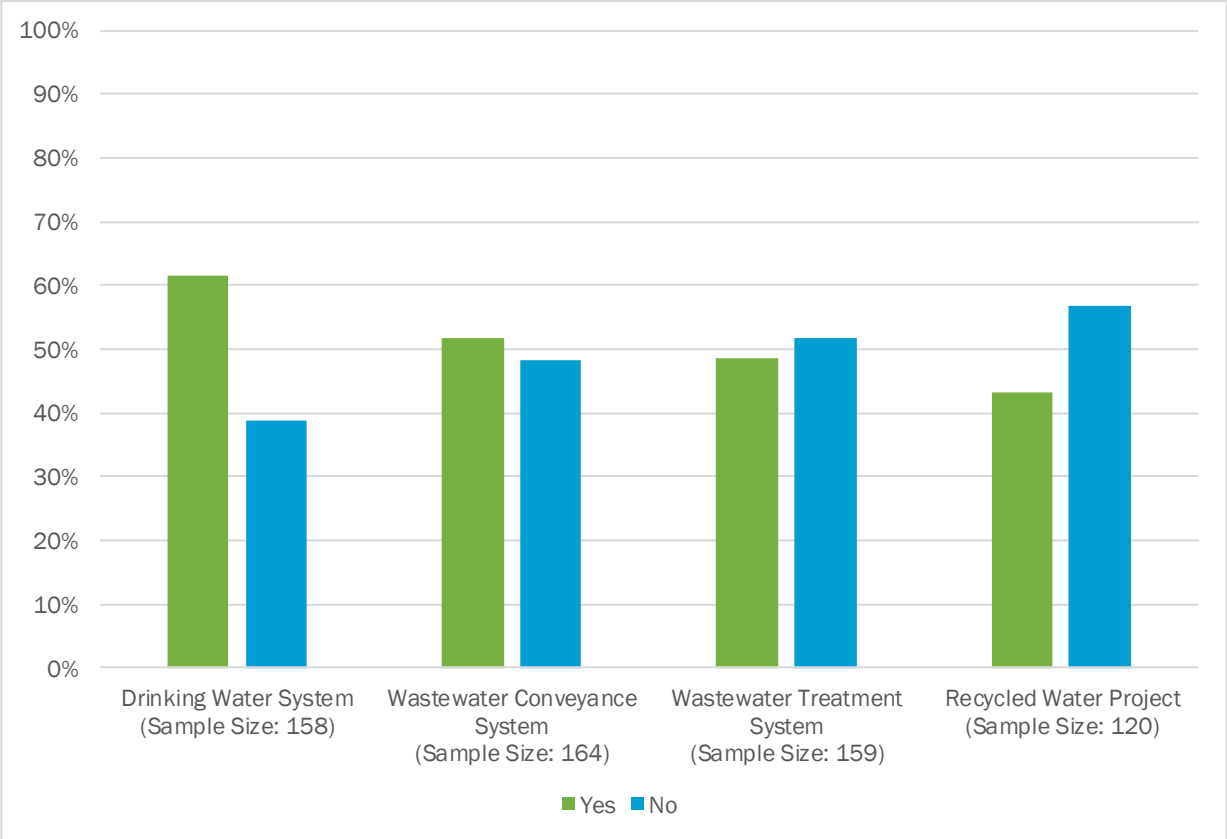


Figure 1-5. Survey respondents experienced impacts of water conservation in all system types.

Source: CUWA, 2017

The potential impacts identified in the CUWA white paper are summarized in Section 3. **The objective of this project is to build upon CUWA's research and leverage the City's historical data to better understand and quantify the potential impacts of declining flows within the context of the City's integrated plan for greater supply reliability.**

SECTION 2

The Methodology

This case study leverages 10 years of historical data to evaluate the potential impacts reduced flows may have on the City's interconnected systems within the context of its broader goals for water supply diversification and greater supply reliability. Two scenarios were evaluated—a baseline and reduced flow scenario—to assess projected impacts including financial, social, and environmental considerations.

2.1 Defining the Boundaries

The following boundaries were established for the case study:

- **Regional:** While the City services the entire San Diego area, this analysis focuses on the North City sewershed, which encompasses Phase 1 of the Pure Water Program. As such, modeling, designs, and demonstration testing within the area have been established. Any impacts experienced in the North City sewershed would therefore be extrapolated to the City's entire service area.
- **Time Frame:** To complete a comprehensive analysis, historical data was requested for the past 10 years. A smaller dataset was analyzed in some circumstances, such as the North City Advanced Purification Demonstration Facility, which was only brought online in 2010.

2.2 Defining Two Comparative Scenarios

The Baseline scenario represents existing conditions including implementation of the Pure Water Program as designed. The Reduced Flows scenario represents a theoretical situation where flows are dramatically reduced through a combination of WUE strategies and other consumer behavior adjustments such as greywater or decentralized reuse.

Baseline Scenario

The Baseline scenario consists of the design criteria established for Phase I of the Pure Water program. To support both non-potable reuse (NPR) and potable reuse customers, the City intends to use Phase I to produce 12 mgd of recycled water for NPR uses and 30 mgd of purified water for potable reuse. This scenario would require expansion of the North City Water Reclamation Plant (NCWRP), a new North City Pure Water Facility (NCPWF), a North City Pump Station and Pipeline to convey the purified water to Miramar Reservoir, and a new Morena Pump Station (MPS) and Pipeline to bring supplemental wastewater flows to the NCWRP (Figure 2-1).

Baseline

The Baseline scenario will be the design criteria established for the Pure Water Program, which includes an R-gpcd starting at 55 and reducing to 52 gpcd by 2035.

Reduced Flows

The Reduced Flows scenario assumes an R-gpcd of 35 which considers intensified WUE strategies and other consumer behavior adjustments that will reduce the amount of flows into the wastewater system.

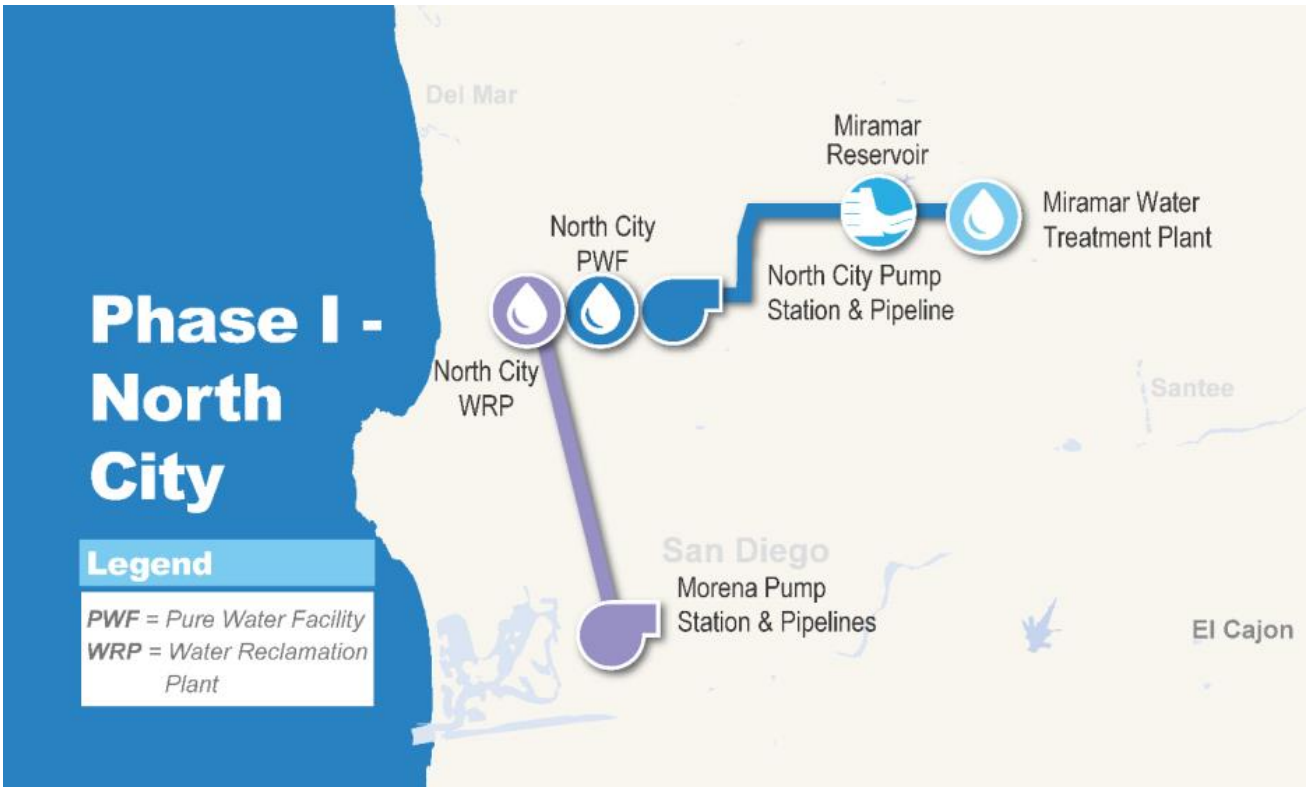


Figure 2-1. Phase I of the Pure Water Program consists of the NCWRP, NCPWF and MPS.

Source: City of San Diego, 2017b

The 42 mgd of effluent would require an influent of 52 mgd, as a portion of the water is returned from the wastewater and advanced water treatment process to the wastewater system. To appropriately size and locate Phase I facilities, design criteria were defined, which includes an expected R-gpcd value of 55 gpcd at 2015, declining to 52 gpcd by 2035. These values were calculated through modeling, outside of the scope of this case study, that considered historical wastewater volumes and population.

Reduced Flows Scenario

To understand the impacts of reduced flows, the comparative Reduced Flows scenario is defined with a significantly lower R-gpcd of 35, representing a combination of increasingly stringent WUE targets, greater adoption of grey water reuse, and potential implementation of decentralized or business-scale reuse systems.

These two scenarios represent bookends along a broad spectrum of potential realities. Evaluation of the two scenarios is intended to provide valuable, high-level insight into the potential impacts of reduced flows.

2.3 Evaluating Impacts through a Triple Bottom Line Context

To provide a holistic perspective, this case study examines each potential impact identified as part of the comparative analysis through a triple bottom line lens. This means that each impact is reviewed from an economic, environmental, and social perspective (Figure 2-2).

Figure 2-2. Each impact was reviewed through a triple bottom line context, which considers economic, environmental, and social perspectives.

Technical Approach

The analysis reviewed the City's wastewater collection system, wastewater treatment system, and advanced water treatment systems, and consisted of three key elements:

- **Potential Impacts:** As a companion piece to the CUWA white paper, potential impacts identified through that effort were leveraged as the starting point for this case study. Section 3 summarizes those potential impacts on wastewater conveyance, wastewater treatment, and recycled water systems.
- **City Analysis:** Data provided by City were analyzed to determine which impacts have been or could potentially be observed at baseline and reduced flow conditions. Section 4 of this report summarizes City-specific issues.
- **Triple Bottom Line Assessment:** Impacts identified for the City are categorized in Section 5 as quantifiable impacts (economic) and qualitative impacts (environmental and social).

2.4 Limitations of the Analysis

This high-level assessment consists of reviewing pertinent datasets that might demonstrate the potential impacts identified through CUWA's research (Section 3) on wastewater conveyance, wastewater treatment, and recycled water systems. It's important to highlight the limitations of this assessment, as it draws upon correlation to identify impacts caused by declining flows. Correlation does not equal causation. However, for the sake of this high-level assessment, the correlations that appear will be leveraged and quantified (as appropriate) to provide an order of magnitude perspective on the potential social, environmental, and economic impacts of declining flows.

SECTION 3

Impacts of Declining Flows on the Urban Water Cycle

CUWA's white paper on *Adapting to Change: Declining Flows and Utility Systems* (CUWA, 2017) researched the potential impacts of declining flows on the interconnected water systems, including drinking water distribution, wastewater conveyance, wastewater treatment, and recycled water projects.

3.1 Declining Flows Impact all Areas of the Urban Water Cycle

The CUWA white paper reviewed the impacts of declining flows on the water, wastewater, and recycled water systems (Figure 3-1). While impacts to the drinking water distribution system in San Diego due to declining flows have been observed, this analysis focuses on the wastewater conveyance, treatment, and recycled water systems within the North City sewershed.

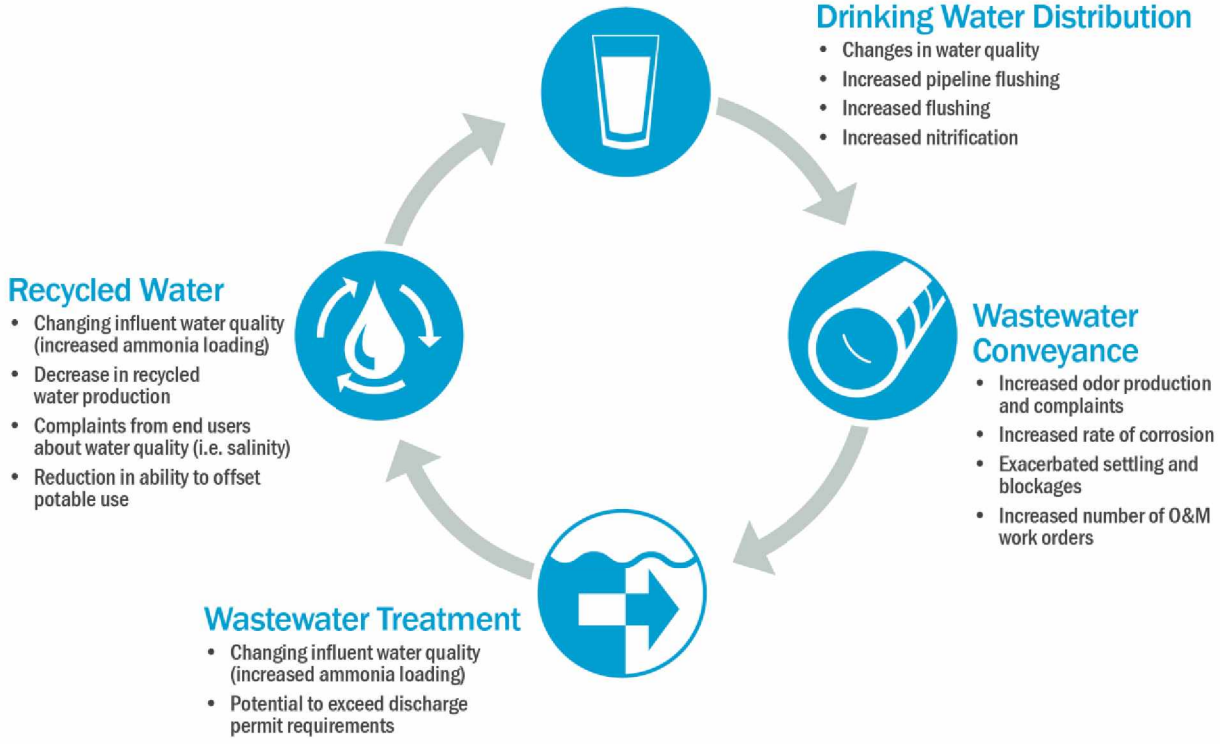


Figure 3-1. Declining flows in the urban water cycle can potentially impact all areas of the cycle.

Source: CUWA 2017

3.2 Impacts on Wastewater Conveyance Systems

The changing characteristics of wastewater from declining flows can impact odor production and corrosion through two methods:

- **Increased concentration of solids and organic material.** As wastewater flows decrease and organic and solids concentrations increase because of conservation, sulfide generation in sewage increase. This increase in sulfides, like hydrogen sulfide (H_2S), results in increased foul air emissions and sewer blockages.
- **Increased residence time.** Low flow in pipes also means a longer residence time, giving more time for the microbes in wastewater to consume oxygen, leading to anaerobic conditions. Increased residence time allows more sulfides to be produced, increasing the likelihood of foul air emissions and nuisance complaints.

These increases in H_2S exacerbates foul odor production and the rate of corrosion in unlined metal and reinforced concrete pipe.

What changes with lower R-GPCD?

Increased solids concentration in wastewater leads to increased generation of H_2S.

What are the potential impacts?

Higher solids and H_2S concentrations can increase foul odor production, accelerate the rate of corrosion, and exacerbate blockages.

Increased Odor Production

Odors in sewers are dominated by reduced sulfur species like H_2S, which is easily recognizable by its characteristic rotten egg odor. H_2S is a product of biochemical reduction of sulfate. As sulfide concentrations in the wastewater increase, bad sewer odors increase.

This impact would be particularly exacerbated in areas where there are long stretches of pipelines and manholes. Increased odor production would generate additional bad sewer odor work orders, which would require additional operations and maintenance (O&M) labor to address. Increase odors would also potentially require an increase in the purchase and use of odor mitigation chemicals, like Bioxide® (i.e., calcium nitrate) or iron chloride.

Accelerated Rate of Corrosion in Sewer Pipes

Corrosion in the conveyance system occurs when the free water surface releases H_2S to the atmosphere during anaerobic conditions and is adsorbed by moist sewer pipe. On the pipe surface, H_2S is converted to sulfuric acid, which corrodes unlined pipes. Accelerated corrosion in unlined pipes leads to a faster rate of structural failure. The primary failure mode for metal pipes is internal or external corrosion, which leads to holes in the pipe wall. Cast iron is particularly brittle, making it susceptible to cracking and subsequent collapse. Corrosion is also often the major factor in the failure of unlined reinforced concrete pipe (RCP), which typically fails after the interior surface of the pipe wall has deteriorated to a point where the reinforcing steel is exposed (Feeny et al., 2009).

This increase in the rate of structural failure because of accelerated corrosion corresponds with an increase in capital and O&M costs. There are strategies to mitigate the impacts of corrosion, such as lining RCP with a plastic liner. However, this lining also requires an economic investment.

Exacerbating Sanitary Sewer Overflows and Blockages

Standards used for hydraulic design include requirements of minimum slopes for various pipe diameters to achieve scouring velocities that minimize debris accumulation. However, conditions could exacerbate debris accumulation, including root intrusion; increase in fats, oils, and grease; and pipe sags (Feeney et al., 2009). This debris accumulation results in sanitary sewer blockages (SSBs), the number one cause of loss in sewer serviceability (Ashley, 2004).

Increased solids concentration in wastewater can potentially exacerbate sanitary sewer overflow (SSO) and blockages in the wastewater conveyance system. A study conducted by a water retailer in Australia correlated water consumption per household with the number of SSBs (Figure 3-2), indicating that lower water consumption gives rise to a higher rate of SSBs (Yarra Valley Water, 2011). This subsequently leads to clogged pipes, loss of sewer serviceability, and an increase in O&M.

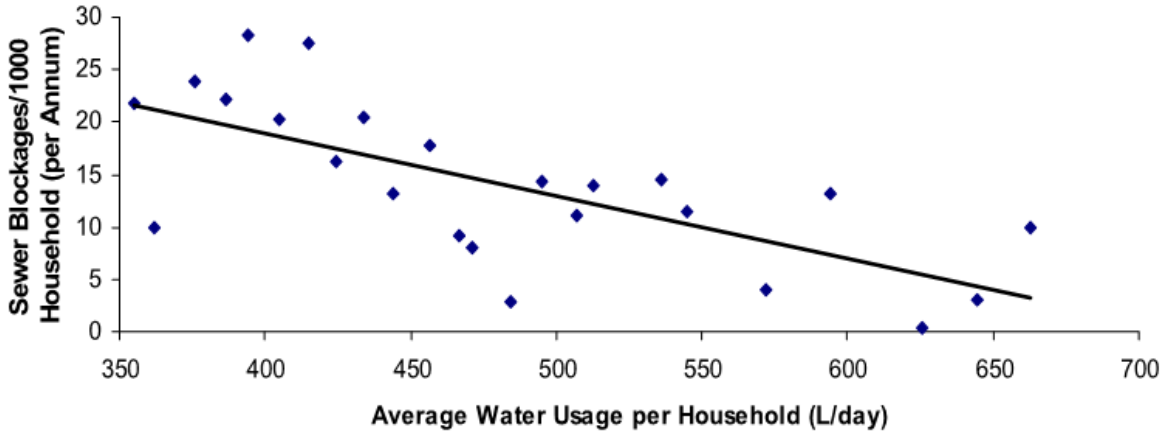


Figure 3-2. Lower water consumption gives rise to a higher rate of sewer blockages.

Source: Yarra Valley Water, 2011

3.3 Impacts of Reduced Flows on Wastewater Treatment

Declining flows in the wastewater system has two impacts on wastewater treatment plants. First, the amount of flow going into the plant is reduced. Second, the concentrations of contaminants increase in the influent wastewater at treatment plants.

Wastewater Influent Concentrations May Impact Effluent Quality

Increasing wastewater contaminant concentrations stress treatment processes as the amount of ammonia, total suspended solids (TSS), total dissolved solids (TDS), and organics (measured as biological oxygen demand [BOD]) increases beyond design specifications. This may potentially impact a plant's ability to meet discharge permit requirements and require wastewater treatment plants to invest in improvements or expansions earlier than planned. Higher loads may also require higher flows and greater volumes of chemicals for treatment.

Reduction of Source Wastewater Flows

Wastewater treatment plant effluent can also potentially be used to produce recycled water to meet project demands. For recycled water projects that have committed to a certain volume of recycled water effluent, a reduction in wastewater can impact those commitments.

What changes with declining flows?

As water decreases in the collection systems, but solids mass remains the same, the concentration of solids in wastewater increases. This leads to lower, more concentrated, flows of wastewater into the wastewater treatment plants.

What are the potential impacts?

- Increase of contaminant concentrations in influent wastewater, including BOD and TSS, which could strain treatment processes.
- Reduction of influent flows into wastewater treatment plants.

3.4 Impacts of Decreased Flows on Advanced Water Treatment

To expand water reuse statewide, utilities are designing and constructing new infrastructure to treat and distribute purified water. Declining flows can alter the treatment and cost-effectiveness of the recycled water infrastructure by altering factors considered in system design, like anticipated flow and water quality. Thus, declining flows could lead to underused community assets and limit the agencies' ability to meet state water reuse goals.

Changes in Wastewater Effluent can have Impacts on Recycled Water Quantity and Quality

Declining flows can result in the generation of a more concentrated wastewater stream, with elevated concentrations of TDS, nitrogen species, and carbon (Stevens, 2015). A recently published paper explores how drought and water conservation strategies combine to reduce influent quality and flow, and subsequently, effluent quality and flow. Assuming that no changes in operations occurs, the analysis showed that an increase in pollutants at the influent of a wastewater treatment facility led to increases in certain constituents in the effluent, including TDS, electrical conductivity, ions, chloride, calcium, and nutrients (Tran et al., 2017).

What changes with declining flows?

As concentration of contaminants increase in wastewater influent, degraded effluent quality can result, and consequently impact advanced water treatment projects.

What are the potential impacts?

Increase of certain contaminants could potentially impact the effectiveness of treatment processes in the advanced water treatment train.

SECTION 4

Leveraging Historical Data to Identify Impacts in San Diego

Historical data and research conducted within the North City sewershed were analyzed to identify any impacts the City may have experienced due to declining flows observed over the past decade. These data sets encompassed impacts on the wastewater conveyance, wastewater treatment, and recycled water systems.

4.1 Impacts on the Wastewater Conveyance System

The City's Public Utilities Department – Wastewater Collection Division is responsible for the collection and conveyance of wastewater from residences and businesses throughout the City, which encompasses a 330 square-mile area with a population of 1.3 million people. Wastewater is collected and conveyed through approximately 2,900 miles of sewer lines, more than 250,000 sewer latteral connections to sewer lines, 84 municipal pump stations, and 62,700 manholes.

Declines in flow within the wastewater conveyance system can be quantified by reviewing influent flows at the wastewater treatment plants. The City currently operates three wastewater treatment plants to treat its wastewater: the NCWRP, the South Bay Water Reclamation Plant (SBWRP), and the Point Loma Wastewater Treatment Plant. Given that the NCWRP and SBWRP currently operate as scalping plants, influent flows at the PLTWP would be the most accurate representation of how wastewater flows have been historically changing (Figure 4-1). Even with the variability in influent flows, caused by wet weather events and changes in operation at the upstream NCWRP and SBWRP, a steady decline of influent wastewater flows is evident. From 2006 to 2017, influent flow has decreased by 24 percent.

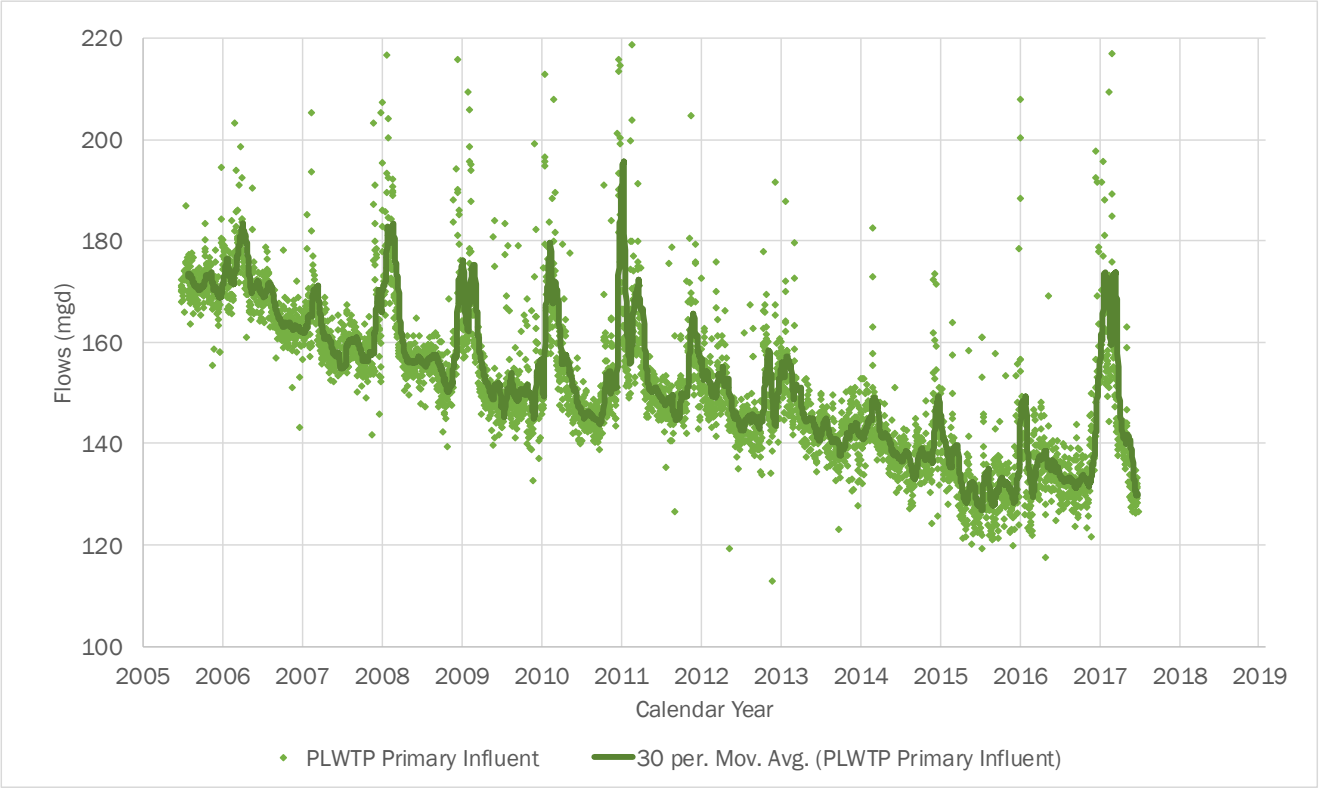


Figure 4-1. Influent flows at the Point Loma Wastewater Treatment Plant declined 24 percent from 2006 through 2017.

These correlate with the declining trends in gpcd, shown in Figure 4-2. Thus, understanding how reduced flows could impact the City's wastewater conveyance system is a critical consideration when developing a holistic water supply strategy.

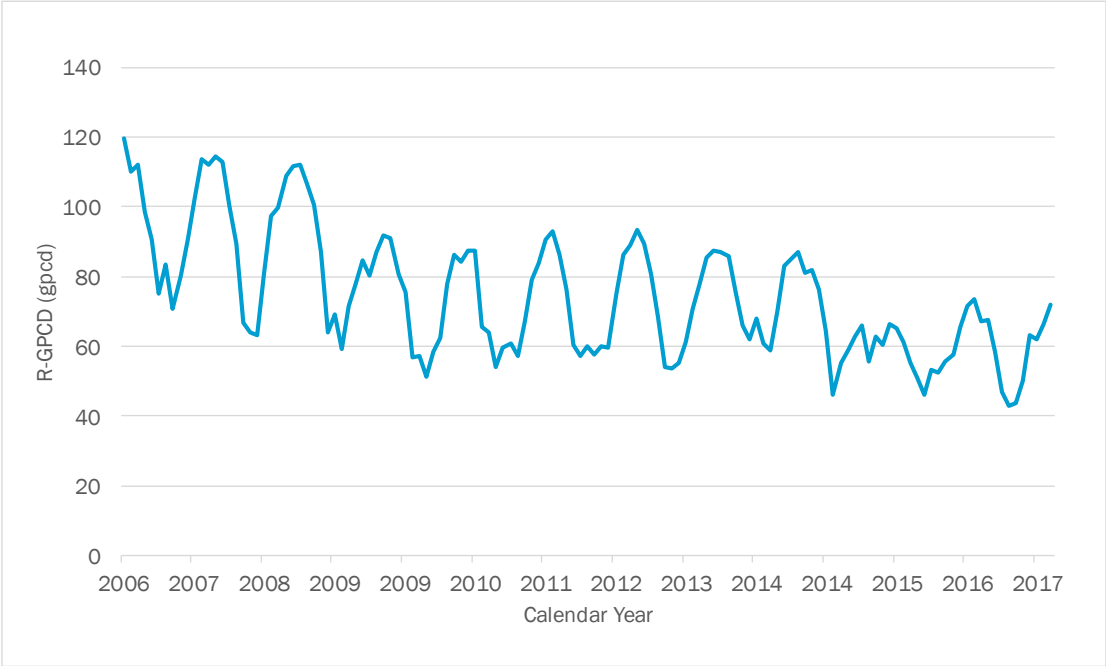


Figure 4-2. The City's R-gpcd has been steadily declining since 2006.

Gallons of Bioxide® Purchased Increase with Declining R-gpcd

Increased odor production may also impact the purchase and use of odor mitigation products, such as sodium hypochlorite *and* Bioxide®. These chemicals are trucked from a central supplier and injected directly into the wastewater conveyance system.

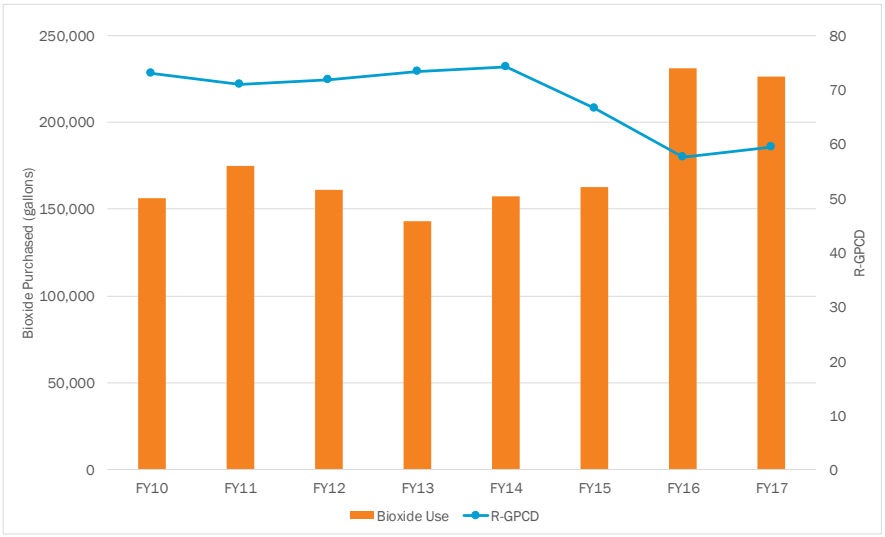


Figure 4-4. Increased Bioxide® purchases in fiscal years 2016 and 2017 triggered a more detailed analysis of Bioxide® purchase and use.

The purchase of various odor mitigation products during a fiscal year was assessed, including Bioxide®, impregnated carbon, and hypochlorite. The spike in Bioxide® purchase in fiscal years 2016 and 2017, shown in Figure 4-4, triggered a deeper evaluation of the details of Bioxide® use to determine whether this was a result of reduced system flow.

Additional information was requested from the City's Bioxide® vendor, Evoqua. They provided data listing each Bioxide® delivery and its volume from fiscal years 2008 to 2017 (Figure 4-5).

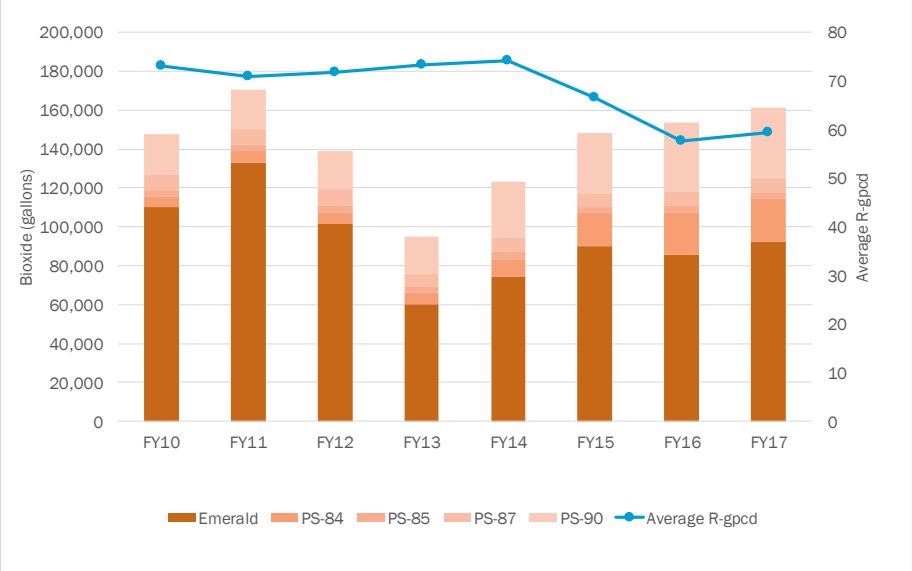


Figure 4-5. Increases in Bioxide® purchases (gallons) coincided with declines in R-gpcd.

Source: Data provided by Evoqua

To ensure that Bioxide® trends were being evaluated due to increased odor production, and not the City choosing to change odor mitigation methods for that injection point, only injection points that have consistently been using Bioxide® from fiscal years 2010 to 2017 were evaluated.

From the trends in R-gpcd and Bioxide® purchases, a correlation was developed that allowed for additional Bioxide® needed to be calculated. The resulting economic increase for the Reduced Flows scenario is presented in Section 5.

Report of Bad Sewer Odors Increase with Reduced Flows

Increased odor production may manifest as an increase in bad sewer odor (BSO) work orders. To determine whether reduced flows would increase BSO work orders, the number of BSO work orders from 2005 through 2018 were quantified and analyzed. As shown in Figure 4-3, the City's historical R-gpcd and quantity of BSO work orders received appears to have a slight inverse relationship.

Increased solids concentrations in pipes produce more H_2S, which generates more bad sewer odors.

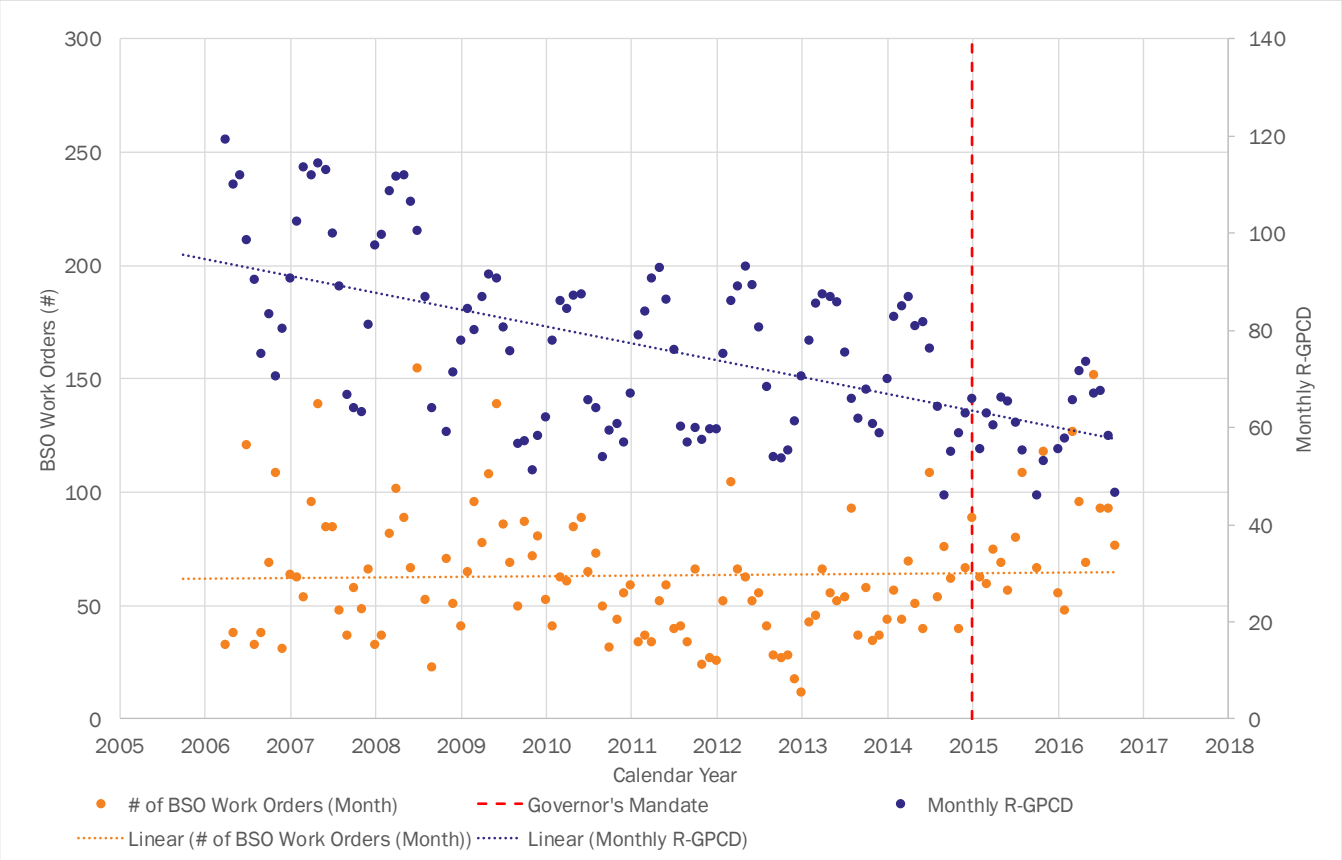


Figure 4-3. R-gpcd significantly reduced after the Governor's mandate, which was accompanied by an increase in BSO work orders.

However, after digging deeper into the R-gpcd values and the number of BSO work orders, there was not a sufficient correlation. This may be because the BSO work orders are a product of odor complaints filed by the community, and other factors were likely mitigating any increases in odor. This could include operational strategies (sealing manhole covers) or increased use of odor managing-controlling chemicals like Bioxide® (which is discussed in the next section).

The data set reviewed indicates that there is no significant difference in BSO work orders between the Baseline and Reduced Flows scenarios, meaning no economic, environmental or social impacts.

Increased Greenhouse Gas Emissions from Increased Trucking

Increased Bioxide® use also leads to an increase in transport and delivery of the Bioxide®. The supplier, Evoqua, is in Temecula and the Bioxide® injection points are spread throughout the City (Figure 4-6). The average distance between Evoqua and the sampling sites is 30 miles.

To deliver Bioxide®, Evoqua used diesel trucks sized from 2,000 to 4,100 gallons. While there was an increase in Bioxide® use, there was the possibility that Evoqua merely compensated by increasing the size of their delivery truck. Thus, the frequency of deliveries per each fiscal year was reviewed to accurately gauge the greenhouse gas impacts (Figure 4-7).

Increased Bioxide® use coincides with an increase in the frequency of deliveries. An increase in the frequency of deliveries results in environmental and social impacts, which are discussed in Section 5.

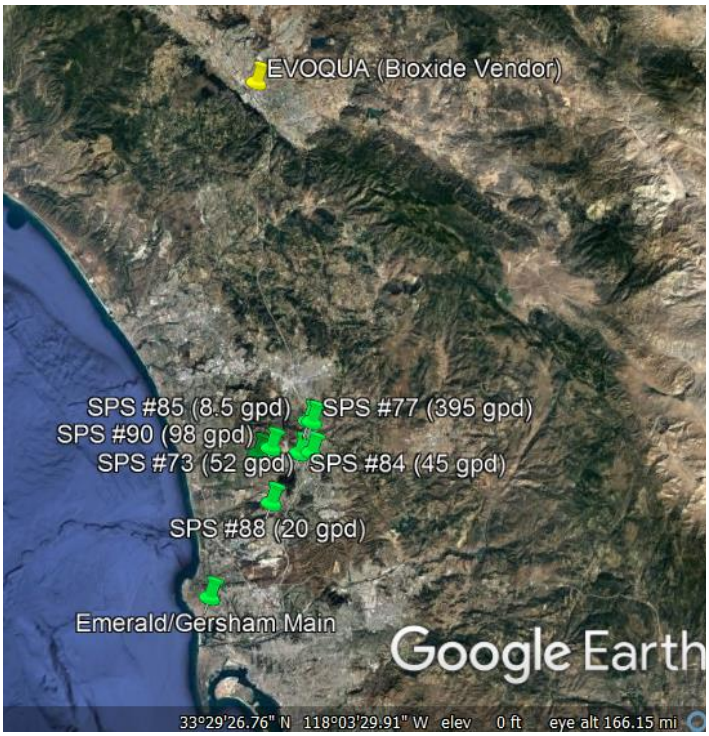


Figure 4-6. The average distance between the Bioxide® supplier (Evoqua) and injection sites is 30 miles.

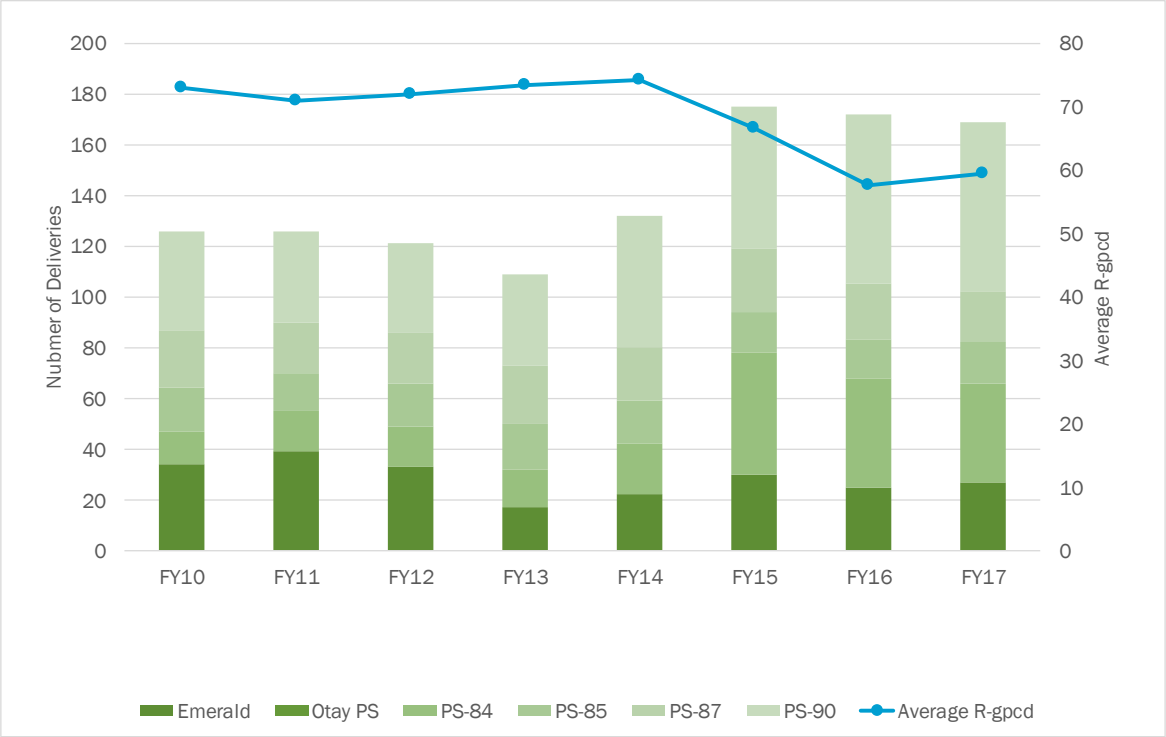


Figure 4-7. The frequency of Bioxide® deliveries increased with increased Bioxide® use at specified locations.

Source: Data provided by Evoqua

Corrosion Implications of Reduced Flows

Accelerated corrosion in pipes leads to a faster rate of structural failure. To evaluate whether the City's wastewater conveyance has been impacted by reduced flows, data for the replacement and rehabilitation of sewer lines were requested and analyzed (Figure 4-8).

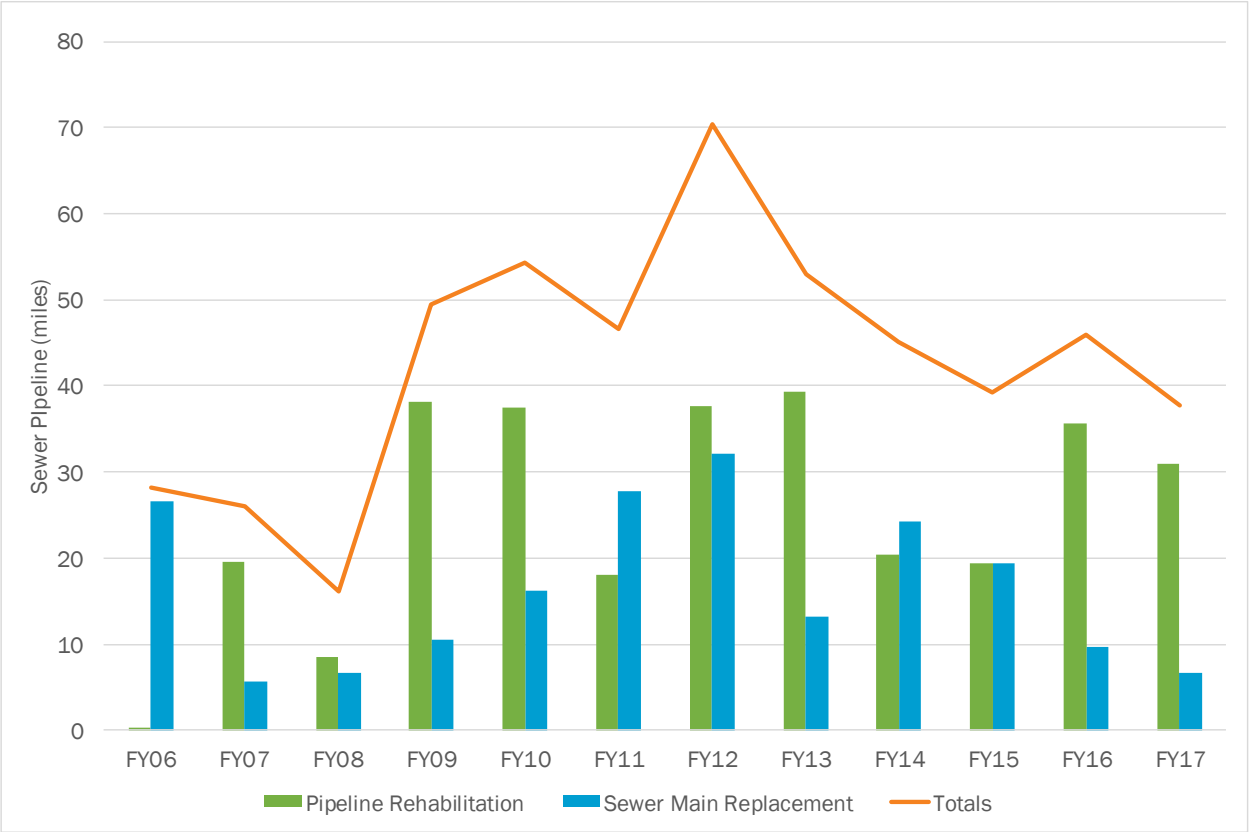


Figure 4-8. The pipeline rehabilitation and sewer main replacement rate appear to fluctuate per fiscal year.

Pipeline rehabilitation and sewer main replacement rates do not have a clear correlation to a reduction in flows. This is because these rates are more driven by the availability of funding and rehabilitation master plans. This is also expected as the impacts from an accelerated rate of corrosion are realized over longer time frames.

However, given the significant impact that accelerated corrosion can have, it is valuable to consider a theoretical impact through corrosion equations and modeling. The next section details a theoretical analysis of the potential impacts of accelerated corrosion.

Increases in H_2S Concentrations Accelerate the Rate of Corrosion

While the exact value of H_2S concentrations throughout the system is unknown, a range of potential economic impacts can be calculated. Per United States Environmental Protection Agency equations outlined in the *"Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants,"* the rate of corrosion specifically for RCP can be calculated as a function of H_2S concentrations, physical characteristics of the pipe, and flow:

$$C_{AVG} = \frac{11.5 k \varphi_{aw}}{A}$$

Where;
C_{AVG} = average rate of corrosion (mm/yr)
k = coefficient of efficiency (dimensionless)
A = alkalinity of cement (dimensionless)
φ_{aw} = flux of H_2S to the pipe wall (gm^2-hr)

$$\text{Where, } \varphi_{aw} = 0.69(su)^{\frac{3}{8}} j[DS]\left({}^{b}/_{P'}\right)$$

Where;
s = energy gradient (m/m)
u =stream velocity (m/s)
j = fraction of H_2S as a function of pH
[DS] = H_2S concentration (milligrams per liter [mg/L]))
b/p' = ratio of stream at surface to exposed perimeter of pipe water dimensionless)

When the same length of pipe is examined at a given pH, the rate of corrosion is linearly related to the rate of H_2S generation. **Thus, as H_2S increases, the rate of corrosion increases at the same rate.** This can be used to roughly estimate how the lifetime of a pipe could be reduced as a function of H_2S generation. As an example, if H_2S concentration in a pipe is increased by 10 percent due to reduced flows, the rate of corrosion is expected to accelerate by 10 percent and reduce the overall lifetime of the pipe by 10 percent. It should be noted that specific conditions, such as humidity and exposure to potential erosive forces, will impact the corrosion of pipes, i.e., not all pipes will corrode or experience material loss with the mere presence of H_2S.

Acceleration in the rate of corrosion would mostly impact unlined RCP pipe. However, the City has been proactively mitigating the impacts of corrosion and has no unlined RCP pipe left in its system. **Thus, most of this impact is going to be felt at concrete manhole structures. Manhole structures that are currently susceptible to corrosion would experience accelerated corrosion due to increasing H_2S concentrations in the Reduced Flows scenario. A reduction in the lifetime of the manhole would translate to a need for capital investment to rehabilitate the manhole earlier than estimated. The resulting economic, environmental, and social impacts are calculated and presented in Section 5.**

Impact on Sanitary Sewer Blockages

Declining flows in the wastewater conveyance system could exacerbate SSBs and SSOs. To determine whether the City had experienced increases in SSOs and SSBs, the number of SSOs and SSBs were analyzed. Research indicated that the City had already conducted a comprehensive analysis of sanitary sewer fills from 2000 through 2015. The research showed a drastic decrease in sanitary sewer spills, especially from 2001 to 2005 (Figure 4-9).

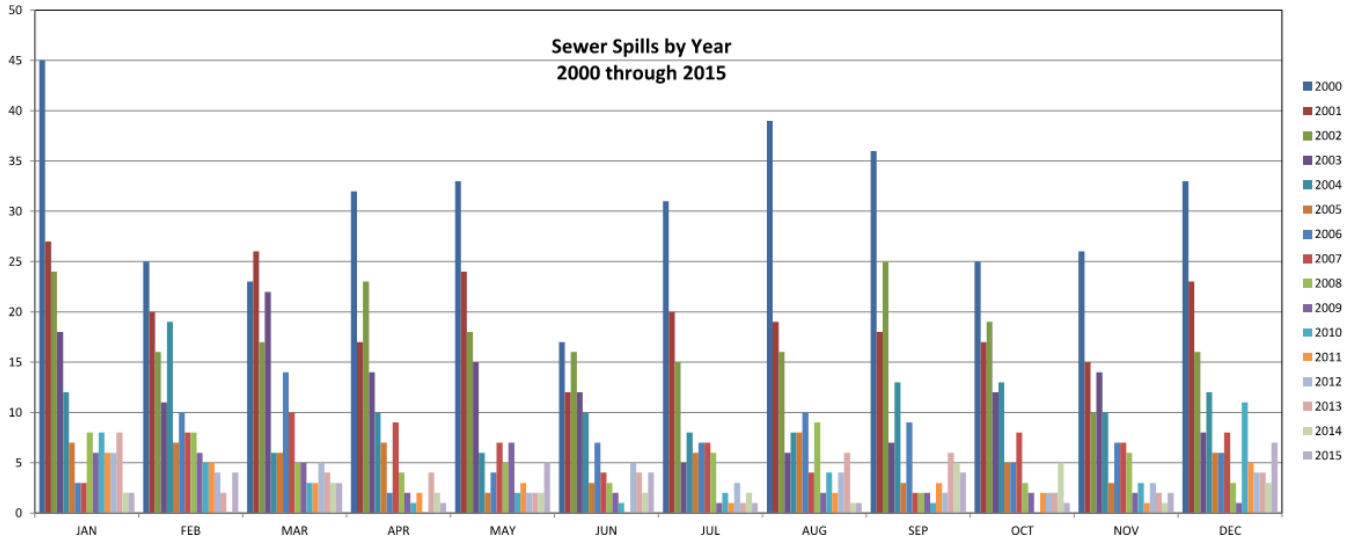


Figure 4-9. Sewer spills dropped drastically from 2000 to 2005 due to the City's aggressive Sewer Spill Reduction Program.

Source: City of San Diego, 2016

This decrease was due to the implementation of the City's aggressive Sewer Spill Reduction Program, initiated in 2001. This program consisted of cleaning all 3,000 miles of the conveyance system by 2004 and developing a systemwide cleaning schedule; televising and assessing the condition of more than 1,200 miles of the oldest and most problematic sewers; and increasing the number of miles of sewer lines replaced or rehabilitated from 15 miles per year to 45 miles per year. The program also has an educational component related to proper grease disposal, which mitigates potential blockages due to fats, oils, and grease.

Thus, the theoretical increase in the rate of SSB and SSOs experienced by the City is buffered by their comprehensive and continued maintenance. **Given the economic investment in the Sewer Spill Reduction Program would be the same in both the Baseline and Reduced Flows scenarios, there are no corresponding economic, environmental or social impacts.**

4.2 Impacts on the Wastewater Treatment System

The cornerstone of the North City sewershed is the NCWRP, which is designed to treat up to 30 mgd (on average) of wastewater. Portions of the wastewater processed through NCWRP are currently treated to Title 22 (California Code of Regulations [CCR]) Standards and distributed to reclaimed water customers through 79 miles of distribution pipelines. The customers then use the water for irrigation, landscaping, or industrial uses.

Phase I intends to expand the NCWRP and use its effluent as influent for the new NCPWF, which would treat the Title 22 water to purified recycled water quality, meeting if not exceeding drinking water standards. Changes to the wastewater influent flows or quantity can impact both the NCWRP expansion design and the MPS, the pump station built to bring supplemental flows to the NCWRP.

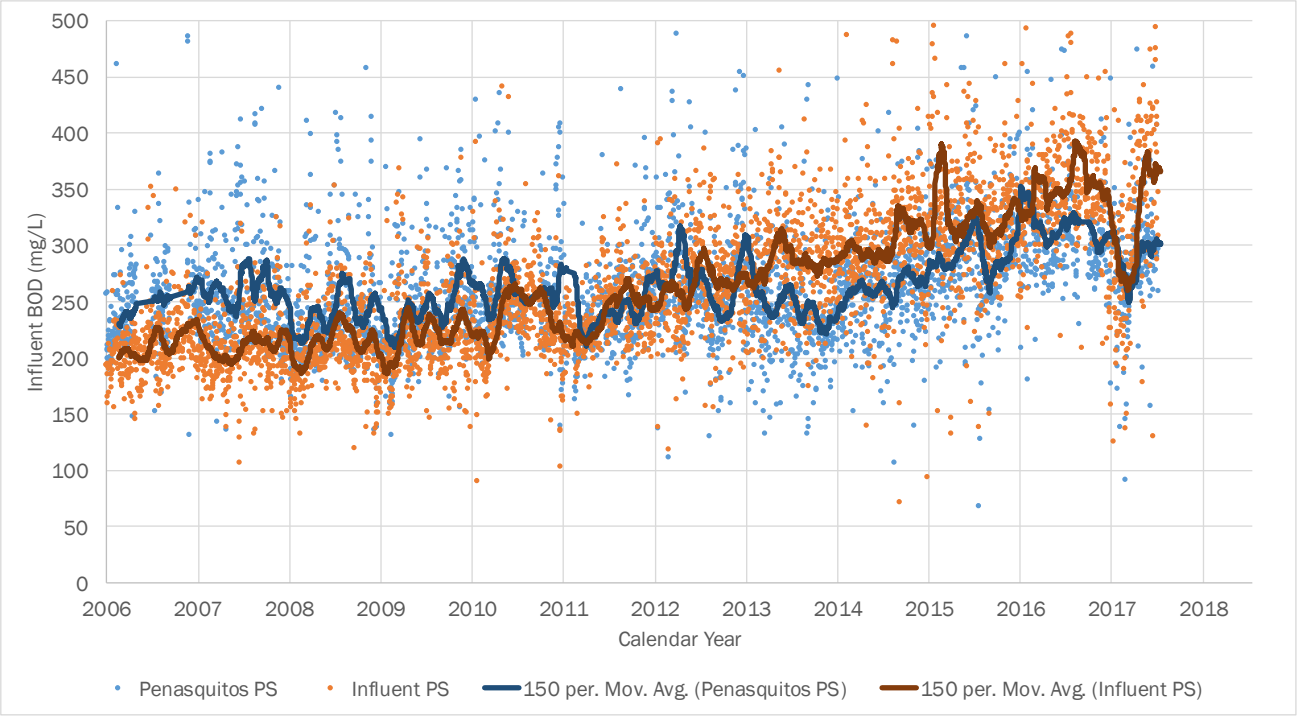
Given the City's current investment in the Pure Water San Diego Program, understanding the potential impacts of reduced flows on wastewater treatment is a critical consideration in developing a holistic water supply strategy.

Changing Wastewater Influent Quality at the NCWRP

As part of Phase I of the Pure Water San Diego Program, the City is currently designing an expansion of the NCWRP, which required establishing design criteria to properly size the treatment processes. However, declining flows can increase contaminant concentrations like BOD and TSS in the wastewater influent, and consequently increase mass loading of these parameters beyond the original design.

Increased pollutant concentrations have the potential to push influent wastewater quality beyond specified design criteria.

To understand how BOD and TSS may be increasing due to reduced flows, historical BOD and TSS concentrations were analyzed. BOD and TSS concentrations in the wastewater influent to the NCWRP have been steadily increasing over the last 10 years (Figure 4-10). From 2006 to 2017, BOD has increased from 200 mg/L to 300 mg/L, which represents a 50 percent increase. TSS has increased from an average of 230 mg/L to 350 mg/L, also representing a 50 percent increase.



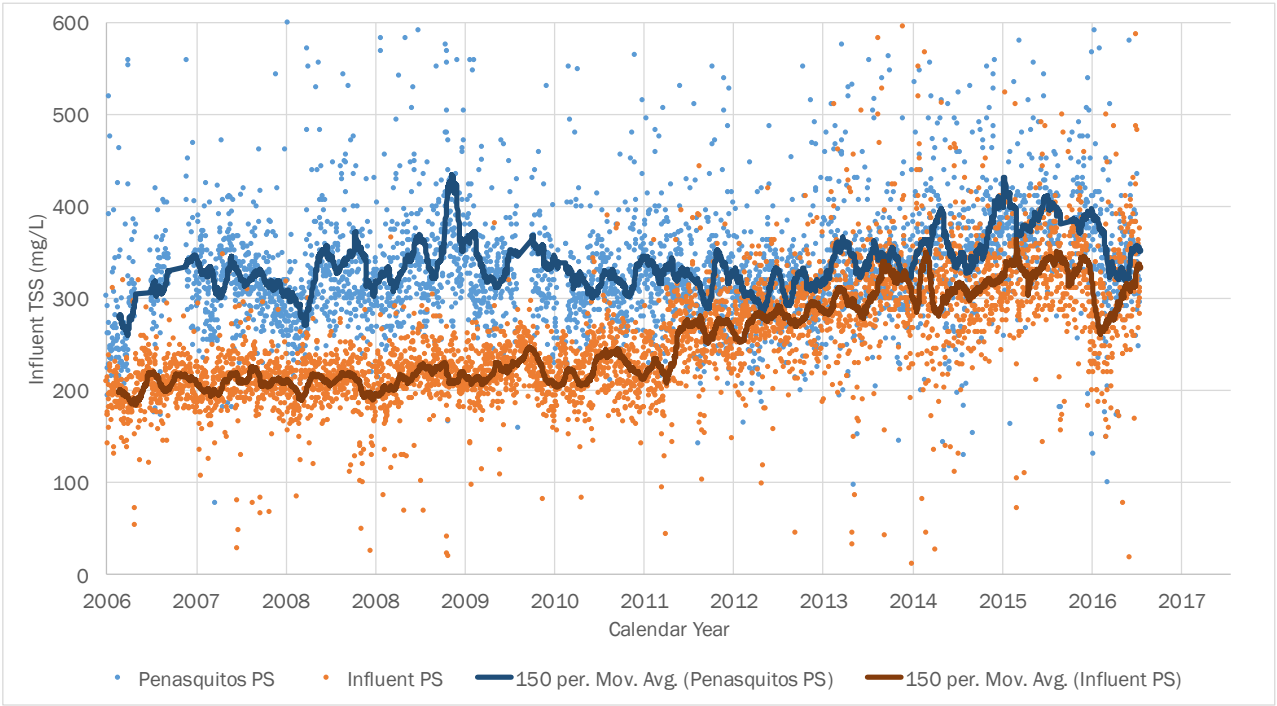


Figure 4-10. BOD (top) and TSS (bottom) concentrations have been increasing steadily in the primary influent at NCWRP since 2006.

The increase in TSS and BOD concentrations can be modeled by using R-gpcd assumptions for the Baseline and Reduced Flows scenarios and an assumed unit generation rate for TSS and BOD. The model considered the increase in TSS and BOD concentrations as flows declined. Given that the NCWRP would still need an influent flow of 52 mgd in both scenarios to produce the amount of recycled water needed, the mass loading in the Reduced Flows scenario is higher. The model concluded that by 2035, there would be a 17 percent increase in TSS and BOD loading (Table 4-1).

Table 4 1. Impact of Reduced R gpcd on TSS and BOD Concentrations

Item	Baseline	Reduced Flows	Ratio Base: Reduced Flows
Flow (mgd)	52	52	1:1
TSS			
Concentration (mg/L)	300	350	1:17
Load (lb/day)	131,300	154,200	1:17
BOD			
Concentration (mg/L)	270	320	1:19
Load (lb/day)	118,800	139,500	1:17

The increased TSS and BOD concentrations would potentially require changes in the NCWRP expansion design, especially for treatment processes like aeration basins and secondary clarifiers. The resulting economic, environmental, and social impacts are presented in Section 5.

Reductions in Flows Impacting the NCWRP

When considering water recycling, wastewater is reframed as a valuable source water.

The NCWRP currently receives flows from Pump Station 64 and the Penasquitos Pump Station. As part of Phase I of the Pure Water San Diego Program, the NCWRP is being expanded to supply 12 mgd of NPR and 30 mgd of purified water. This requires an influent flow of 52 mgd, which is more than the flows currently provided by its two existing pump stations. Thus, supplemental supply is intended to be pumped to the NCWRP by the new MPS, which was strategically located to access enough wastewater for the supplemental supply.

If flows in the wastewater conveyance system are reduced, the source wastewater that would be redirected to the MPS would also decline. Given that Phase I is committed to producing a total of 42 mgd of product water, the supplemental supply role that MPS plays is critical. If the MPS' source water is reduced, the NCWRP's ability to produce the 42 mgd would be impacted.

Flow projections for the Reduced Flows scenario, which assume a wastewater generation rate of 35-gpcd, indicate there would be a reduction of 6 mgd for the sewers that would feed the currently proposed MPS. This loss could be recovered through relocation of the MPS. **Projected flows for other sewers in the area that could possibly be accessed to generate adequate wastewater supply indicate that the MPS would have to be relocated 2 miles south.**

However, given the progress that the City has made in the design of the Pure Water Program, it is highly unlikely that the City would relocate the MPS. **Thus, the 6 mgd of water lost has value,** which can be quantified based on the cost of importing the same volume of water and an underutilized advanced water purification facility designed to produce more flow than would be available. **Both the relocation and the loss of the water result in economic, environmental, and social impacts, which are calculated and presented in Section 5.**

4.3 Analysis of the Data from the Pilot Advanced Water Purification Facility

As part of Phase I of the Pure Water San Diego Program, the City is investing in a new full-scale advanced water purification facility called the NCPWF, which would mimic the 1 mgd demonstration advanced water purification facility (AWPF) currently operating on the NCWRP site. The NCPWF will be using the same five-step water purification process including ozonation, biological activated carbon, membrane filtration, reverse osmosis (RO), and ultraviolet disinfection with advanced oxidation.

To evaluate whether reduced flows impacted the AWPF demonstration facility, various constituents in the RO system were analyzed. The constituents in question were TDS, TOC, total nitrogen (Total N), and conductivity. These constituents were chosen because they have the potential to increase with declining R-gpcd, and would have the most significant impact on capital and O&M investments. An increase in TDS, TOC, and Total N could lead to accelerated fouling on the RO membranes and a corresponding increase in pressure to push more concentrated influent through the RO membranes.

However, the data from the City's AWPF demonstration facility (Figure 4-11) illustrated that these constituents remained stable in the RO feed despite declining R-gpcd values.

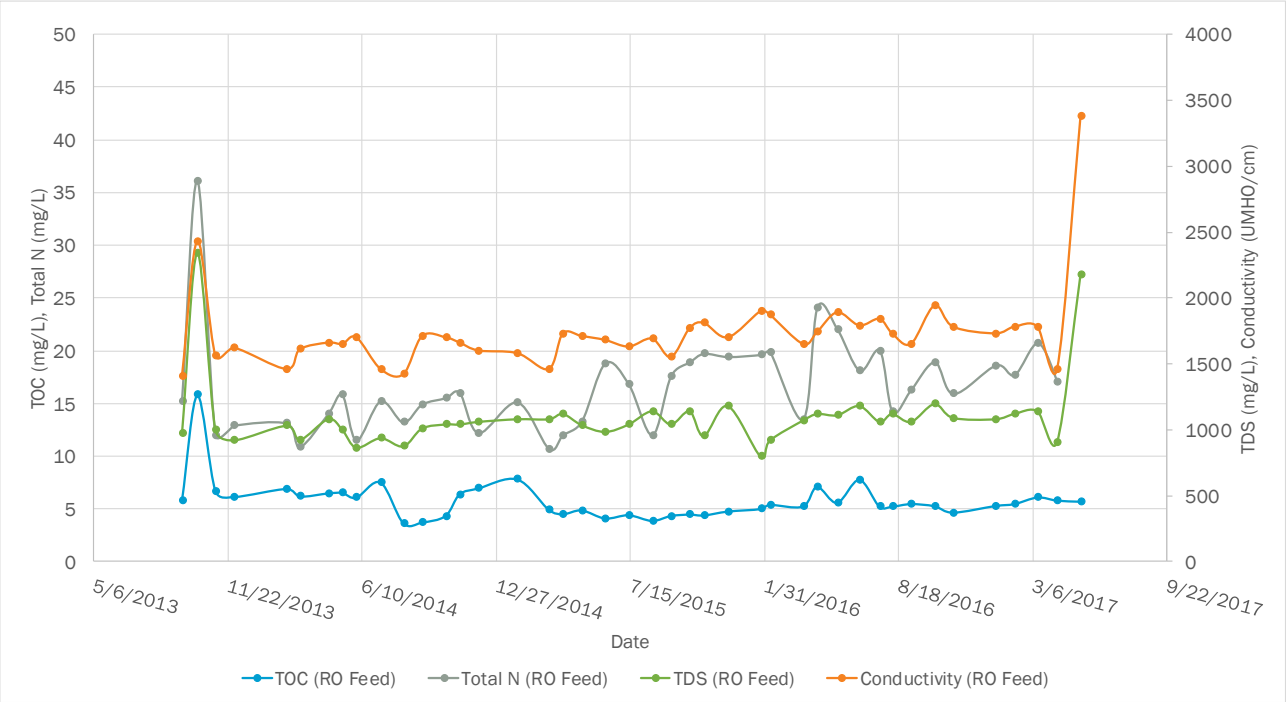


Figure 4-11. TDS, TOC, and Total N in the RO feed did not change despite declining R-gpcd values.

This speaks to the resiliency of the advanced water treatment train, and the upstream wastewater treatment process, as it can handle changes in influent quality. Thus, no impacts were identified for the City's advanced water treatment system.

While increased TDS concentrations were not observed in the RO feed water, research recently conducted by the Southern California Salinity Coalition (SCSC) and the National Water Research Institute reviewed the influence of source TDS and R-gpcd on influent wastewater TDS and presented conclusions that were pertinent to this study.

Influent TDS influenced by Source Water TDS and R-gpcd

The SCSC was founded in 2002 to "address the critical need to remove salt from water supplies and to preserve water resources in California". Given the complexities of factors that could influence the salinity of source waters and wastewater influent and effluent, the SCSC, in collaboration with National Water Research Institute, commissioned a study to analyze the effects that drought and conservation practices could have on the quality of recycled water (Stephens & Associates, 2017).

Using data provided by Eastern Municipal Water District, they conducted an analysis for influent wastewater TDS as a function of source TDS and R-gpcd. They calculated that the majority of influent wastewater TDS is influenced by source TDS, and some of it by R-gpcd (88 and 12 percent, respectively).

To quantify the influence of R-gpcd specifically, the researchers ran two statistical models from 2007 to 2016, one with the observed conservation (70 to 55 gpcd), and the other assuming no conservation (constant 70 gpcd). The statistical model with conservation showed a higher TDS concentration (blue) than the constant flow model (orange) (Figure 4-12), which translated into an increase of 1.7 mg/L of TDS for every 1.0 gpcd decrease in R-gpcd (assuming a constant source TDS).

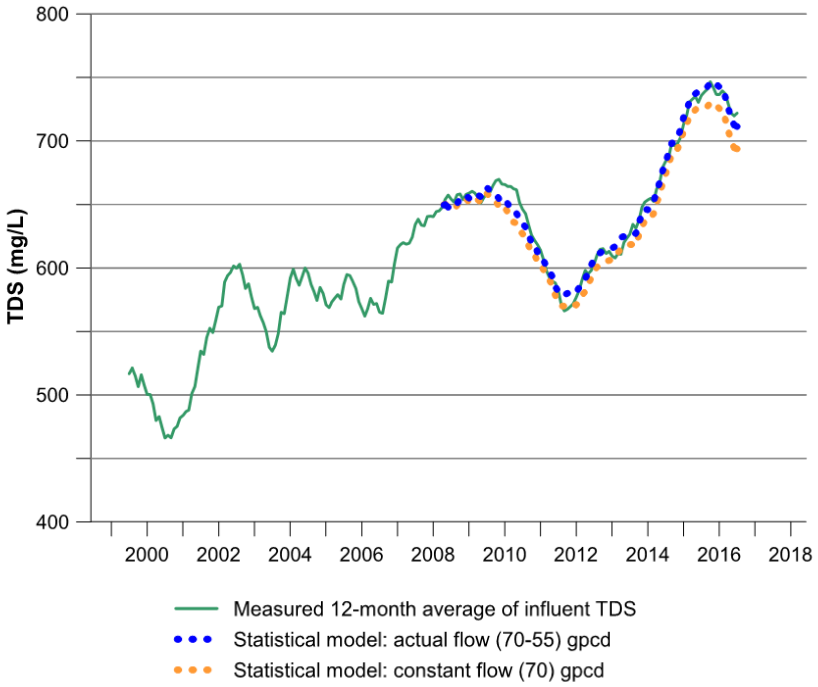


Figure 4-12. The statistical model assuming conservation (blue) predicted higher TDS concentrations.

Source: Stephens & Associates, 2017

It's important to note that this 1.7 mg/L increase is specific to Eastern Municipal Water District, and not directly transferrable to other utilities. For example, the researchers also conducted statistical models for Inland Empire Utilities Agency and their TDS to R-gpcd ratio was 1.2 mg/L of TDS increase to every 1 gpcd decrease in R-gpcd (Stephens & Associates, 2017).

There were still two major conclusions from this research that are pertinent to our study:

- **First, source TDS is a significant determiner of influent TDS**, and source TDS is more variable for agencies that import water, rather than using a local source. This is significant for utilities, like the City, who import from the Colorado River Aqueduct, as it tends to have higher concentrations of TDS.
  - This is relevant to the City, as the Pure Water Program is developing a local water source, which reduces their reliance on imported water. **This subsequently reduces their sensitivity to source water changes and its associated TDS changes, which has environmental benefits (discussed further in Section 5.2).**
- **Next, R-gpcd does have an impact on influent TDS concentrations.**
  - While the 1.7 mg/L is not directly transferrable to the City, it's critical to be aware that declining R-gpcd will have some impact on influent TDS which ultimately impacts recycled water quality and its use for irrigation or industrial reuse practices.

SECTION 5

Economic, Environmental, and Social Impacts of Reduced Flows

The economic impacts associated with the Baseline and Reduced Flow scenarios are calculated as a net present value (NPV). Environmental and social impacts were also considered as part of a holistic analysis of the interconnected water system.

5.1 Economic Impacts

The economic impact of reduced flows is quantified by the comparative difference between the Baseline scenario and the Reduced Flows scenario. For this economic analysis, costs for the Baseline scenario serve as the baseline; therefore, there are **no** economic impacts beyond current capital improvement plan and O&M budgets. The economic impacts of the Reduced Flows scenario are only the costs **in excess of** the baseline costs.

Limitations of the Economic Analysis

This section presents the assumptions and calculations used to quantify an annual cost and NPV for items that had economic implications as identified in Section 4. It should be noted that the calculations herein are based on correlation and theoretical assumptions. The goal of quantifying these economic impacts is to provide an order of magnitude perspective on the potential impacts that declining flows can have on the City's infrastructure.

Impacts on Wastewater Conveyance

The economic impacts of the Reduced Flows scenario identified for wastewater conveyance include an increase in the purchase of odor mitigation products and accelerated spending to address an increase in the rate of corrosion.

Increase in Odor Mitigation Products

While the City uses various odor mitigation products, Bioxide® was selected as the surrogate product for this case study. Using the data presented in Section 4, a correlation was developed between R-gpcd and Bioxide® purchase. This correlation was calculated to be:

$$bioxide\ use\ (gallons) = -2800 * (Rgpcd) + 404{,}000$$

Using this correlation, the gallons of Bioxide® needed to be purchased was calculated for the Baseline and Reduced Flows scenarios. Using the City's unit cost of $2.15 per gallon, the difference resulted in an annual increase of **$125,000 per year of additional Bioxide® purchases** for the Reduced Flows scenario.

Accelerated Rate of Corrosion Requiring an Accelerated Rate of O&M

As introduced in Section 4, the economic impacts of an accelerated rate of corrosion could be theoretically quantified by using equations that relate increasing levels of BOD to H_2S, and using increasing H_2S levels to calculate the acceleration in the rate of corrosion. This acceleration would then be applied to concrete manhole structures experiencing corrosion that the City currently owns and maintains.

To calculate this economic impact, the percent increase of H_2S must first be calculated for the Reduced Flows scenario. By using Pomeroy's equation (EPA 1985), an increase in H_2S can be correlated to an increased BOD:

$$S_2 = S_1 + (M)(t)[EBOD * \frac{D}{4} + 1.57]$$

Where;
S_2 = predicted sulfide concentration at time t_2 (mg/L)
S_1 = sulfide concentration at time t_1 (mg/L)
$t = t_2 - t_1$ = flow time in a given sewer reach with constant slope, diameter, and flow (hour)
M = specific sulfide flux coefficient (m/hr)
EBOD = concentration of BOD (mg/L)
D = pipe diameter (feet)

Assuming S_1 is zero, S_2 becomes a function of detention time and BOD concentrations. By using projected flows and BOD values provided by the City, the increase in H_2S concentrations can be calculated for the Reduced Flows scenario. Based on the relationship provided by Pomeroy's equation, **a 160 percent increase in H_2S concentrations would be observed by 2035 in the Reduced Flows scenario**. Using the linear relationship developed in Section 4, this would translate to a **160 percent increase in the rate of corrosion.**

This 160 percent increase would have an economic impact on the City by theoretically reducing the lifetime of manhole structures by 160 percent. However, it's important to note that only manholes with specific characteristics would be impacted by an accelerated rate of corrosion. These are manholes that are downstream of pump stations, have a decline in upstream and downstream slope, or contain converging flows. Specific conditions, such as humidity, could also impact corrosion. To appropriately estimate the economic impact, the accelerated rate of corrosion was only applied to manholes with these characteristics, referred herein as "impacted manholes".

To quantify the impacted manholes, the City provided a dataset of manhole condition assessments. Given that the City has not yet conducted a condition assessment on all the manholes in their system, this data set was leveraged as a sampling size to be extrapolated to the entire system. The percentage of "impacted manholes" would be developed from the sampling size, and then applied to the entire system to calculate the total number of impacted manholes.

Determining the percentage of impacted manholes from the sampling size data set. To determine how many manholes would be subject to an accelerated rate of corrosion, the condition assessment data was filtered to only include manholes that are currently experiencing corrosion. (This excluded "corroding steps", as they corrode regardless of the manhole characteristics described above.) From the provided data set, **2.1 percent** of the City's manholes were experiencing corrosion from their latest condition assessment. It's important to highlight this 2.1 percent represents the minimum number of impacted manholes, and that there may be manholes that would experience accelerated corrosion that aren't captured in the 2.1 percent. Thus, the cost estimate developed around the 2.1 percent is the minimum economic impact on the City.

Extrapolating the 2.1 percent to the entire City's entire system. Using GIS data from February 2015, there is an estimated 62,700 total manholes in the system. Per the City, roughly 1,900 manholes have already been rehabbed, replaced, or repaired. If these manholes have been rehabbed, replaced, or repaired with a method that mitigates corrosion, that reduces the total manhole count to 60,800. 2.1 percent of 60,800 means roughly 1,300 manholes would be subject to an accelerated rate of corrosion. Once again, these 1,300 manholes represent the minimum number of manholes in the system that would be impacted by accelerated corrosion.

Calculating the total cost to rehabilitate the 1,300 manholes. To address the 1,300 manholes that would experience accelerated corrosion, the City would need to invest money to rehabilitate these manholes earlier than anticipated. Assuming an average riser depth of 9 feet, a unit cost of $3,400 was developed, covering rehabilitation of the riser, bench, and trough. 1,300 manholes at $3,400 per manhole would mean the City would need to spend roughly $4,420,000 to rehabilitate all the "impacted manholes". A 20 percent contingency was then added to the $4,420,000 to cover frame and cover replacements (not included in the unit cost), as well as any operational procedures that could exacerbate the rate of corrosion. For example, the City sometimes uses a silicone sealant on manhole covers to mitigate odors, but that exacerbates the rate of the corrosion. Thus, the total cost to mitigate the accelerated corrosion is $5,300,000.

It's important to note that this total cost assumes that the method of rehabilitation would prevent any future impacts of accelerated corrosion for that manhole.

Calculating a cost per year to rehabilitate the impacted manholes for the Baseline scenario. The total cost of manhole rehabilitation would not differ between the Baseline and Reduced Flows scenarios, because manhole rehabilitation is an investment the City is already planning to make in the next 10-15 years. However, the accelerated rate of corrosion would require the City to address the impacts of corrosion much earlier than anticipated. Per the City, the average number of manholes/year that the City has rehabbed, replaced, or repaired is roughly 120 manholes/year. Assuming the same rate, the City would need 11 years to rehabilitate the remaining 1,300 manholes. Thus, the $5,300,000 over 11 years would equate to $482,000 per year through 2028 for the Baseline scenario.

Calculating a cost per year to rehabilitate the "impacted manholes" for the Reduced Flows scenario. In the reduced flows scenario, the 160 percent increase in the rate of corrosion would require the City to reduce the lifetime of manholes by 160 percent. That would require the City to address the "impacted manholes" in 4 years (through 2021), as opposed to 11 causing the annual cost to increase to $1,330,000 per year through 2021 for the Reduced Flows scenario.

The economic impact of accelerated corrosion is the required increase in investment per year (minimum $850,000 per year) to address corroding manholes over 4 years rather than 11.

What is the economic impact? The other economic impacts discussed within this report have been included in an NPV analysis through 2035. However, given that the total $5,300,000 for both the Baseline and Reduced Flows scenario is required before 2035, the economic impact for accelerated corrosion isn't best demonstrated in NPV. (The NPV difference between the two scenarios, specifically for corrosion, is ~$270,000 through 2035.) **The significance of the economic impact is the increased investment required (at least $850,000 per year) by the City in the first 4 years to address accelerated corrosion.** Given that the budget for the Public Utilities Department is determined per fiscal year, the City would have to increase their budget for manhole rehabilitation to address accelerated corrosion.

Impacts on Wastewater Treatment

The economic impacts of the Reduced Flows scenario identified for wastewater treatment, namely the NCWRP, include increased NCWRP expansion costs, a reduction of 6 mgd at the MPS location, and a theoretical location of the MPS to capture adequate supplemental flows.

Increase in Capital Costs for the NCWRP Expansion

The analysis in Section 4 resulted in an increase in TSS and BOD concentrations of 17 percent for the Reduced Flows scenario. This would impact treatment processes sized accordingly to mass loading, such as secondary clarifiers and aeration basins. The economic impact was thus quantified by increasing the capital costs of the secondary clarifiers and aeration basins of the existing NCWRP design by 17 percent. Using the 10 percent cost estimate developed for the NCWRP expansion, a 17 percent increase results in a one-time capital cost increase of **$8.6 million** for the Reduced Flows scenario.

Theoretical Costs to Relocate the MPS

Reduced flows in the system could potentially require relocation of the MPS to ensure access to enough wastewater to provide the necessary supplemental flows at the NCWRP. Projected flows for other sewers in the area that could possibly be accessed to generate adequate wastewater supply indicate that the MPS would have to be relocated 2 miles south. This relocation would present a significant capital cost investment as it would require crossing of the San Diego River. The San Diego River is 100 feet deep at the location of the identified crossing; thus, the tunneling would require deep launching and receiving pits.

Unit costs for tunneling were derived from the MPS—10 percent Cost Estimate (MWH 2016), which translated into a tunneling cost of $3 million. An additional 2 miles of pipeline would also be required, which—using the same MPS 10 percent Cost Estimate—would cost $12.7 million. The additional 2 miles would also generate more head loss, increasing the cost to run the mechanical and electrical components of the pump station. Beyond the physical infrastructure, redesign of the pump station, with additional permitting costs, would also be required. Table 5-1 provides a high-level estimate of these potential costs.

Table 5 1. Cost to Relocate the Morena Pump Station

Component	Cost
Pipeline	$13,000,000
Tunneling	$3,000,000
Mechanical & Electrical	$300,000
Soft Costs (28%)	$4,500,000
Total Capital Costs	**$20,500,000**
Annual Increase in Electrical Costs	**$50,000**

Value of the Lost 6 MGD

Given that the MPS is already being designed, it is unlikely that the MPS would be relocated. Thus, the reduction of 6 mgd of wastewater source water is also considered as an economic impact. This impact is quantified by calculating the annual cost of importing the same volume of untreated water. Some water is lost through the recycled water treatment process, and 70 percent of the wastewater influent becomes recycled water effluent. Thus, a reduction of 6 mgd of wastewater source water would result in a reduction of 4.2 mgd of purified water.

A constant 4.8 mgd would equate to a loss of 4,700 acre-feet of raw water per year. Using the San Diego County Water Authority's 2017 rates for untreated delivered water, that would equate to a value of **$4,500,000 per year.** This reduced production would also have social and environmental implications, as it would undermine the City's commitments to purified water production.

NPV Analysis of All Economic Impacts

Each of the economic impacts was imported into an NPV calculation to quantify cumulative impacts from 2017 through 2035. An escalation rate of 2.5 percent and a discount rate of 4 percent was assumed, which are consistent with the values used for the Pure Water Program. Table 5-2 summarizes these impacts.

Table 5 2. Economic Impacts of the Reduced Flow Scenario

Economic Impa	Value	One-Time Cost or Annual for NPV
Wastewater Conveyance		
Increase in Bioxide® Purchases	$125,000	Annual
Accelerated Investment due to Corrosion	An increase of $850,000 per year for four years. (See discussion above.)	Not Included in NPV
Wastewater Treatment		
Increase in NCWRP Expansion	$8,600,000	One-Time
Relocation of the MPS (Capital)	$20,500,000	One-Time
Relocation of the MPS (Operations)	$50,000	Annual
Value of the lost 6 mgd	$4,500,000	Annual
NPV Total	**($102,00,000)**	

It's important to note that while there are these economic impacts due to declining flows, there are also economic benefits. For example, there could be reduced pumping costs due to the reduction in wastewater flows. There could be O&M benefits from fewer sewer overflows, and the wastewater treatment plants would be treating less influent. However, the economic impact presented here emphasizes the need to have a holistic perspective and consideration of all potential impacts during planning.

5.2 Environmental and Social Impacts

The City is focused on establishing a resilient, drought-proof, and reliable water system for the benefit of the community and the environment. The social and environmental implications of the Baseline and Reduced Flow scenarios are therefore important elements of the evaluation of these two scenarios.

Ensuring water supply reliability and resiliency is paramount to every water utility, and a water shortage can be a detriment to public health. With climate change expected to exacerbate droughts, water utilities like the City are developing strategies to buffer water supply shortages and ensure water supply reliability.

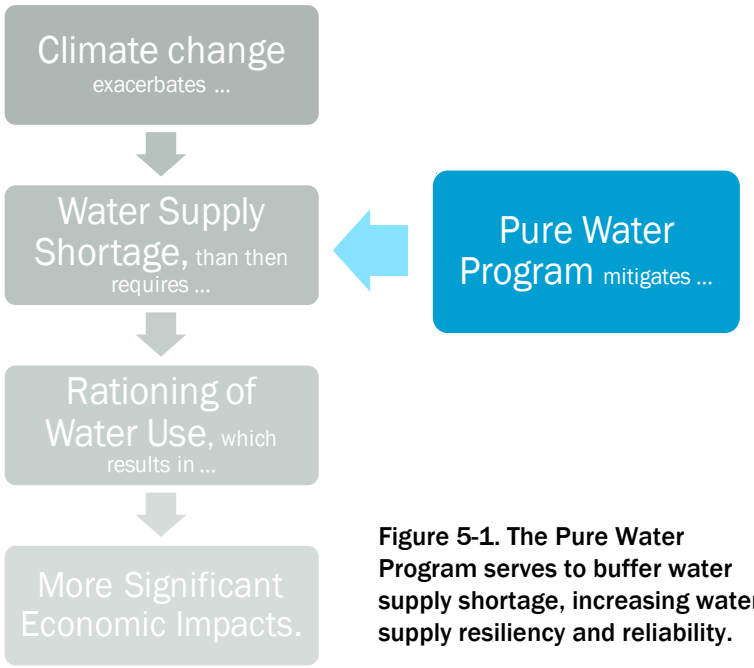


Figure 5-1. The Pure Water Program serves to buffer water supply shortage, increasing water supply resiliency and reliability.

A report published by CUWA in 2009 considers the economic dimensions of urban water shortage and estimates the economic losses resulting from requiring consumers to reduce their indoor residential water use (i.e., in a rationing state). The report focused on CUWA member agencies, which includes the City.

The study reviewed the City's water and sewer rates and calculated the prices per acre-feet in pre- and post-rationing scenarios. **The cost per acre-feet water prices in post-rationing scenarios were higher as the City was making less revenue, but the costs for O&M of the distribution systems remained static. Thus, investing in programs that can mitigate the impacts of water supply shortage provides economic and social benefits.**

Environmental and Social Benefits of the Pure Water Program

The Pure Water Program provides significant environmental and social benefits (Figure 5-2). While both scenarios include the Pure Water Program, the severely reduced wastewater flows defined in the Reduced Flows scenario decreases the volumes of purified water effluent produced. Thus, the Reduced Flows scenario potentially **undermines** the benefits of the Pure Water Program, which include:

- **Development of a locally sources, drought-proof water supply.** The Pure Water Program leverages the local wastewater produced as its source supply. This local supply lessens the City's dependence on imported water, which is susceptible to drought.
- **Reduction in sensitivity to changing source TDS.** Currently, the City imports approximately 85 percent of its water supply from other water areas, including the Bay-Delta and the Colorado River. As discussed in Section 4.3, influent wastewater TDS is heavily dependent on source TDS, and the Colorado River water historically has higher TDS concentrations (Daniel & Associates 2017). By reducing the percentage of imported water and supplementing it with a high-quality local supply, the City buffers and lowers their sensitivity to source TDS fluctuations.
- **Providing a source of emergency supply water.** The Pure Water Program provides a source of reliable water during emergency situations, like earthquakes or wildfires. One of the limitations faced by firefighters is the availability of nearby water. As the Pure Water Programs lessens the City's dependence on their stored water reserves, those remain as a source of emergency supply water. In addition, the pipelines for the City's imported water supplies run over earthquake fault lines, and a substantial earthquake has the potential to cut off those supplies. In that event, the Pure Water Program wastewater can serve as a supplemental supply.
- **Reduction of ocean discharge volume and improvement in quality.** Conservation plays an important role in the reduction of ocean discharge. However, as conservation only reduces the volumes of water entering the system (not solids), this reduction is limited by the minimum flow velocities required to keep wastewater moving in the system. In contrast, the Pure Water Program pulls both liquids and solids out of the wastewater system for water reuse, which can more significantly reduce ocean discharge. In addition, as solids are also removed from the system, TSS volume in the ocean discharge is also decreased. In 2016, there was a 23 percent reduction in ocean discharge due to a combined effort of water conservation and recycled water. By 2035, ocean discharge can be reduced by 65 percent due to a combination of conservation, recycled water, and the Pure Water Program.

Figure 5-2. The Pure Water Program provides social and environmental benefits for the San Diego community.

Source: City of San Diego, 2018b

Other Environmental and Social Impacts of Reduced Flows

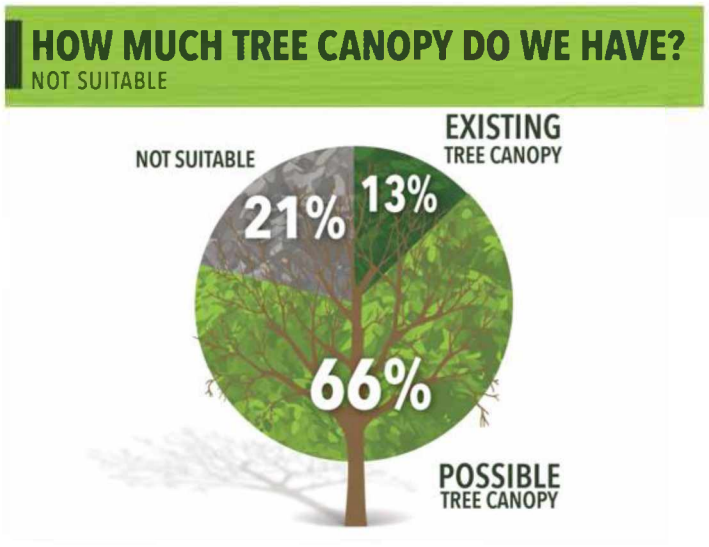
Other social and environmental impacts of the Reduced Flows scenario (as outlined in Section 4) are:

- **An increase in Bioxide® deliveries** has both environmental and social impacts. Increased trucking from reduced flows emits more greenhouse gas emissions into the atmosphere. Many of the injection points are also located within residential communities, and more deliveries means more truck traffic, inconveniencing the residential community.
- **An accelerated rate of corrosion** has both environmental and social impacts. Acceleration in manhole structures means more construction, requiring construction materials and operation of heavy equipment, producing more greenhouse gas emissions.

Commitment to Climate Action Plan

According to the conservation standards currently being developed, the City's "water use budget" is the aggregate total of indoor use, outdoor use, and distribution system losses. There are situations where individuals will argue that meeting the water use budget would be accomplished by focusing on outdoor reductions, thus mitigating the potential impacts of reduced R-gpcd.

However, it is important to consider that the City has also committed to improvements that require outdoor irrigation. For example, the City has committed to a certain tree canopy percentage in their Climate Action Plan (Figure 5-3). This constrains the City to certain volumes of outdoor irrigation to meet these environmentally beneficial goals. Investing in water recycling programs like Pure Water should afford the City more flexibility in their supplier water use target, as regulations intend to incentivize utilities to continue their investment in water reuse.



Year	% Tree Cover
2003	7%
2010	4.2%
2014	13%
Climate Action Plan Targets	
2020	15%
2035	35%

Figure 5-3. The City has committed to 35 percent of tree canopy by 2035 in its Climate Action Plan.
Source: City of San Diego, 2017c

100 Percent Renewable Energy

The Pure Water Program includes a commitment to running on 100 percent renewable energy. This means that greenhouse gas emissions caused by importing water are instead transformed into renewable energy sources. Thus, even though Pure Water may require more energy, the fact that is renewable energy provides an environmental benefit.

SECTION 6

Conclusions and Next Steps

With water use regulations under development per the California Water Action Plan, it is critical to consider the impacts of reduced flows holistically. This case study analyzed the economic, environmental, and social impacts of reduced flows on the City's interconnected water systems.

As supplier water use targets and water use standards are currently in development, it is vital to understand the interconnectedness of the urban water cycle. Changes in one area of the cycle, such as a reduction of flows into the system, is likely to impact other areas. Every action associated with water supply reliability has an important role to play; however, a localized strategy will inherently differ from utility to utility depending on site-specific considerations. As utilities continue to invest in programs and infrastructure that support water supply reliability, it is important to consider how different water supply reliability strategies, like WUE and water supply diversification, can impact each other. The City, as a leader in both strategies, can serve as a valuable case study to provide insight into what those impacts may be. In addition, impacts need to be analyzed through a triple bottom line lens to develop a cost-effective strategy for improved supply reliability while also benefiting the environment and community.

This case study reveals that significantly reduced flows could cost the City on the order of $102,000,000 through 2035 in addition to environmental and social impacts within the region. **These impacts underscore the importance of a holistic analysis of the urban water cycle to ensure development of the best water management plan, as each utility's experience is unique to its water supply situation. This uniqueness also highlights the importance of flexibility in statewide water use standards, as different regions may experience different impacts.** The City is a great example of how a variance could help agencies account for local impacts and investments in water supply reliability measures, including increased use of recycled and purified water as recommended by the California Water Action Plan.

As prefaced above, it's important to note that there are some benefits and impacts of reduced flows that were not quantified in this case study, but are important and should be investigated further. The benefits include:

- Reduced use of water (including imported and desalinated), and the related financial savings and environmental benefits.
- Reduced energy and chemical use in drinking water and wastewater conveyance and treatment.

This report also focused on the impacts of reduced flows from indoor residential use as those flows remain within the interconnected urban water cycle. However, there may also be impacts from reduced outdoor irrigation use including:

- Loss of areas landscaped with irrigated plants, which provide benefits like improved aesthetics, mitigation against the heat-island effect, and increased property values.

Ultimately, increasing water use efficiency has both benefits and potential impacts on water, wastewater, and recycled water systems, which can be balanced through informed policy. A holistic, one-water approach can benefit smart policy and provide the best solutions in managing California's water resources.

SECTION 7

References

Ashley, Richard & Bertrand-Krajewski, Jean-Luc, *Solids in Sewers: Characteristics, Effects, and Control of Sewer Solids and Associated Pollutants,* IWA Publishing, 2004.

Brown and Caldwell, *Blueprint for One Water,* Water Research Foundation, Project #4660, 2017.

California Department of Water Resources (DWR), State Water Resources Control Board, California Public Utilities Commission, California Department of Food and Agriculture, and California Energy Commission, *Making Conservation a California Way of Life,* State of California, 2017.

California Urban Water Agencies, *Adapting to Change: Utility Systems and Declining Flows,* CUWA, 2017.

United States Environmental Protection Agency (EPA), *Design Manual – Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants*, Cincinnati, OH, 1985.

City of San Diego, "Public Utilities Sewer Spills from 2000-2015*", Sewer Spill Reduction Program,* 2016, https://www.sandiego.gov/sites/default/files/sewer_spills_by_year_2000-2015.pdf (February 13, 2018).

City of San Diego, "Pure Water San Diego Fact Sheet", *Informational Materials,* 2017a. https://www.sandiego.gov/sites/default/files/pure_water_san_diego_fact_sheet_9-15-16_1.pdf (February 13, 2018)

City of San Diego, "Pure Water San Diego Phase 1 Fact Sheet"*, Informational Materials*, 2017b. https://www.sandiego.gov/sites/default/files/pure_water_san_diego_phase_1_fact_sheet_-_4-20-17_1.pdf (February 13, 2018)

City of San Diego, *Urban Forestry Program Five Year Plan,* 2017c. https://www.sandiego.gov/sites/default/files/final_adopted_urban_forestry_program_five_year_plan.pdf (February 13, 2018)

City of San Diego, "Service Area Map*"*, 2018a. https://www.sandiego.gov/mwwd/general/servicearea, (February 1, 2018)

City of San Diego, "Pure Water San Diego", 2018b. https://www.sandiego.gov/water/purewater/purewatersd

Daniel B. Stephens & Associates, *DRAFT - Evaluation of Long-Term Trends and Variations in the Average Total Dissolved Solids Concentration in Wastewater and Recycled Water,* Southern California Salinity Coalition and National Water Research Institute, 2017.

EPA, *Design Manual: Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plans*, 1985.

Feeney, C. S., Thayer, S., Bonomo, M., & Martel, K., *White Paper on Assessment of Wastewater Collection Systems,* EPA, 2009.

Stevens, M., *Unintended Consequences of Conserving Water: Leaky Pipes, Less Revenue, Bad Odors,* Los Angeles Times, 2015.

Tran, Q. K., Jassby, D., Schwabe, K.A., *The implications of drought and water conservation on the reuse of municipal wastewater: Recognizing impacts and identifying mitigation possibilities,* Water Research, 2017.

USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume I.* Washington, DC, USA: U.S. Global Change Research Program, 2017.

Yarra Valley Water, *Data Sewer Blockages vs Average Water Usage per Household,* Melbourne, 2011.

CALIFORNIA WATER EFFICIENCY PARTNERSHIP

A Chapter of the Alliance *for* Water Efficiency

June 4, 2021

California Department of Water Resources
Water Use Efficiency Branch
P.O. Box 942836
1416 9th St.
Sacramento, CA 95814

Re: IRWUS REPORT COMMENT LETTER

To Whom it May Concern:

The California Water Efficiency Partnership is a statewide non-profit member-based organization representing over 220 California water agencies, businesses, and other organizations. Collectively our water agency members provide services to over 6.6 million connections across the state. With a mission and commitment to maximize water efficiency, CalWEP has a deep history working on customer side conservation and efficiency programs. We believe that data-driven conservation and efficiency are paramount to ensuring that California has a reliable and resilient water future.

CalWEP appreciates the opportunity to review and comment on the Indoor Residential Water Use Study (Study). We believe the Study provides a helpful snapshot of indoor residential water use in California, along with useful information that can inform how the indoor residential water standard is set. The Study also clearly indicates where there are still big gaps in our understanding of household water use and what it will take to achieve various levels of water use efficiency on a per capita basis across the state.

As noted, CalWEP supports maximizing urban water efficiency and conservation and thus appreciates how the Study summarizes the findings of several technical studies which contain water use data and information to evaluate where we are with regard to indoor water use, and what it may take to lower our statewide average indoor water use substantially in coming years. The Study is expected to include the "information necessary to support a lower indoor residential water use standard that appropriately reflects best practices" (Water Code §10609.4(b)(1)). This focus on an evidence-based approach includes information on the ways the best practices implemented by water suppliers (such as fixture and appliance rebate programs, conservation education, and leak detection programs) -- combined with changes in customer behavior -- has resulted in reduced indoor water use statewide.

But it is also clear from this study that actual indoor water use continues to vary across the state geographically, by residence type and age, due to other factors that this report was not able to identify. This results in significant variation in the average indoor gallons per capita per day (GPCD) of water suppliers statewide.

CalWEP is concerned that the issues of technical feasibility and local cost effectiveness have not been adequately addressed in this study. We believe that the study does clearly lead to a conclusion that achieving an average indoor use of 42 GPCD at a utility scale by 2030 will require the vast majority of residences in the state to be equipped with a 1.28 gallon per flush toilet or better, and high-efficiency clothes washers. In addition, residential leaks will need to be substantially reduced, requiring almost universal use of high-frequency flow monitoring technologies (and/or advanced metering infrastructure) by water suppliers by 2030, and the subsequent action by customers to address the leaks identified.

Further, we have examined the cost for implementing a revised indoor standard. **The total anticipated cost range for reasonably complying with a 2030 standard in which all providers achieve a residential indoor per capita volume of 42 GPCD by 2030 is likely between $2.8 and $4.6 billion.** See the attachment for further information on how we calculated this.

Thus, we request that the Study be submitted to the Legislature without a recommendation for a reduced indoor residential standard at this time. We believe that a more complete analysis of the cost and benefits of a reduced standard is needed, along with more study of other factors causing higher indoor use in some areas. Also needed to be examined carefully are the necessary stakeholder contributions regarding technical and local cost-effectiveness and rate affordability. After this work is done, a recommendation to reduce the indoor standard -- along with needed funding assistance for implementation -- may well be justified.

Thank you for the opportunity to comment. This is an important and potentially costly decision for the State of California if not done carefully. CalWEP looks forward to partnering with the State to ensure that we establish data-driven standards that maximize urban water use efficiency in a manner that also takes into consideration cost for local suppliers and ultimately ratepayers. Please contact Tia Lebherz, Executive Director External Affairs, if you have any questions regarding this information (tia@calwep.org).

Sincerely,

Justin Finch, Chair
California Water Efficiency Partnership
Moulton Niguel Water District

cc: Charlotte Ely, California State Water Resources Control Board

DETAILED COMMENTS FROM THE CALIFORNIA WATER EFFICIENCY PARTNERSHIP

The Indoor Residential Water Use Study does not attempt to evaluate feasibility and cost associated with fixture replacement and leak repair or examine other potential reasons for variable indoor water use. We have examined the question of feasibility and cost, and offer the following points:

- About 5 million inefficient residential toilets are estimated to still be in use in the state[1] and with a natural replacement rate of 4% per year, 2.7 million toilets will still need to be replaced by 2030. Those inefficient toilets are likely to be in older, rural and/or disadvantaged communities, multifamily housing, and other traditionally hard to reach areas. Increased incentives and direct install programs will be required to reach these customers, however significant challenges will still exist to achieve the high levels of customer participation needed. Current program models show that with an average cost of $350 per toilet this would cost an estimated **$945 million dollars between now and 2030.** (Table 1)

- There are an unknown number of older style top-loading clothes washers in residences that use an average of about 40 gallons per load[2], and since these are significantly less expensive than efficient models there will continue to be a mix of both efficient and inefficient machines installed. But given a useful life of only about 13 years, almost 1 million washers are replaced annually. If 20% of future clothes washer sales are substantially incentivized between now and 2030 the result could meet the residential water use reduction needed to achieve the 42 GPCD standard. At an incentive cost in the range of $300-$500 per washer sold (note that this is significantly higher than many current programs), **this would cost between $500-834 million dollars between now and 2030**. (Table. 2)

- Residential leakage (after the meter) accounted for 7.9 GPCD and 14% of indoor use in the 2016 Residential End Uses of Water Study.[3] In general, most residential leakage is associated with a relatively few homes having significant leakage. The only proven approach to address household leakage at the utility scale is to implement high-frequency flow monitoring through the water meter and to alert customers when they have a leak. The cost of high-frequency flow monitoring for leak detection is at least $200 per customer with potentially ongoing fees using advanced metering infrastructure (AMI) or any other product or method currently available. Assuming only half of California households are served by suppliers that have AMI, **the cost for such leak detection capabilities to serve the remaining residences would be between $1.4 and $2.8 billion between now and 2030.** (Table 3)

- **The total anticipated cost range for reasonably complying with a 2030 standard in which all providers achieve a residential indoor per capita volume of 42 GPCD by 2030 is likely between $2.8 and $4.6 billion.** (Table 4)

The Study provides strong evidence that most California communities are generally on track to meet the existing indoor residential standard of 50 GPCD by 2030. But if the standard is lowered to the proposed

[1] Koeller, J. 2017. A Saturation Study of Non-Efficient Water Closets in Key States. Alliance for Water Efficiency and Plumbing Manufacturers International

[2] Mayer, P. et. al. 1999. Residential End Uses of Water. American Water Works Association Research Foundation. Denver, Colorado.

[3] DeOreo, W., P.Mayer, et. al. 2016. Residential End Uses of Water, Version 2. Water Research Foundation. Denver, Colorado

level of 42 GPCD by 2030, the result would be an annual reduction of water use statewide of about 354,000 AF per year at a significant cost.

Conservation and efficiency are a critical strategy to ensuring communities have long-term, reliable water supplies. CalWEP's mission is to maximize water efficiency through sound data-driven policy and cost-effective strategies. Numerous reports show that efficiency is often one of the most cost-effective ways to ensure adequate supply; however, as our estimates show, the 42 GPCD recommended standard by 2030 may prove to be cost-prohibitive at the local level.

We believe that many of the communities in which this effort will necessarily need to be targeted may find that it will not be affordable to meet the proposed standard. Water affordability is already a concern in many parts of the state. The communities which can least afford to meet this standard will have to rely on significant state and local funding to implement it, which must be included in the recommendation proposed by the Study. The Study cites Australia's recent experience achieving substantial indoor use savings during Australia's millennium drought. It should be noted that this achievement was made possible through billions of dollars in Australian federal funding.

See the attached Tables for our calculations.

Table 1: Estimated cost of replacing inefficient toilets in California

# of Inefficient Toilets	Incentive Per Toilet	Cost of Toilet Replacement ($)
2,700,000	$350	$945,000,000

Table 2: Estimated cost of clothes washer incentives required to meet California indoor efficiency goals, 2021 - 2030

Category	Value	Reference
Housing Units in California	14,180,000	2019 US Census data
% of home with a clothes washer	85%	https://www.prnewswire.com/news-releases/us-census-bureau-daily-feature-for-october-26-washing-machines-300343533.html
~ # of Clothes Washers installed in CA	12,053,000	
% of CW sales that must be incentivized	20%	
Cost of Incentive per washer		Estimated range based on existing washer programs.
~ Clothes washer sales/year in California	927,154	Assumes a 13-year useful life.
~ Cost of Clothes Washer Incentives, 2021 – 2030.	**$500,663,077**	**Low**
	$834,438,462	**High**

Table 3: Estimated cost of household leak detection to meet California indoor efficiency goals

Category	Value	Reference
Housing Units in California	14,180,000	2019 US Census data
% of home leak detection	25 - 50%	Estimate
Cost of Incentive per Housing Unit	$200	Low-cost estimate based on current technology.
~ Cost of Household Leak Detection.	**$1,418,000,000**	**Low**
	$2,836,000,000	**High**

Table 4: Estimated total cost of meeting proposed California indoor efficiency goals

Category	Low Estimate	High Estimate
Toilet incentives	$945,000,000	$945,000,000
Clothes washer incentives	$500,663,077	$834,438,462
Leak detection monitoring	$1,418,000,000	$2,836,000,000
Faucets and Showers	$0	$0
Total	**$2,863,663,077**	**$4,615,438,462**

Water Use and Efficiency Branch
Department of Water Resources
901 P Street
Sacramento, CA 95814

Submitted via WUE@water.ca.gov

Re: Comments on the draft Indoor Residential Water Use Standards Report

Dear Water Use Efficiency Team,

Thank you for the opportunity to provide comments on the draft Indoor Residential Water Use Standards report jointly developed by the Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB) staff and consultants.

We appreciate the extensive research that went into draft report and we support the draft report's core findings:

1. California's current indoor residential water use is approximately 49-52 Gallons per capita per day (GPCD);

2. Indoor water use across all has been steadily declining for decades both in California and nationally;

3. California's indoor residential water use will continue to decline 'naturally' due to new construction and passive turnover of inefficient toilets and water devices; and,

4. The State's indoor residential water use efficiency standard should reflect this 'natural' improvement in water efficiency. The joint recommendation is to retain the current 55 GPCD until 2025, and then reduce it to 47 GPCD until 2030 and to 42 GPCD until 2035.

Consistent with DWR's commitment to the Human Right to Water, we appreciate the Department's recognition that lower income services areas should not be disproportionately negatively affected by any standard as well as its finding that the recommended efficiency standard will not be biased towards suppliers with high poverty levels (page 57).

However, the draft report fails to provide a robust discussion of how the efficiency standard may improve affordability and the Human Right to Water.

- **Low income customers can least afford to waste water, but are most likely to have inefficient equipment and leaks**: Low income/disadvantaged communities can't afford to waste water. When it comes to water-use behavior, low-income households are careful with water use, using less water on average than higher-income homes, even when controlling for other variables (DeOreo et al. 2011, California Single-Family Water Use Efficiency Study). Yet low-income families tend to occupy older buildings with less efficient appliances and more leaks, which mean they are often saddled paying more for water to accomplish the same tasks as their wealthier neighborhoods with newer, better-maintained homes.

- **Urgent Need for Water Efficiency Improvements to Address Affordability.** California has over 13 million low income households. These households paid 45% more for their drinking water 2015 than they did in 2007. Low income communities of color have the greatest need to ensure that they are not paying for water waste in their homes. This is particularly important now as low-income communities throughout the state struggle with COVID-related utility debt. As recommended by the U. S. Water Alliance, assistance programs to reduce the cost burden on these communities is the first urgent step but an additional key step is installation of more efficient plumbing fixtures so that these communities do not have to pay for water that is being wasted through leaks and/or inefficient appliances (U.S. Water Alliance, 2017. "An Equitable Water Future: A National Briefing Paper").

- **Significant Opportunity for Combined Efficiency and Affordability Improvements.** Many low income/disadvantaged communities are located in older, pre-2000 constructed homes which typically have inefficient toilets and problems with leaks due to the age of the homes and lack of adequate resources to repair or replace these devices. A 2017 saturation study found that an estimated 20% of California's toilets are still inefficient (AWE, 2017. "A Saturation Study of Non-Efficient Water Closets in Key States"). Also, many water agency rebate programs have not been designed to effectively reach low-income/disadvantaged households so many communities have not had equitable access to these incentives. A 2020 AWE study assessed a combined water affordability and conservation potential in Detroit, finding significant water savings and customer bill savings from targeted retrofit of inefficient toilets and leak reductions in low income neighborhoods (AWE, 2020 "An Assessment of Water Affordability and Conservation Potential in Detroit, Michigan").

- **Wealth Inequities and Water Rate Impacts**. The reality is that wealthier residents use more water than less-affluent customers. However, higher water use also drives significant costs for water agencies as they work to meet these demands which result in higher costs for all customers and disproportionate affordability impacts on low income communities of color. Studies show long term water conservation results in significant avoided costs for the water agencies and rate savings for their customers. A 2018 study found that Los Angeles's conservation programs between 1990 and 2016 avoided roughly $11 billion in water costs. Customer bills are 27% lower than they would have been (AWE, 2018. "Lower Water Bills: The City of Los Angeles Shows

How Water Conservation and Efficient Water Rates Produce Affordable and Sustainable Water Use"). The extent to which savings like these benefit low-income communities depends in part on a water agency's rate design.

At the May 21 public workshop and in subsequent comments, many water agencies raised "affordability" concerns, suggesting that DWR's recommendations could effectively force low income communities to install costly indoor water efficiency appliances or cause water agencies to raise rates in a manner that would impact these communities.

The first comment appears to be based on a water agency misunderstanding for how the indoor standard will be used to implement "Making Conservation a California Way of Life". Individual customers are NOT required to meet the indoor residential water efficiency standard. The law gives water agencies complete flexibility to choose how to meet their agency's conservation objective. An agency could do nothing to improve indoor water efficiency and instead focus its resources on outdoor water use efficiency or leaks.

This comment also ignores the possibility that utilities and government agencies can (and should) offer direct installation of water efficient retrofits or other targeted financial incentives for low-income households to offset the cost of upgrading their home appliances and repairing leaks. Conservation and efficiency are the lowest-cost source of new supply (Cooley and Phurisamban 2017, The Cost of Alternative Water Supply and Efficiency Options in California). Financial incentives to upgrade home appliances and repair leaks in the homes of low and middle-income customers, particularly in the form of direct installation programs, should be a financial priority for water utilities and regulators to advance equity and the most affordable source of water supply. Direct installation programs can also create opportunities for workforce development pathways into utility careers (Parks 2021, A Survey of Participants in the Los Angeles Utility Pre-Craft Trainee Program). We strongly support the use of direct-install programs.

The extent to which low income/disadvantaged communities are negatively impacted by water agency rate increases is exacerbated by rate design problems created by the agency. As a fundamental tenet of the Human Right to Water, agency water rates can and should be designed to keep prices affordable for basic human needs and services. The most important rate design tool to keep essential water use affordable is to decrease the amount charged in flat fees. Typically utilities recover a large portion of their revenue from flat fees, also known as the meter charge. Consequently, low water users pay more per gallon than high water users. This regressive rate structure has two impacts. First, it charges people more per gallon to meet the basic needs protected under the Human Right to Water, while charging less per gallon to customers using water for discretionary purposes. Second, charging more per gallon for low water users places a greater cost burden on the poor, who are more likely to be low water users. Utilities can greatly reduce the cost for customers to meet the Human Right to Water by reducing their fixed charges. Another key approach to explore further is the potential of budget based rate structures, which have proven to be a non-regressive approach to significantly reduce water waste while generating sustainable revenues for water agencies (Baerenklau, Kenneth et. al., 2019. "Can Allocation-Based Rates Promote Conservation and Increase Welfare Capacity: A California Case Study).

Underlying the agency comments are disturbing assumptions about equity and how the needs of the State's low income/disadvantaged communities should be addressed. Water agencies are effectively suggesting that the State should adopt a less-efficient indoor water standard because it would be too much of a burden on these agencies to ensure that their water rates and programs are equitable.

DWR should reject these arguments as they are inconsistent with the Human Right to Water. We support the joint DWR/SWRCB recommendations for setting higher efficiency standards for indoor residential water use and view these recommendations as being fundamental to implementing the Human Right to Water.

We additionally urge the state to ramp up programs that provide direct-install water efficiency programs targeted to low-income communities of color.

We also recommend that the State make funding available to water agencies to improve their water rate designs so that they do not "have" to raise rates in a way that adversely impacts low income households and disadvantaged communities.

Finally, it is worth noting that while access to safe and affordable drinking water is of paramount concern, there are also other water equity concerns that can be better met with improved water efficiency. People fish in rivers for sustenance, for their livelihoods, and in the case of California tribes, as part of their religious heritage and cultural identity. If the state and water agencies invest to help people in cities meet their essential indoor needs of drinking, cooking, cleaning, and hygiene more efficiently, it means that regulators have the option to protect more instream flows during drought without endangering public health and safety. California also faces a housing and homelessness crisis. Housing has become unaffordable because of a decades-long failure to build sufficient homes to accommodate a growing population. For decades the state has underbuilt homes, especially homes affordable for those earning less than the median income, leading to shortfall of millions of housing units. If existing residential water use stays the same, adding millions of new housing units near job centers as called for by Governor Newsom and a host of housing experts[1] could overtax cities' current water supplies. Cities need to prioritize efficiency to ensure there is enough water supply for everyone. Reducing per-capita water usage will not build housing units, but it will remove one impediment to addressing the housing and homelessness crisis.

Thank you for your consideration of these comments.

Sincerely,

Jennifer Clary, California Director
Clean Water Action

Jonathan Nelson, Policy Director
Community Water Center

[1] e.g. see McKinsey 2019, Affordable Housing in Los Angeles, and SPUR 2021, What It Will Really Take to Create an Affordable Bay Area

Laura Feinstein, Ph.D. Sustainability and Resilience Policy Director
SPUR

Lauren Ahkiam, Water Campaign Director
Los Angeles Alliance for a New Economy (LAANE)

.

CWSA

June 4, 2021

Water Use and Efficiency Branch
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Residential Indoor Water Use Study and Standard Recommendations

Dear Water Use and Efficiency Branch:

The Community Water Systems Alliance appreciates the opportunity to comment on the above-referenced study and recommendations under consideration by the Department of Water Resources (DWR) and the State Water Resources Control Board (Water Board). The Community Water Systems Alliance (CWSA) is a group of water districts and companies widely varied in size and resources, organized to provide a greater voice for disadvantaged water systems. Although in California many disadvantaged community water systems are small and thus fall below the definition of "urban retail water supplier," many urban retail water suppliers do include disadvantaged communities as a part or the total of their service areas.

1. **Limitations of the Study**. The study notes from the very beginning the inherent difficulty with determining *indoor* water use, since it is not separated from the total residential use. Extensive statistical analyses were required in the effort to disaggregate indoor water use from total billed uses. Extraordinary steps were taken to make assumptions, adjustments, and inferences, correct for "known unknowns," detect anomalies, and make comparisons. We appreciate that you worked with a stellar technical advisory team to advise on the methods, but it is equally important to recognize that many decisions were made to overcome the limits of data and qualitative information. Section 7 documents many of the limitations the study, but instead of digging into these with the importance they deserve, they are merely mentioned. Then in Section 8, the overall degree of uncertainty with the data, and the challenges for achieving further indoor efficiency are virtually ignored by recommending reductions of the current legislated indoor water use standards.

2. **Trends do not guarantee future performance**. In justifying the recommendation for lowering indoor standards beyond the reductions already set in law, the report states, "When estimating future water use, it is informative to consider trends in water use over time. The main trend has been declining indoor residential water use at a rate of approximately 0.4 to 0.9 percent per year." The danger in assuming this trend predicts the future is that the study does not address demand hardening in any meaningful way, so

areas where both passive and active conservation have occurred may be approaching the maximum effect of this trend. The report mentions countervailing factors in Section 7 but does not give them the serious consideration they deserve.

3. **Essential qualitative information is missing.** The study design takes an almost completely statistical approach, giving almost no attention to what a more qualitative investigation, actually getting real insights "on the ground" might reveal. We acknowledge that Section 6 incorporates some interviews to look at the interconnections of water, wastewater, and water recycling, which is useful. But many other important opportunities for deeper understanding are missed. Figures 5.3-1a, 5.3-1b, and 5.3-1c (pp. 59-61) are good illustrations of the point. While the majority of water suppliers in this non-random and likely unrepresentative group of 157 (out of more than 400 urban water suppliers) fall below the current legislated standards, it is also important to recognize the high GPCD suppliers. What is the reason for their high R_i GPCD? The very highest is more than double the current standard, and is shown as in the top quartile for the "poverty" measure. What explains the right-hand tail of this distribution? Where would the other 250-plus urban water suppliers fall on this scale? How is this distribution factored into policy recommendations, compared to the objective to "Ensure that lower income service areas are not disproportionately affected by any standard" (p. 5)?

   On a related point, paragraph 7.4 acknowledges there is a cost for meeting residential water use efficiency standards, and implementation may not be affordable in some circumstances. Dismissing this issue by stating water use efficiency is often less expensive than developing new water supplies is a logical fallacy, since the issue is using *less of an existing supply*. This issue cannot be dismissed so lightly when making policy recommendations as significant as those in the concluding section of the report.

   Overall, the report essentially dismisses this issue with the statement that suppliers may focus on other areas to meet their overall water use objectives, or may pursue incentives or variances. Several CWSA member agencies serve disadvantaged communities in desert regions, and their preliminary findings show that evaporative coolers (swamp coolers) – which may be essential for seniors or other vulnerable people living there – use from 6 to 13 gallons of water *per hour.* Variances for extensive use of swamp coolers will be necessary, but it is still uncertain what those will be. We find the study's somewhat dismissive approach inadequate, and recommend that additional effort must be made to understand the obstacles and challenges that may hinder some suppliers' achievement of lower residential indoor standards.

4. **Study recommendations**. CWSA appreciates the constraints of time, data, and resources that limited the study. However, the paltry rationale in Section 8 sets aside crucial cautions of the previous section, to put forth what seems like a political recommendation, possibly influenced by AB 1434. The study may be "the most robust analysis of indoor residential water use in California to date" (p. 80 footnote 34), but its shortcomings – both

inherent in data and from lacking real qualitative investigation – do not adequately support the joint recommendations.

CWSA draws the following conclusions.

a) Given the inherent uncertainty and deficiencies of the study, the recommendation for changes to current standards is not adequately supported and should be retracted until a deeper understanding can be achieved.
b) There are reasonable arguments – some but not all identified in the study – for caution before changing any of the existing residential indoor standards, including those for 2025 and 2030, as well as 2020.
c) Policy recommendations on indoor residential water use standards should be the subject of much more extensive collaboration with stakeholders, including representatives from systems that serve disadvantaged communities, to gain a better understanding and foundation for the ultimate recommendations.

Again, we appreciate the opportunity to offer these comments. If you have any questions on CWSA's comments and concerns, please contact me at tim@ostrategiesgroup.com.

Sincerely,

Timothy Worley, PhD
Managing Director
Community Water Systems Alliance

cc: Marina West, Bighorn-Desert View Water Agency
Ray Kolisz, Thousand Palms Water District
Dan Ferons, Santa Margarita Water District

Cucamonga Valley® Water District
Service Beyond Expectation

10440 Ashford Street, Rancho Cucamonga, CA 91730-2799
P.O. Box 638, Rancho Cucamonga, CA 91729-0638
(909) 987-2591 Fax (909) 476-8032

John Bosler
Secretary/General Manager/CEO

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St, Sacramento, CA 95814

Subject: Comment Letter - Comments on the Public Review Draft Report to the Legislature on the Results of Indoor Residential Use Studies.

Dear Water Use Efficiency Branch,

The Cucamonga Valley Water District (CVWD) appreciates the opportunity to submit comments to the California Department of Water Resources (DWR) on the *Public review draft report to the legislature on the results of the Indoor Water Use Studies.* Cucamonga Valley Water District serves approximately 200,000 residents in its 47-square-mile-area that includes the City of Rancho Cucamonga, portions of the cities of Fontana, Ontario, and Upland, and some unincorporated areas of San Bernardino County. CVWD provides potable water supply, recycled water supply, and sewer collection services to its ratepayers. In 2017 CVWD and other stakeholders in the water community worked closely to thoughtfully negotiate provisions in AB 1668 and SB 606 "Making Water Conservation a California Way of Life" to identify standards based water use targets and enhancing drought, preparation, and reporting requirements. CVWD recognizes the responsibility of meeting the urban water use objectives set in the legislation.

We recognize that DWR in coordination with the State Water Resource Control Board (State Water Board), had a statutory deadline of January 1, 2021 to conduct necessary studies and investigations on indoor water use and may jointly recommend to the Legislature a standard for indoor residential water use (standard). However we have significant concerns that DWR's current path has not complied with the statutory requirements of Water Code Section 10609.4 to:

1. Collaborate with, and include input from, water and wastewater agencies in the work on the studies, investigations and the ultimate report, and
2. Analyze the impacts on water and wastewater management of changing the standard for indoor residential water use.

It is important that these statutory requirements are met in a meaningful way before DWR moves forward with jointly recommending standards for indoor water use. We propose that DWR:

1. Withdraw the joint recommendation for the indoor residential water use standard (recommended standard) included in the draft Report; and
2. Work collaboratively with stakeholders, including water, wastewater and recycled water agencies over the next six to nine months to analyze and quantify the impacts of a yet

> another changed standard. This analysis should help inform the basis for DWR and the State Water Board's revised recommendation to the Legislature, if needed.

DWR's draft recommended standard would first realize a change in the standard in 2025 (following the enactment of authorizing legislation). Consequently, our recommendation would have no impact on expected water savings in the interim and it could avoid unnecessary adverse impacts to water and wastewater management. In addition, it would allow DWR to meet the statutory requirements to collaborate and analyze the impacts on water management. Additionally, we note that while the statutory draft document requirement for DWR to conduct studies and investigations by January 1, 2021 is mandatory and has been missed, the requirement for DWR to develop a joint standard is permissive discretionary.

Absent a collaborative stakeholder process and adequate analysis that supports a recommended change in the standard, the indoor water use efficiency standard should remain at the current statutorily set standards of 55 gallons per capita daily (gpcd) until 2025, 52.5 gpcd until 2030 and 50 gpcd after 2030.

Specific Issues of Concern with the Draft Report, Recommendation and Process

We would like to work with DWR to address the following concerns:

1. REQUIREMENT TO COLLABORATE WITH WATER, WASTEWATER AND RECYCLED WATER AGENCIES

DWR's current effort would not meet the legislative requirements to collaborate with, and include input from, water and wastewater agencies.

> The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

We appreciate that DWR held a day-long workshop on May 21 in response to concerns raised regarding collaboration with stakeholders. However, proposed draft standards were presented before stakeholder collaboration occurred. Stakeholders did not have an opportunity to review the results of the indoor water use studies and provide meaningful input to inform the draft standard prior to its release. Additionally, it is our understanding that participants in the water use studies have had mixed results in providing clarifications or updating the data ultimately used for the draft recommended standard. Collaboration with stakeholders involves DWR and the stakeholders engaging in meaningful dialogue, providing input and feedback, and jointly working through issues. We are ready to work collaboratively with DWR and the State Water Board.

2. REQUIREMENT TO ANALYZE IMPACTS OF A CHANGED INDOOR STANDARD

DWR current efforts do not meet the legislative requirement to analyze the impacts of changing a standard. AB 1668 requires:

> The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to,

environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

It is noted in the draft report that the qualitative analysis, that was performed on water supply, wastewater, and recycled water systems benefits and impacts are highly variable and depend on local systems' conditions, as well as the magnitude of the effect of a changing standard within the local agencies service area.

"As such, a quantitative analysis is beyond the scope of study"[1]

Given the significant reductions to indoor residential water use proposed in the study the new recommended standards are not acceptable. The draft recommendations will create significant adverse impacts on water and wastewater agencies and how those services are managed. The legislative requirement was intended to ensure that adverse impacts are understood in order to inform DWR's recommendation, if there is one. **Before DWR moves forward with recommending a changed standard, it must conduct meaningful, quantitative analysis on the impacts of a changed standard.**

We have significant concern with DWR's conclusion that adverse impacts, such as stranded assets and water quality impacts, can simply be overcome with an undefined amount of time and money. Time and money are real constraints that must be given due weight in the recommendations. Further, expending time and money on meeting an indoor standard that is not based on sound data and analysis takes those resources away from other important water agency actions related to drought planning, climate adaptation, affordability, and compliance with water quality objectives, etc.

Additionally, the adverse impacts of lowering the indoor standard could impede the achievement of the State's other water goals, e.g., increase recycled water to 2.5 million acre-feet a year by 2030 and reduced reliance on the Delta, which should be considered as well.

DWR should analyze the impacts outlined below. Where impacts are unavoidable, the State should partner with water, wastewater and water recycling agencies to mitigate those impacts.

A. Operational Impacts

Water and wastewater systems are designed, constructed and operated for a minimum level of flow; any standard's effect on Ri-gpcd may alter hydraulics in these systems: total volumes and velocities may be affected along with water and wastewater quality, energy use, operation and maintenance requirements, and planning and design. **Given the significance of these adverse impacts, DWR should analyze various standards to understand how adverse impacts can be minimized while achieving water savings**

1. ADVERSE IMPACTS IDENTIFIED- DWR has identified that reduction in indoor residential water use could result in adverse impacts that utilities need to address.

   Water Utilities

   - Deterioration of water quality due to increased retention time in distribution system
   - Stranded assets and stagnation challenges from reduced water quantity

[1] Preliminary indoor Residential Water Use Study Findings (sharepoint.com)

- Reduction in revenue from reduced water sales

Wastewater Utilities

- Increase in odors and accelerated corrosion from higher sewer gas concentration
- Increased occurrence of sewer blockages and overflows
- Impacts on wastewater effluent quality and increased chemical use from degradation of wastewater influent quality

2. ADDITIONL IMPACTS NOT IDENTIFIED: ENVIRONMENTAL FLOW- – DWR should recognize the potential adverse impact of reduced environmental flows associated with decreased discharges from recycled water and wastewater treatment facilities. DWR did not recognize this as an adverse impact that could negatively impact other beneficial uses of water and any regulatory/permit conditions of those discharges.

B. COST IMPACTS

Reduced snowpack, shorter and more intense precipitation events require water agencies to actively plan for shifts in precipitation, runoff and extreme events to meet the State's water needs. In addition to needed investments due to aging infrastructure and a growing population, water agencies are balancing the State's goal of achieving reliable access to safe and affordable water. We are concerned that DWR has not adequately analyzed the costs of its draft recommended standard to inform a cost-effective recommendation. We urge DWR to conduct a reasonable cost-effectiveness analysis to better understand the following impacts and inform its recommendation:

1. The draft Report indicates that "water use efficiency is often less expensive than developing new water supplies and may help ensure equitable and affordable access to water." Additionally, it anticipates that many agencies will be able to achieve the draft recommendation through passive savings, and that passive savings would account for a 0.5 gpcd per year. We have significant concern that DWR is overestimating the passive savings and therefore underestimating the need for active savings and the associated cost to meet the draft recommended standard. The study does not analyze potential economic impacts.

   The bulk of passive savings have already been captured in water agencies' baseline indoor water use levels. In California today, it is estimated that approximately 80 percent of all toilets are as efficient as available. Water agencies in California have invested more than $285 million in toilet rebates and incentives replacing nearly 4 million toilets. Homeowners have replaced another 12 million toilets irrespective of water agency rebates. Because of the significant adoption of water efficient indoor devices, many water suppliers have shifted to outdoor water use efficiency efforts in order to maximize the cost-benefit. Additionally, because water agencies have been implementing robust indoor water use efficiency programs for decades, most of the cost-effective replacements have already been made. Water agencies will need to shift to more expensive options that are not cost-effective.

   CVWD participates in a regional rebate program, which is available to the District's residential and commercial customers. Rebate for residential customers include: high-efficiency washing machines, high-efficiency toilets, weather-based irrigation controllers, turf removal, and rain barrels, and water cisterns to promote water conservation. In addition, the District also offers

its customers an automatic water softener removal rebate with free disconnection and removal through IEUA. Additionally, the District has a Water Watch Program to enable customers to identify and fix leaks in and around their homes following a few basic steps. The District provides Home Water Audits to customers who have not been able to find the water waste source even after completing the basic steps.

2. **COST OF ADVERSE IMPACTS** - The draft Report identified nine adverse impacts and adaptation strategies. According to the report, "any of the adaptation strategies cited require increased investment from utilities," or would result in increased cost or higher costs than originally planned or budgeted. Additional analysis is needed to quantify costs and cost-effectiveness, as well as resources necessary to mitigate those impacts. Planning and investments for changes in infrastructure and facilities take time and money. Quantification of specific benefits and impacts will depend on magnitude of change, utility of specific conditions and characteristics, and how the COVID-19 pandemic shifts where and how water is used. Unfortunately no quantitative benefit and impact analyses were not conducted for this study.

C. Feasibility

We have concerns that the feasibility considerations outlined below were not considered in DWR's draft Report. We urge DWR to consider these factors.

1. **TIMELINE: 47 GPCD BY 2025** – The draft Report proposed a recommended standard of 47 gpcd by 2025. 46 percent of suppliers are currently above that draft recommended standard. While recognizing that the draft standard is not self-implementing and would require legislation to go into effect, this new standard provides only a few years for nearly half of all systems to achieve significant water savings from the current 55 gpcd statutory set standard. Many agencies are in agreement that this is not enough time to meet the draft recommended standard.

2. **SATURATION AND DIMINISHING RETURNS** – As mentioned in the above section, indoor water use rebates have been part of suppliers' water efficiency programs for decades. One primary driver for these rebates was to accelerate the replacement of older, higher use fixtures like toilets beyond the natural replacement rate with high efficiency models as outlined in the national Energy Policy Act of 1994 and California's Title 20 (2015). Nearly three decades later, both rebates (active savings) and natural replacement (passive savings) have drastically shifted the indoor fixture inventory in homes and businesses toward efficient models. In fact, many suppliers no longer offer indoor rebates due to declining demand from customers and ample efficient fixture saturation in their service area. Current residential indoor water use represents decades of steady improvements in indoor water use efficiency, limiting the potential for additional savings.

   While there are still older fixtures in use in varying amounts throughout the state, the reduced savings potential will come at a much higher cost. The remaining older fixtures are most likely in multifamily (renters) and low-income households. This population is not likely to respond to rebate programs in which upfront customer money is required. In order to capture indoor water savings in these households, suppliers would need to implement a (no customer cost) direct install program in which both the fixture and installation are provided. Direct installation programs typically cost 3-5 times more than rebates per fixture but achieve the same per fixture

water savings. In addition, it would require significant additional outreach to get participation from this remaining group.

CVWD conducts extensive public outreach/information programs for its customers to educate and encourage them on the benefits of water conservation. The District implements outreach campaigns regularly to strategically reach customers to provide critical messages like the importance of water use efficiency. Campaigns include drought messaging, the Value of Water campaign, investment in infrastructure, and more. The District also provides water conservation information and updates through monthly billing inserts, newspaper and community ads, social media, participation in several community events, posts banners, signs, among others.

D. Affordability and Impacts on Disadvantaged Communities

The Water Resilience Portfolio recognizes the need to fulfill the Human Right to Water – that every human being has the right to safe, clean, affordable and accessible water adequate for human consumption, cooking and sanitary purposes. The draft Report acknowledges that the studies did not analyze affordability and impacts to disadvantaged communities. Due to cost impacts and the potential to impact rates, as well as the burden the standards will place on multi-family and low-income households to install more efficient devices, we recommend that DWR consider both the impacts and necessary resources to mitigate those impacts on low income households and disadvantaged communities.

E. Other Considerations

1. **Population Data:** Residential indoor water use estimation is highly dependent on population. In the Draft Report, the indoor residential water use standard is developed on a per-person basis meaning accurate population counts are essential for determining g a more accurate gcpd. However, 2020 U.S. census data was not available for the study and DWR calculated the population for the distribution analysis from persons per household DOF or ACS data and ACS tract data for the baseline analysis. We recommend that DWR update the studies to include 2020 U.S. census date that is now available. We note that that DWR is proposing no change to the standard from the current default until 2025 and so this would no impact water saving and world provide a more accurate Ri-gpcd.

   Since the last Census, CVWD has seen a substantial increase in the population it serves that would not reflect the population used to develop the current study. Two of the largest cities we provide service for City of Rancho Cucamonga and Fontana have estimated an increase of population.

   - City of Rancho estimated a population percent change of 7.4%
   - City of Fontana estimated a population change of 9.2%

   In the last 10 years, the Inland Empire region has seen a substantial increase in population in contrast to other regions in the state, due to surplus of land that has been developed for housing, attracting families in urban settings to relocate to our region.

2. **Future Population Growth**: CVWD has analyzed future growth and thus the projected population using a land use demand model which estimated potable water demand based on land use categories and acreage. Three significant future projects under consideration were analyzed and incorporated into the acreage inventory. Etiwanda Heights Neighborhood & Conservation Plan (EHNCP) is progressing through the approval process; development of this project, with approximately 600 acres or more of buildable area, will have a significant impact on water demands in the City of Rancho Cucamonga. This development is expected to be completed in phases by 2035 to 2040. The significant increase in the projected population in 2030 is attributed to this development. Although development has not yet been approved, the City of Rancho Cucamonga has annexed 4,085 acres of the Etiwanda Heights area from San Bernardino County to its boundary. The other significant project within the District's service area is the West Gate project in the City of Fontana. Based on the conversation with the City of Fontana staff, this project was reviewed and incorporated into the acreage inventory. Although these projects have not had final approvals by the Cities of Rancho Cucamonga and Fontana, the District is including these projects into the land use demand model and its updated forecast so it can anticipate the demand for water supplies.[2]

3. **Increased Permanent Telecommuting**: DWR should take into account that millions of Californians may not return to a regular in-office work schedule, resulting in a permanent increase in residential indoor water use not reflected in the draft standard. The draft Report indicates that the "models detect a strong, significant effect of the percentage of over 65 population on Ri-gpcd. For every 10 % increase in the over 65 population proportion, Ri-gpcd increases by 3-5 gpcd." Since "the population over 65 is expected to capture situations where customers are home during the day," we would expect that any increase in telecommuting would have the same effect.

   The draft report indicates that the increase of indoor residential water use due to COVID-19 is important because there is no CII indoor water use standard.

   > "When water use shifts from a sector for which there is no standard (CII) to a sector where there is a standard (indoor residential), this could affect a Supplier's ability to meet their water use objective even if their overall water use declines. The persistence of this increase and associated effects on CII and overall water use objectives is currently unknown."[3]

   We note that DWR is proposing no change to the standard from the current default until 2025 and so including telecommuting data would not impact water savings and would provide a more accurate Ri-gpcd.

4. CONSIDERATION WITHIN MAKING CONSERVATION A CALIFORNIA WAY OF LIFE

We urge DWR to ensure that the final standard meets the intent of the Making Water Conservation a California Way of Life. The design of the urban water use objective was intended to provide flexibility to urban retail water suppliers implementing water use efficiency measures.

---

[2] https://www.cvwdwater.com/DocumentCenter/View/4741/Final-Draft-Cucamonga-Valley-Water-District-2020-UWMP?bidId=

[3] Preliminary indoor Residential Water Use Study Findings (sharepoint.com)

> "Local urban retail water suppliers should have primary responsibility for meeting standards based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.[4]

We have significant concern that the recommendation for a 42 gallon per capita day indoor standard, the 25th percentile of the current 2020 baseline is not a reasonable efficiency standard and will undermine the intent of Making Water Conservation a California Way of Life, which was to allow agencies to cost-effectively and flexibly implement water use efficiency.

Water agencies are at the forefront of preparing for and managing the impacts of longer and more intense droughts. As many of California's regions enter a second consecutive dry year and drought, much has been learned and improved on following California's historic 2012-2016 drought. Additionally, many agencies' demand has not fully returned to pre-drought levels indicating prolonged reduced usage. Water agencies continue to make significant progress to reliably meet the water needs of California's communities, economy and the environment.

Cucamonga Valley Water District appreciates the opportunity to provide comments and looks forward to continued collaboration with the DWR and the State Board to successfully implementing Making Water Conservation a California Way of Life. If you have any questions or concerns regarding CVWD's comments, please contact Eric Grubb at 909-987-2591 or ericg@cvwdwater.com.

Sincerely,

John Bosler
General Manager/CEO

[4] Water Code Section 10609(c)(1)

EAST BAY
MUNICIPAL UTILITY DISTRICT

CLIFFORD C. CHAN
GENERAL MANAGER

June 3, 2021

VIA EMAIL wuestandards@water.ca.gov

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St, Sacramento, CA 95814

Re: Comments on Public Review Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies

Dear Water Use Efficiency Branch:

The East Bay Municipal Utility District (EBMUD) appreciates the opportunity to review and provide comments on the Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies (Draft Report). EBMUD supported AB 1668 and SB 606 that established the State's long-term conservation framework in 2018. EBMUD has over forty years of real, on-the-ground experience in improving water use efficiency, strongly supports water conservation, and has the track record to prove it.

We believe any new regulations should be based on science and real-world experience, and thoroughly consider the feasibility and potential unintended consequences. EBMUD has serious concerns with the proposed indoor residential water standards presented in the Draft Report. The Draft Report recommendations do not meaningfully consider the public health implications, impact on affordability, disproportionate effect on disadvantaged communities, and the real, durable shifts in residential water use as a result of the global COVID-19 pandemic. Additional details on our areas of concern about the process and recommendations are attached.

We understand the pandemic has made it difficult to engage in a standard stakeholder process over the past year. Given the importance of this issue and the potential for significant adverse impacts, we recommend DWR put its recommendations on hold and conduct additional studies with a robust stakeholder process. Since DWR is not recommending changes to the standards until 2025, allowing additional time to formulate a strategy with stakeholders and develop recommendations that accurately reflect conditions throughout the state is reasonable. We are committed to continuing to work collaboratively with DWR, the State Water Resources Control Board, and other stakeholders in a science-based process to address the areas of concern and develop appropriate recommendations for indoor use.

Sincerely,

Clifford C. Chan

CCC:AET

Enclosure

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . (510) 287-0101

Enclosure

EBMUD Comments on DWR Draft Report

Inadequate Process

Since the enactment of AB 1668, EBMUD has been interested in participating in a collaborative stakeholder process and sharing our experience and expertise as a leader in water conservation. However, to date, the outreach to stakeholders including water, wastewater, and recycled water agencies has been lacking. At the April 22, 2021 meeting, DWR staff presented the draft recommendations without providing the opportunity for stakeholders to review the results of the indoor water use studies and provide meaningful input to inform the draft standard prior to its release. The May 21, 2021 Workgroup meeting also did not provide an opportunity for discussion of the development of the standards; rather, DWR asked stakeholders to identify potential solutions to the impacts caused by the recommended standards. This approach is not consistent with the statutory requirement to collaborate with stakeholders in the *development* of the recommendations, instead merely allowing stakeholders to comment on the recommendations after the fact. There remain many questions about DWR's methodology and how it arrived at the recommended standards.

Similarly, AB 1668 requires, "an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling, and reuse systems, infrastructure, operations, and supplies." Again, DWR has not met this requirement. The Draft Reports states that "a quantitative analysis is beyond the scope of this study," instead of relying on a qualitative analysis based on interviews with four agencies and prior assessments conducted by the California Urban Water Agencies (CUWA) in 2017. This is not adequate or appropriate, given the potential for significant impacts to water, wastewater, and recycled water supplies, systems, and operations.

Ignores Economic Impacts and Effect on Affordability

The Draft Report acknowledges that "the studies did not analyze potential economic impacts." Additional studies are needed to evaluate the potential impact on affordability.

Reduced flows will require changes to operations, maintenance, and infrastructure, and may result in a substantial increase in costs to treat and deliver and water. The Draft Report identifies several potential adverse impacts to water and wastewater utilities and recycled water programs resulting from reduced flows. Many of these would require operational changes or additional investments in infrastructure to ensure continued operation and eliminate threats to public health. For example, the Draft Report identifies that a reduced indoor standard could lead to stagnation in water storage facilities, necessitating capital investments to decrease the size of facilities and operational changes such as increased flushing, additional chemical usage, and increased maintenance.

EBMUD Comments on DWR Draft Report

Disproportionately Impacts Disadvantaged Communities

The affordability issues identified above are a significant concern for EBMUD, as raising rates to mitigate unintended consequences will disproportionately impact disadvantaged communities, including low-income residents and people of color.

Water affordability remains a top priority for EBMUD, especially the cost of water for low-income customers. We have extensive experience in supporting the most vulnerable through our Customer Assistance Program (CAP). In place since 1987, EBMUD's CAP is frequently cited as a model in providing rate assistance to low-income customers. As a result of economic conditions related to COVID-19, enrollment in the CAP program has increased by approximately 25 percent since the start of the pandemic. We are concerned that the economic impacts described above could further exacerbate the existing affordability crisis in California.

Endangers Public Health Protections

The Draft Report also identified deterioration in water quality as a potential impact. Increased retention time in the water distribution system could lead to public health and safety issues due to the formation of disinfectant byproducts and increased microbial activity. At the April 22, 2021, Water Use Studies workgroup meeting, DWR staff suggested that these issues require utilities to invest "time and money" to resolve them. These impacts should not be underestimated, as they would require significant operational changes and capital upgrades to address. Furthermore, the U.S. Environmental Protection Agency is currently reviewing and seeking public comment on potential revisions to the Microbial and Disinfection Byproducts Rules.

Ignores the Real and Lasting Consequences of Global COVID-19 Pandemic

The Draft Report does not consider the fundamental and lasting societal shifts caused by the global COVID-19 pandemic. The Draft Report recognizes that the statewide shelter in place order led to an increase in indoor residential water use of approximately 3.0 to 12.2 gpcd, but the recommended standards do not take into consideration the potential for long-term shifts in water use as more people switch to teleworking. This shift could be significant for some agencies, particularly those like EBMUD with significant numbers of residents who previously commuted to work. Numerous Bay Area employers – such as Google, Facebook, Salesforce, and Twitter – have announced that employees may continue some level of teleworking post-pandemic. A recent study highlighted by the San Francisco Chronicle identified that 31 percent of Californians surveyed hoped to continue permanent teleworking, and another 50 percent intended to split their time between home and the office.[1]

[1] Bobrowsky, M. (2021). 'In "seismic shift," a lot of Californians want to work from home and pandemic ends.' *San Francisco Chronicle,* April 19. Available at: https://www.sfchronicle.com/health/article/In-seismic-shift-a-lot-of-Californians-16113421.php

These societal changes would cause a shift in water use, as some portion of daily water consumption that previously would have occurred in the commercial sector would now take place in a residential setting. These impacts need to be better understood and quantified before the standards for indoor use are modified.

Hinders Water Recycling Programs

The recommended standards would have adverse impacts on recycled water programs, putting them in conflict with the existing State goal of increasing recycled water to 2.5 million acre-feet a year by 2030.

For EBMUD, the recommended standards could impact recycled water quality in ways that negatively affect our customers. Declining flows, coupled with a constant load, result in higher concentrations of contaminants such as salts and ammonia. Higher salt concentrations can potentially affect customers that use recycled water for landscape irrigation, as plants sensitive to high salt concentration can be harmed. High ammonia concentrations also limit industrial customers who have a desire to use recycled water but require water quality above and beyond the requirements of Title 22.

The recommended standards could also impact recycled water supplies. EBMUD's long-term planning for its recycled water program spans decades. Many projects already in place were designed based on the expectation of a certain level of wastewater flows, and reductions in flow could require EBMUD to secure supplemental supplies to meet the needs of existing recycled water customers. This would result in increased costs, and in some cases, EBMUD may need to use potable water to supplement recycled water supply during peak demand periods. For example, in the case of EBMUD's two industrial recycled water projects in Richmond – the North Richmond Recycled Water Project and the Richmond Advanced Recycled Expansion (RARE) Water Project – declining wastewater flows have caused EBMUD to supplement its recycled water with potable water to meet its contractual obligations. The need to serve existing recycled water customers could negate some of the conservation benefits of a reduced indoor standard if supplemental potable water is needed.

Questionable Feasibility

The Draft Report did not adequately assess whether the recommended standards are even feasible given the success of rebate programs and code changes in establishing the current baseline of indoor water use.

EBMUD has made significant investments in water conservation since its first Water Conservation Master Plan was published in 1994. Many of its initial conservation programs focused on reducing indoor water use, using rebates and other incentives to encourage efficiency in appliances and fixtures. EBMUD was successful in these efforts and eventually discontinued several rebate programs due to market saturation. For example, EBMUD allowed its rebates for

high-efficiency toilets to sunset in 2016, as it had estimated that market saturation for these toilets was greater than 80 percent, and code updates meant that all new toilets purchased by customers would be water efficient. Similarly, EBMUD also discontinued its clothes washer rebate program in 2016 due to improved efficiency standards.

DWR's assumption that a significant reduction in indoor water use can still be expected through passive savings (i.e., natural replacement) does not consider the significant investment in programs like toilet and clothes washer rebates that EBMUD and other agencies have undertaken. Given the success of these programs, there may not be as much outstanding passive savings in EBMUD's service area as DWR assumes.

EBMUD has invested heavily in indoor conservation programs, to the point where, like many agencies, we have found it is more cost-effective to shift the focus of our conservation efforts to outdoor water use. The cost-effectiveness and feasibility of reducing the indoor standard should be weighed against achieved increased water efficiency in other sectors.

Approach that Fails to Consider Other Factors

Making Water Conservation a California Way of Life established high-level, aggregate goals for water agencies that considered several components – indoor water use, outdoor irrigation for residential and dedicated irrigation meters, and water loss. DWR is setting the indoor standard without adequately considering holistically the other components of the legislation. EBMUD recommends that DWR consider the entire framework when evaluating the indoor standard and pursue improvements in water use efficiency where it makes the most sense to do so.

In addition, it is not clear that DWR's process of selecting the recommended standards truly meets the definition of efficient indoor water use. The proposed standard of 42 gallons per capita per day represents the 25th percentile of the current 2020 baseline. More work needs to be done to determine if this or some other number truly represents efficient water use in the context of current residential water use in California.

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th Street
Sacramento, CA 95814

Submitted via Electronic Mail:
WUEStandards@water.ca.gov

Subject: Indoor Residential Water Use Study Report Comment Letter

Dear Department of Water Resources:

Eastern Municipal Water District (EMWD) appreciates the opportunity to provide input on the Department of Water Resources (DWR) draft Report on Results of the Indoor Residential Water Use Study (Report). EMWD would like to acknowledge the work that DWR has done to-date, as we know this has been a significant undertaking. We also recognize the importance of establishing indoor water use targets that help support the implementation of current conservation legislation. However, our support for the legislation in 2018 was predicated on analyses that quantify how changes to the indoor water use target could impact water supplies and systems, wastewater systems, and recycled water.

EMWD provides water, wastewater, and recycled water within a 555-square mile service area and to a population of more than 850,000. EMWD is the 6th largest retail water agency in the State of California, and changes to the indoor water use standard will have significant impacts on all three of the services that EMWD provides for communities in western Riverside County. EMWD has the following comments on the Report accordingly:

1. **The study may not reflect census tracts with multiple sources of water, resulting in estimates of residential indoor water use being artificially low.** EMWD was one of the 18 suppliers that provided customer-level data to support DWR's study of current indoor residential water use. While reviewing the preliminary results provided by DWR, EMWD commented that there was potential for inaccurate water use assigned to areas supplied by multiple sources of water. This is an area of concern for EMWD, as there are census tracts within the service area that are possibly served by multiple sources of water. As a retail and wholesale water supplier with a service area that is still primarily

2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300
T 951.928.3777 • F 951.928.6177 www.emwd.org

undeveloped, there are census tracts where different portions could be served by a combination of private groundwater wells, EMWD retail service, or service from one of EMWD's sub-agencies. Furthermore, there may be cases in EMWD's service area where multiple sources of water could supply just one individual property – for example, a single-family residential home on a dairy may be supplied by a private well, in addition to potable EMWD water. In these cases, estimates of residential indoor use may be artificially low unless all possible sources of supply are accounted for, as residents may only be using potable EMWD water to supplement their own supply. It is unclear how the draft Report considers these circumstances.

2. **Impacts to wastewater need to be better understood and quantified.** Report Table 6-2.b acknowledges potential adverse impacts for wastewater utilities resulting from lowering of the residential indoor gallons-per-capita-per-day (Ri-GPCD). EMWD has been experiencing these adverse impacts since 2014, as our water use drastically declined, as a result of the emergency drought regulations and has yet to return to pre-2014 levels. EMWD operates four water reclamation facilities that treat approximately 45 million-gallons-per-day (MGD) of wastewater. We have continued to experience lower, more concentrated wastewater flows that have resulted from on-going water use efficiency. Our per capita water use remains 15 percent below what it was prior to the 2014 – 2016 emergency drought declaration and this has had significant impacts on our wastewater system including the following:

   - *Increased total dissolved solids (TDS)* has increased in our recycled water which could have adverse impacts on our groundwater basin, requiring costly mitigation in the future to comply with Basin Plan requirements.

   - *Increase in grease and solids concentrations* which have resulted in increases in sanitary sewer overflows and collections system maintenance. EMWD fortunately has had the resources to deploy to respond to the overflows and increased cleaning requirements; however, further increasing these occurrences places the environment and the public at risk. Additional costs can also be expected for staff and equipment to increase the frequency of sewer cleaning activities.

   - *Increased chemical costs* as more chemicals are required to be added to the collection system to treat foul odors. As the flows decrease and wastewater concentrations increase the production of hydrogen sulfide will also increase. This will cause a public nuisance due to odors and will also cause physical damage to manholes and some types of pipelines. To mitigate the hydrogen sulfide production, substantial amounts of chemical will need to be added to the collection system. This is very costly and adds more TDS to the recycled water supply.

We are still trying to fully understand the impacts of EMWD's current residential indoor water use that, based on the DWR study, is estimated at approximately 50 GPCD. We have performed updated wastewater modeling and determined that our plants require re-rating due to the changes in flows and concentrations. Studies are on-going to better understand the long-term impacts on our facilities and planned future infrastructure improvements that take years to implement. Reducing the Ri-GPCD even more without the proper understanding of impacts to wastewater systems further exacerbates the challenges we are already seeing at 50 GPCD.

3. **Impacts to water supply portfolios, including increased reliance on imported water from the loss of recycled water supplies, needs to be assessed.** Report Table 6-2.c acknowledges the potential adverse impacts for recycled water projects from reduced Ri-GPCD. This is a significant concern to EMWD, as recycled water is a critical part of EMWD's water supply portfolio. EMWD has made significant investments in wastewater treatment plant upgrades, along with investments in conveyance and storage infrastructure to offset EMWD's reliance on imported water. EMWD has also reduced pumping of our groundwater basin, which is defined as a high-priority basin under the Sustainable Groundwater Management Act. Today, recycled water makes up almost 40 percent of EMWD's retail water supply, and EMWD continues to invest in this resilient water supply.

   EMWD values recycled water as a resource, and similar to the value we place on other water supplies, have implemented water efficiency measures on that recycled water use. For example, we have worked for the past few years with Cal Poly San Luis Obispo and our local farming community on water use efficiency opportunities. We also established criteria in our recycled water retrofit program that includes a requirement for removal of non-functional turf, in order to qualify for the incentives associated with the recycled water retrofit program. This commitment to water use efficiency, even with our recycled water use, has resulted in a 50 percent reduction in recycled water use per meter since the inception of the program. Even with that reduction, EMWD still regularly achieves 100 percent beneficial use of our recycled water, meaning we are already using all we have.

   The lowering of the indoor water use target from 50 GPCD to 42 GPCD, is a 16 percent reduction, which equates to over 5 MGD in lost recycled water supply for EMWD in 2030, meaning that EMWD may need to augment its water supply portfolio with additional imported water to meet projected demands. This is counter to EMWD's and the region's progress in reducing reliance on the Sacramento-San Joaquin Bay-Delta (Bay-Delta). Before a further reduction in the Ri-GPCD is recommended, the amount of imported water that would be needed to replace the loss of recycled water needs to be quantified.

4. **Historical residential indoor water use behavior may not be indicative of future water use behavior due to evolving work arrangements.** EMWD is also concerned that the study recommendations (which utilize analyses of historic water use behavior to approximate indoor water use) may not be

indicative of future water use behavior. While this possibility is acknowledged in Section 7, EMWD would like to emphasize that given the proliferation of the remote work environment over the past year due to the COVID-19 pandemic. The potential long-term ramifications impacting indoor water use behavior as many employers consider permanent hybrid or full remote work arrangements should be given full consideration before indoor water use standards are finalized.

5. **The study does not adequately evaluate the feasibility of additional gains in residential indoor water use efficiency.** While water use efficiency has been improving significantly on a statewide level, water suppliers with historically active and robust conservation programs may be close to a saturation point of high efficiency fixtures, effectively hardening the remaining indoor demand. Any lowering of the Ri-GPCD should also be considered in the context of the other components of the water use targets and ensuring that suppliers maintain the flexibility to meet their goals. To date, the various components of the water use targets are being developed relatively independent of each other, leaving uncertainty as to where suppliers need to invest in order to meet the targets and maximize cost-effective conservation options.

6. **A cost-benefit analysis should be performed to determine if lowering the Ri-GPCD is a cost-effective way to achieve the goals of Making Conservation a Way of Life.** The draft Report states, "*That water use efficiency is often less expensive than developing new water supplies and may help to ensure equitable and affordable access to water.*" However, this statement does not address the additional water supplies that may be needed to off-set lost recycled water supply, the additional costs associated with impacts to wastewater systems, and the cost and risks associated with suppliers having to re-allocate resources from other critical infrastructure projects that are necessary for the protection of the environment and public health. There has been an implication that the adverse impacts that have been acknowledged can be overcome with "time and money;" however, how much time and money is still unknown as the impacts have not been quantified. Upon quantifying the cost of the impacts, a cost-benefit analysis should be performed to determine if lowering the Ri-GPCD is a cost-effective way to achieve the goals of Making Conservation a Way of Life.

EMWD respectfully requests DWR to remove the recommendation for a residential indoor water use target until the comprehensive assessment on impacts on water, wastewater, and recycled water supplies and systems can be completed, and that the Report recommend additional studies accordingly. DWR can still meet the requirement established by the existing legislation by completing the study on indoor water use without making a recommendation, as there is not a requirement for a recommended standard to be included in the Report.

Thank you for considering EMWD's comments on the Report on Results of the Indoor Residential Water Use Study. If you have any questions regarding this correspondence, please feel free to contact me at (951) 928-6130 or by email at mouawadj@emwd.org.

Sincerely,

Joe Mouawad, P.E.
General Manager

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Avenue • Chino, CA 91708
P.O. Box 9020 • Chino Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-1985
www.ieua.org

June 4, 2021

Sent via email to: WUEStandards@water.ca.gov

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th Street
Sacramento, CA 95814

Re: Comments on the Public Review Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies

Dear Water Use Efficiency Branch,

On behalf of the Inland Empire Utilities Agency (IEUA), thank you for this opportunity to provide comments on the Public Review Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies (Draft Report). IEUA has supported cost-effective water-use efficiency efforts statewide as part of a multi-pronged strategy to assure water supply reliability and resilience in the face of unprecedented climate change challenges.

In addition to being a wholesale provider of imported water to our retail water agencies, IEUA also provides regional tertiary treatment services of wastewater, resulting in our region's ability to recycle 100% of the water used indoors and returned to the sewer. IEUA's recycled water plays a critical role in reducing regional reliance on imported water supplies by replenishing the Chino groundwater basin and efficiently irrigating climate appropriate plants in our inland climate.

IEUA and its member agencies have been leaders in promoting water-use efficiency. Since 2010, IEUA and its retail agencies have sponsored over $50 million in water-use efficiency programs resulting in cost-effective water savings. However, those familiar with the Pareto Principle (also known as the "80-20 Rule") understand that the last 20 percent of the effort will typically represent 80 percent of the cost. IEUA is concerned that the recommendation to reduce indoor water uses to 42 gallons per capita per day (gpcd) may cross into the last 20 percent of effort and flow impacts and, as such, the unintended financial consequences may have a disproportionally large impact on water and sewer ratepayers. We are especially mindful of these cost impacts considering our region's sizable investments in water recycling, which is a form of conservation.

Therefore, IEUA joins with ACWA (Association of California Water Agencies), CASA (California Association of Sanitation Agencies), and others in calling for additional time to comply with the statutory requirements of Water Code Section 10609.4 to:

1) Collaborate with, and include input from, water and wastewater agencies to work on the studies, investigations, and the ultimate report, and
2) Utilize more sophisticated analyses, such as comprehensive End-Use and Household Occupancy studies, to estimate the holistic impacts on water and wastewater systems that would result from reduced standards for indoor residential water use.

IEUA also recommends that DWR withdraw the joint recommendation for the indoor residential water use standard (Recommended Standard) included in the Draft Report and work collaboratively with stakeholders – including water, wastewater, and recycled water agencies – over the next six to nine months to analyze and quantify the impacts of a changed standard.

If allowed additional time, IEUA would appreciate having the opportunity to share findings with DWR from recently completed Return-to-Sewer studies, which would help to evaluate the total life-cycle costs that reductions in indoor water use below 50 gpcd would represent in different types of wastewater systems and then allow this analysis to inform the basis for a revised recommendation to the Legislature, if there is one.

Population Assumptions in the Draft Report are Concerning

An additional benefit from taking the time necessary to undertake a more refined analysis of the impacts from declining flows is that updated population data from the 2020 U.S. Census will become available later in 2021 and could be incorporated. As Section 2.2.8 of the Draft Report rightly notes, population is one of the most important numbers used in determining water use rates. Yet, the population data used in the Draft Report are deemed acceptably extrapolated from the 2010 U.S. Census.

Need to Incorporate Latest Understanding of Household Occupancy Trends

We are concerned that as housing prices in California continue to skyrocket, household occupancy rates will increase over time, particularly in disadvantaged communities, impacting per capita assumptions in residential water use. For example, the Draft Report does not refer to the impacts that Accessory Dwelling Units (ADUs) may have on per capita residential water use assumptions. Our understanding that recently added state laws aimed at streamlining the permitting process for the construction of new ADUs have promoted their viability and popularity. It is rare for new water or sewer meters/accounts to be added with the addition of an ADU on the property. Instead, the new occupants of the ADU share the existing residential water and sewer meters used by the occupants of the primary house on the property, increasing household water use without necessarily accounting for increased household size. This type of trend could impact the assumptions related to per household water use, yet not recognized

in the Recommended Standard. Further, it is unknown to us how such a trend would be accounted for in the California Department of Finance estimates related to population growth per community and if it might impact gpcd estimates.

With additional time, IEUA believes that the Draft Report would benefit from a door-to-door random sampling of people per household to confirm study assumptions related to household occupancy. The greatest need for confirmation is the assumption that the average number of people per household in households represented in the lowest quartile of water users does not vary from the average number of people per household in the higher water-using quartiles.

In other words, can the Draft Report definitively state that the lower water-use levels found in the lowest quartile of water users are not just a function of lower household occupancy rates? It seems possible that households with only one or two residents would essentially "self-select" into the lowest quartile of water users. If so, such low water use levels could not, and should not, be assumed to be achievable in households with more residents. This is an essential issue to be addressed in the Draft Report since water-use levels statistically observed in the lowest quartile of water users are used to justify the Recommended Standard.

Reporting the Impacts to Wastewater and Recycled Water Agencies.
Table 6-3.b of the Draft Report identifies and qualitatively describes a list of potential impacts that declining flows could have on wastewater and recycled water systems, including pipeline corrosion and higher treatment costs. However, it does not quantify these costs, which we believe it should have[1]. It is our understanding that these costs will be estimated in the formal rulemaking process, as is required by law, but without the benefit of stakeholder input. If a delay in the issuance of the Draft Report is granted, we respectfully request that the cost impact analysis currently being completed by the State Water Resources Control Board be included in the Draft Report and be allowed informal stakeholder review and comment. In this way, the final rulemaking process can be more broadly supported.

Additionally, while the Strata-Based Approach of the statistical analysis described on page 14 of the Draft Report yielded interesting findings regarding correlations between housing characteristics, etc. and associated levels of water use, no such analysis was completed to assess correlations between declining flows and impacts to wastewater and recycled water systems. Factors such as the age of the wastewater system, the diameter and slope of the wastewater pipeline, and the age of the housing

[1] Section 10609.4 (b)(1) of the California Water Code states… "The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies." A qualitive inventory of potential impacts, as represented in Table 6-3.b of the Draft Report, is not satisfactorily responsive in determining how these items will be impacted. The Draft Report should have undertaken a Triple Bottom Line analysis to represent impacts, both qualitatively *and* quantitatively.

stock can and should all factor into higher asset management costs for wastewater systems attributable to declining flows, as well as factor into higher treatment and other variable costs. Please consider how a revised Draft Report could represent more nuanced insights on the impacts that declining flows could have on different wastewater and recycled water system characteristics.

In conclusion, thank you for your thoughtful approach to establishing the new water-use efficiency regulations. The complexity of this endeavor is fully appreciated by IEUA. While the Draft Report is a good start, we believe that California's ratepayers will benefit from taking a bit more time to address the questions raised by IEUA and others.

Sincerely,
INLAND EMPIRE UTILITIES AGENCY

Shivaji Deshmukh

Shivaji Deshmukh, P.E.
General Manager

Irvine Ranch
WATER DISTRICT

VIA EMAIL: WUEStandards@water.ca.gov

June 2, 2021

Water Use and Efficiency Branch
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Subject: Residential Indoor Water Use Study and Standard Recommendations

Dear Water Use and Efficiency Branch:

The Irvine Ranch Water District (IRWD) thanks you for the opportunity to comment on the study and recommended changes in the water use efficiency standards for indoor residential water use presented at the April 22, 2021, Department of Water Resources (DWR) Stakeholder Workshop. As you are aware, IRWD has been a leader in implementing successful, cost-effective water use efficiency programs for the past three decades. For us and our community, conservation is a way of life.

Fundamentally, IRWD leads the way in water use efficiency efforts and supports the development of water efficiency standards. We believe that the data and assumptions included in DWR's indoor water use study have led to the development of recommendations that are misinformed, and if adopted will require costly and heavy-handed actions by water suppliers throughout the state. In our experience, heavy-handed actions are not nearly as effective in changing the long-term behavior of water customers as thoughtful, achievable programs.

While we recognize the tremendous challenge DWR has faced in evaluating appropriate indoor residential water use standards as required by Water Code Section 10609.4, we write to raise serious concerns about the process, the study approach, the achievability of the recommended standards, and the lack of a quantitative analysis performed on the resulting consequences should the recommended standards be implemented.

As a leader in water efficiency, IRWD urges DWR to pause, revise the study, and put California on a path to establishing data-driven, science-based, cost-effective indoor residential water use standards. To do this, additional studies and time are required, and the assumptions and decisions made to determine the recommended indoor standard must be revisited and revised.

With this data-driven, science-based, cost-effective approach in mind, IRWD specifically asks that the following be addressed before the indoor water use study is finalized and used to justify recommended revisions to the indoor water use standard.

Comments and Requested Action:

1) ***Stakeholder process concerns must be addressed, and true stakeholder input incorporated into the study.***

   Water Code Section 10609.4 requires that DWR collaborate not only with the State Water Resources Control Board (State Board), but with stakeholders on the studies, investigations and reports conducted to evaluate and recommend a standard for indoor residential water use.

   Collaboration, by definition, means cooperation and partnership in creating the studies, investigations, and reports. It requires more than simply allowing for input. It requires the opportunity to engage, discuss, and provide input on the study and the development of the recommendations along with a meaningful opportunity to discuss and debate the implications related to compliance with the overall urban water use objective. This collaboration required by the Water Code has not been made available to stakeholders.

   IRWD, like many other water agencies, has stood ready to engage in that type of collaborative process. As one of the 18 suppliers that provided data for DWR's indoor study, and as a member of DWR's Water Use/Indoor Studies Workgroup, IRWD has been waiting expectantly to engage in such a process. Unfortunately, the stakeholder process did not provide an opportunity for study participants or workgroup members to engage on the study methodology or in the development of the recommendation until DWR's report had been finished.

   Stakeholder input on the results of the studies and how the results could best be used to develop indoor standards was not solicited. In fact, only three stakeholder meetings were held—one on November 19, 2019, one on July 23, 2020, and one on April 22, 2021. The first meeting provided an overview of the workgroup process only. The second meeting consisted of DWR staff and consultants presenting on the indoor use study methodologies but did not allow for any discussion of the assumptions or data that would be used in the study. At the third and final meeting, DWR and State Board staff presented the indoor study results and recommended indoor standards, and only accepted 30 minutes of work group comments. It is important to note that the draft report had been finalized, but had not even been released at the time of the third meeting.

   This lack of collaboration contrasts dramatically with the collaboration between DWR and the State Board. According to the report, DWR had numerous and frequent meetings with State Board staff to discuss and engage on the study approach, results and the recommendations.

2) ***The lack of collaboration with stakeholders has resulted in the study not reflecting the "boots-on-the-ground" perspective.***

The lack of stakeholder collaboration is of particular concern because the study was not conducted in a meaningful, quantitative way that considered the real "boots-on-the-ground" perspective and expertise of stakeholders. As we have all experienced, academic exercises can often differ drastically from real world experiences.

Additionally, even though DWR did evaluate potential impacts in a qualitative way, stakeholders were not invited to provide any input on that analysis. Because of this lack of input, the recommended indoor standard fails to consider any of the potential impacts that DWR identified in its qualitative analysis.

This lack of meaningful stakeholder engagement has left a void in the data. Furthermore, the failure to consider the potential impacts has resulted in an unfounded recommendation justified by statements that make clear DWR undervalues the time and money constraints that water suppliers face.

IRWD recommends that the indoor standards remain unchanged until there is adequate stakeholder collaboration and opportunities to provide input on the development and impacts of the indoor standard as it relates to the water efficiency objective, and until a quantitative analysis can be conducted with water agency collaboration.

3) ***A good example of the impact of not considering the "boots-on-the-ground" perspective is the fact that the study's integrity and recommendations are undermined by the lack of consideration of indoor device installation saturation due to historical active water efficiency efforts.***

IRWD has implemented indoor water efficiency programs for over 30 years. In examining our success and the reasons for it, it is clear that IRWD' s residential indoor use is one of the lowest in the state. This is due to IRWD's long history of aggressive indoor conservation programs and the fact that its service area consists of a significant proportion of newer development that meets newer plumbing standards.

Prior to 2009, IRWD's indoor water use efficiency programs resulted in the replacement of approximately 14,000 toilets and provided countless showerheads and faucet aerators to customers. Since 2009, we have successfully replaced over 33,000 additional toilets through active programs, including rebate and direct install programs. These programs have targeted the oldest housing stock in our service area in order to replace the most inefficient fixtures. While they have been successful, we have transitioned away from enhanced indoor water efficiency programs because of the high level of indoor device saturation within our service area and the diminishing water savings returns we would see with further investment.

Many other agencies in the lowest 25th percentile have implemented similar programs. By not including data on these historical active water efficiency efforts, the study incorrectly overestimates the future water savings that can be achieved through passive conservation. This is because many of the older fixtures that would be replaced due to age have been replaced ahead of schedule and the water savings has already been reflected in the baseline data.

Furthermore, the passive savings reduction identified in the Mitchell report is based on a 2015 baseline. DWR did not account for the passive savings that already occurred between the Mitchell 2015 data and the DWR study period.

4) ***DWR needs to incorporate data on active conservation programs into its study and analysis.***

Although IRWD was a study participant, data were not requested regarding the active water efficiency programs we have implemented and that have accelerated plumbing fixture replacement. More importantly, information on active program water savings was neither included in the DWR report nor considered in the development of the recommended indoor standard.

The decision to set the standard at the 25th percentile without understanding the accelerated water savings already achieved by water suppliers through active water efficiency programs has most likely resulted in an unreasonable standard for most of the state.

DWR should collect data from California water suppliers to understand and analyze how active programs may have impacted the legitimacy of the passive water savings assumptions and the current levels of indoor water use included in the study. Additional time should be taken to collect and perform this data analysis to ensure a reasonable and appropriate indoor standard is recommended. Until this occurs, IRWD recommends that the indoor use standards remain at the current levels.

5) ***The demand hardening that has occurred in California's residential indoor water use and the diminishing water savings returns that would accompany further investments in that area must be recognized in any recommended indoor standard.***

IRWD has invested heavily in water use efficiency since the 1990's, and the majority of California water utilities have implemented active indoor water use efficiency programs for the past two decades. These historical efforts and the effect of passive conservation measures have contributed to indoor water efficiency demand hardening. This means that substantially greater indoor savings is less likely and the resources necessary to achieve greater savings will be costly. Because of this, many California water suppliers have shifted their focus from indoor fixture replacements to outdoor water use efficiency.

IRWD serves as a good example of this shift in focus from indoor to outdoor efficiency. IRWD's saturation rates for indoor measures indicate that there is limited opportunity for readily-obtainable, cost-effective increases in indoor water efficiency for much of the residential sector within our service area. IRWD's data show that older homes have similar

indoor water use to those in newer developments due to the effectiveness of IRWD's indoor device retrofit programs. Indoor water efficiency demand has hardened; there are no more cost-effective measures left to implement and customer interest has greatly reduced. Setting an indoor standard that is lower than what IRWD has already achieved through significant investments into active programs would not result in additional water savings from the indoor sector, and this holds true for many of the agencies in the 25th percentile.

IRWD recommends that the indoor use standards remain at the current levels until additional analysis on device saturation levels, active program implementation and cost-effectiveness can be analyzed.

6) ***The study does not adequately address the potential for negative consequences to recycled water systems or the state goal for expanding recycled water use if the indoor standards were reduced.***

IRWD has invested heavily in developing water supply reliability. These efforts have included development of local supplies, emergency supplies and the extensive use of recycled water. IRWD operates two recycled water treatment plants with a combined capacity of up to 35 million gallons per day (MGD). Presently recycled water accounts for 27 percent of the District's total water supply.

As a leader in recycling water, IRWD has invested in the development of state-of-the-art facilities to treat and transport this alternative supply, saving millions of acre feet of potable water for the past 60 years. Our recycled water system, along with our sewage collection system, was designed based on anticipated flows from each planned development and codes that were in place at the time of those developments. We have planned extensively for the future, and that future includes recycled water.

In fact, 84 percent of all business and community landscape areas within our service area are irrigated with recycled water, and we expect this to continue well into the future. IRWD has also invested in water use efficiency for recycled water and therefore there is little opportunity to reduce recycled water demands further.

Further reductions in indoor residential use would substantially reduce our recycled water supply and the supplies of many other recycled water producers. This is at odds with the state's goals for expanding recycled water use and will only serve to put greater pressure on imported supplies which will be needed to meet the demands currently met by recycled water supplies.

In addition to its recycled water supplies, IRWD pumps groundwater from the Orange County Basin, which is managed on behalf of 19 groundwater producers by the Orange County Water District (OCWD). OCWD is home to the Groundwater Replenishment System (GWRS), the world's largest potable reuse facility, which creates a new local supply of water used to replenish the groundwater basin. OCWD is already constructing the final expansion of the GWRS to increase production from 100 MGD to 130 MGD — enough water for one million people. Ratepayers from IRWD and the other 19 producers will have invested $920 million into local water supply reliability once the GWRS final expansion project is complete.

DWR's recommended standards could result in insufficient flows being available to the GWRS that would prevent the treatment of 130 MGD of wastewater and result in a reduction in available local water supply. A significant amount of reuse infrastructure could become stranded resulting in the waste of large amounts of ratepayer money. OCWD could now be penalized for proactively working to reuse local wastewater and improve local water supply reliability. Other more costly supplies would need to be purchased to supplement shortfalls in recycled water and groundwater supplies.

The potential for stranded assets was presented in the report as an acceptable outcome of reduced flows. It is inefficient and costly to under-utilize a recycled water or potable reuse system due to changes in the indoor standards. This means that assets will be stranded, and costs increased for minimal water savings. Stranded assets should not be considered an acceptable outcome without the benefits greatly outweighing the costs.

Without robust evaluation of the impacts of reduced flows on collection, treatment, and storage of recycled water and within the context of other state goals and regulations, the indoor standards should not be lowered. This is a zero-sum game. The demands will not decrease; they will simply shift from recycled or potable reuse water to other more expensive supplies, including imported potable water.

IRWD recommends that DWR conduct the studies required in the legislation, in particular analyzing quantitative impacts to the availability of recycled water, the GWRS and other reuse projects throughout the state.

7) ***Affordability and the human right to water are important, and DWR's study did not give full consideration to the impacts on ratepayers, water quality, project planning and financing, or compliance with other state-imposed requirements. Each of these impacts affordability and the human right to water.***

DWR's study and recommended indoor standard does not adequately address the issue of affordability and the human right to water. Time and money are real constraints at both the utility level and at the ratepayer level.

When examining affordability and the human right to water and the impacts of a change in the indoor standard, it is important to look beyond how those changes would impact disadvantaged communities (DACs). While DAC's are often where the issues of affordability and the human right to water are easiest to see, it is important to remember than nearly one-third of Californians are at 200 percent of the federal poverty line or below.

This means that the issues of affordability and the human right to water are issues in every community. As an example of this, while IRWD is generally not thought of as a DAC, almost 25 percent of IRWD's customers are below 200 percent of the federal poverty level.

The study should address concerns about affordability and the human right to water resulting from the increased costs that water suppliers would have to pass through to all ratepayers due to potential adverse impacts. These impacts should be considered prior to and factored into recommending any changes to the indoor standard.

Concluding Comments:

The intent of the "Making Conservation a California Way of Life" legislation is for California to have a reasonable water efficiency standard for indoor and outdoor water use. A water efficiency-based standard is not the same as a standard based on conservation or what may be technologically feasible. Because the indoor standard is one component of a water supplier's overall water efficiency objective, it is important that DWR take the time to obtain the data and effectively evaluate the impacts of modifying the indoor standard. DWR's study and recommendation must also consider and factor in all of the potential impacts.

Because of this we believe additional time is needed to obtain data and conduct the required studies. In the interim, the legislation already provides a stepped down approach to the indoor water use standards and will result in greater savings than 20 by 2020.

Again, we thank you for the significant time and effort you have taken to consider the indoor water use standard recommendation, and we thank you in advance for considering our concerns and for addressing the issues we have raised. We look forward to continuing to work with DWR to conduct the additional studies and develop appropriate recommendations on the indoor water use portion of the objective as warranted.

Sincerely,

Paul A. Cook, P.E.
General Manager

LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

June 4, 2021

VIA EMAIL: WUEStandards@water.ca.gov

California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Dear Sir or Madam:

IRWUS Report Comment Letter -
Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies

The Los Angeles County Sanitation Districts (Sanitation Districts) serve the wastewater collection and treatment needs of approximately 5.6 million residents in the Los Angeles Basin, Santa Clarita Valley, and Antelope Valley. We operate eleven inland water reclamation plants and the Joint Water Pollution Control Plant (JWPCP) for secondary treatment and ocean discharge. The Sanitation Districts have a long history of water recycling, encompassing almost sixty years. Currently, almost 900 individual sites served by approximately three dozen water purveyors use over 100,000 acre-feet per year (AFY) of tertiary treated recycled water for non-potable applications, such as urban landscape irrigation, agriculture, industrial process water, and potable uses, such as groundwater replenishment. Since the inception of our program in 1962, the Sanitation Districts have delivered over one trillion gallons of recycled water for reuse. Nearly all the flow from our inland water reclamation plants is now put to beneficial use or will be in the future as a result of planned projects. In our continuing efforts to maximize the beneficial reuse of all recycled water produced, the Sanitation Districts have partnered with Metropolitan Water District of Southern California (MWD) to develop the Regional Recycled Water Program (RRWP) – a project that will produce and deliver up to 166,000 AFY of purified recycled water from the JWPCP to the region's groundwater basins, industrial facilities and potentially other direct potable uses.

While the Sanitation Districts support continued efforts by the Department of Water Resources (Department) and the State Water Resources Control Board (SWRCB) to conduct studies and investigations on the best practices for indoor residential water reuse, the Sanitation Districts have several concerns with the Draft Report to the Legislature on the Results of Indoor Residential Water Use Studies (Draft Report) released by the Department on May 11, 2021. The Draft Report recommended significantly lower indoor water use objectives from a target of 50 gallons per capita daily (GPCD) by 2030 in the 2018 Water Conservation Act to a target of 42 GPCD by 2030. The implementation of such standards may have severe consequences for the Sanitation Districts' ability to continue to supply recycled water for existing and planned projects as well as interfering with our mission to protect water quality and the environment. Moreover, from a statewide perspective, there may be other unintended consequences of further conservation including reduced recycled water supply, reduced habitat, and degraded water quality that should be fully evaluated and quantified before a decision is made to move forward with mandatory conservation as described more fully below.

Reduced Water Supply

Water and Wastewater agencies long ago recognized recycled water as an asset and a key component of the state's water supply portfolio. Wastewater derived from indoor water use is generally of higher quality than industrial flows and thus is suitable for reclamation. This asset is already in wide use throughout the state and many additional projects are in progress for the future use of far greater quantities. As the amount of recycled water that is available is reduced over time, as described more fully below, another source of water would have to be found to meet these needs. Thus, the Department should fully quantify the lost recycled water supply and account for it in your estimates of water supply yield associated with proposed conservation measures. As impacts in reduced supply are added up statewide, they will significantly reduce the expected supply benefits of further conservation. The Sanitation Districts suggest that the Department work with California WateReuse Association and California Association of Sanitation Agencies (CASA) to quantify the expected loss in existing water supply under various potential target levels for indoor water use. Furthermore, if there are no other water sources available to replace actual and planned recycled water uses, then the resulting impacts on the state should also be quantified.

Existing Recycled Water Projects and Stranded Assets

As stated above, the Sanitation Districts supply to our partner water agencies on average approximately 100,000 AFY of recycled water. This supply is derived from our inland water reclamation plants. Distribution and use systems from the reclamation plants were constructed by our water agency and municipal partners over many decades to supply a myriad of uses throughout the region, usually displacing potable water use for irrigation, industrial supply, and groundwater replenishment. In most cases, the supply of recycled water from our water reclamation plants is either fully allocated to users or must continue to be discharged to inland surface waters to maintain habitat as detailed further below. We estimate that the proposed reductions if not offset by population growth would result in approximately 20% less recycled water production at our water reclamation plants and approximately 15% reduction in existing recycled water use or 15,000 AFY in lost water supply. The Sanitation Districts would be forced to reduce supplies to our customers and our customers would not be able to serve their customers' needs. Millions of dollars in recycled water conveyance assets, paid for in large part with state and federal grants and ratepayer funds, would be stranded. Water Agency customers would need to identify new potable water supplies to offset these demands.

Planned New Recycled Water Projects

In addition to existing projects, many new recycled water projects are in various states of planning and implementation throughout the state, including large scale potable reuse projects. These efforts are consistent with the goals in SWRCB's Water Quality Control Policy for Recycled Water (Recycled Water Policy, most recently amended in 2018) to maximize the use of recycled water and tripling the rate of water recycling between 2015 and 2030. The prospect for reduced availability of recycled water due to future conservation must be included in any planning effort. Planning for new recycled water projects is already extremely challenging due to the need for extensive new infrastructure and associated costs. The inability to predict available flows accurately, compounded by the likelihood of additional future conservation mandates, may cause project sponsors to either back away from or downsize new projects to avoid risks, or unintentionally oversize the infrastructure, resulting in more stranded assets.

For example, the planned RRWP is expected to produce 166,000 AFY of purified water and will cost approximately $3.4 billion to build. In order to produce this much recycled water, the Sanitation Districts must provide a steady recycled water flow of 185 million gallons per day (MGD) all day long. Available flows at the JWPCP are about 250 MGD on average but are typically lower than 185 MGD at night and thus some large-scale storage or flow equalization is contemplated as part of the project planning. If flows are reduced due to conservation, it may not be economically feasible to construct all the additional storage needed to ensure adequate flows to the RRWP. The RRWP production would then be reduced during the lower flow portions of the day and either the unit cost for purified water would increase or the rated capacity would be reduced to match the available

flows. The results would be lower production and higher costs. MWD and the Sanitation Districts are currently updating projected availability of recycled water and its effects on the sizing of the RRWP.

The proposed standards also pose similar risks to the ongoing collaboration between the Sanitation Districts and the Water Replenishment District of Southern California to use approximately 10,000 AFY of tertiary treated recycled water from the Sanitation Districts' Los Coyotes Water Reclamation Plant (LCWRP) for the expansion of the Leo J. Vander Lans Advanced Water Treatment Facility. As influent flows to LCWRP decrease due to conservation, inadequate supplies of recycled water may result.

Incidental recharge and Habitat Maintenance

Much of the recycled water generated from indoor water use in California is treated and discharged to inland surface water bodies. These flows contribute to instream flows that support habitat and replenish groundwater supplies. A reduction in recycled water supply will result in impacts to receiving waters and impact water supplies.

The Sanitation Districts' inland discharges significantly augment flows in inland rivers in Los Angeles County. Our reclamation plants were designed to supply municipal reuse with interim river discharge until infrastructure to use it is built. The ongoing discharge often creates habitat in effluent dependent waterbodies or incidentally recharges groundwater. Two examples illustrate the importance of these flows to water supply and habitat. In the Santa Clara River watershed in northern Los Angeles County, the Sanitation Districts discharge approximately 20,000 AFY of recycled water. In our consultations with the California Department of Fish and Wildlife (CDFW) regarding proposed reduced discharges to the river to accommodate a proposed recycled water project, CDFW determined that any reduction in discharge may affect the unarmored three-spine stickleback fish, a state and federally listed species. In light of these concerns and subsequent litigation, the Sanitation Districts abandoned all efforts to reduce discharges to support recycled water projects. Furthermore, recent studies commissioned by the Santa Clarita Valley Groundwater Sustainability Agency have identified recycled water discharges to the Santa Clara River are a key component of groundwater supplies and must be considered in the region Groundwater Sustainability Plan.

On the San Gabriel River, the Sanitation Districts recently completed a multi-year process with the State Water Resources Control Board to obtain approval of Water Code Section 1211 petitions to reduce discharges to the river from five of our water reclamation plants. The amount of recycled water the Sanitation Districts was ultimately required to continue to discharge was determined by the SWRCB in consultation with CDFW and stakeholders to carefully balance water supply and habitat needs. However, it is our understanding that under State law, the minimum flow requirements may not apply to the Sanitation Districts in the future if the recycled water supply is simply not available. This will place the Sanitation Districts and the State in the difficult position to have to choose between reductions in flows to support habitat or additional reductions to existing recycled water customers.

Water Quality Affects Demand

As described more fully below, water conservation will increase the concentration of salts in indoor wastewater and the resulting recycled water produced from it. Recycled water quality is often a concern for customers in terms of the salt content, which can interfere with plant growth when used for irrigation and affect industrial uses such as cooling towers. In some cases, these impacts can be mitigated through the use of additional irrigation amounts to leach salts or more frequent blowdown in cooling towers, but this is not always the case and there may not be additional quantities of recycled water available for this purpose.

Use of recycled water for indirect potable reuse projects involving groundwater recharge could be affected if recycled water salt concentrations exceed water quality objectives for the groundwater basin. Consistency with salinity and nutrient management plans prepared in accordance with the Recycled Water Policy must also be considered when new projects using recycled water are considered.

In general, higher salt content will reduce the demand for existing and future uses of recycled water. This has been demonstrated at the Sanitation Districts' own facilities where water agency customers prioritize use of recycled water from the water reclamation plants producing recycled water with lower salt levels higher in the watershed.

Impacts to Recycled Water Quality and Sewerage Operations

The revised indoor residential water use standards proposed in the Draft Report are expected to negatively impact influent wastewater quality that could pose wastewater treatment and water recycling challenges. Increases in concentrations of biochemical oxygen demand (BOD), total suspended solids (TSS), ammonia, and anthropogenic chemicals of concern in sewage have been observed as a result of past conservation efforts, and the proposed lowering of the indoor residential water use standards will further concentrate these pollutants in sewage. Conservation causes degradation of wastewater quality because loadings of pollutants into the sewer system remain unchanged, but the volume of water diluting pollutant concentrations decreases. The Draft Report briefly mentions increasing contaminant concentrations in wastewater as a potential adverse impact to wastewater utilities as a result of the proposed standard; however, it does not provide a quantitative assessment of degradation in wastewater quality and the associated cost, energy, and spill risk. Again, the Sanitation Districts suggest that the Department fully quantify these impacts when considering new regulations.

Impacts to Wastewater Collection Systems

Unintended consequences of conservation to the wastewater collection systems and the operation of the wastewater treatment plants have accelerated in the past two decades as conservation efforts intensified. The reduction in flows has resulted in higher concentrations of solids and nutrients in the wastewater that cause odors and blockages in the collection systems. More chemicals than what was used in the past must be applied to minimize odor and prevent corrosion in the pipes. The additional chemical usage is not only costly but also creates challenges to the treatment processes, which will be further explored under impacts to water quality and treatment plant operations below.

Existing collection systems were designed to convey sewage at self-cleaning velocities based on the design flows they were intended to carry. The buildup of solids in the sewers that may result from loss of flushing flows could result in additional sewer blockages and spills. An increase in sewer maintenance and cleaning activities, including flushing, will be required to prevent blockages that could lead to sanitary sewer overflows. The use of potable water for flushing would be contrary to the intent of the Draft Report.

Impacts to Wastewater Treatment Systems

Due to the implementation of both mandatory and voluntary conservation measures, the Sanitation Districts' overall effluent production has dropped by about 33% in the past 30 years, despite a population increase of 1.5 million people. During the past decade alone, concentrations of waste solids content as measured by BOD, TSS, and ammonia have increased by 20-40%. More concentrated influent wastewater negatively impacts capacity as well as energy and cost efficiency per volume treated for conventional wastewater treatment plants. Additionally, further degradation of wastewater quality, particularly with respect to salts, nutrients, and anthropogenic compounds that pose potential health concerns, could require wastewater utilities to implement costly and energy-intensive treatment process upgrades in order to prevent adverse impacts to surface waters, groundwater, and reuse applications.

In regard to salt levels, a Southern California Salinity Coalition study[1] conducted in 2018 estimated that for every 1 GPCD decrease in indoor water use, wastewater total dissolved solids (TDS) concentrations are

[1] Daniel B. Stephens & Associates, Inc., 2018. Study to Evaluate Long-Term Trends and Variations in the Average Total Dissolved Solids Concentration in Wastewater and Recycled Water. March 30, 2018. Funded by the Southern California Salinity Coalition.

expected to increase 1.2 to 1.7 mg/L. TDS is not removed in conventional wastewater treatment processes. Advanced treatment, such as reverse osmosis (RO), could be required to meet surface water discharge requirements or to sustain beneficial uses of recycled water, such as irrigation, industrial uses, or groundwater recharge. In addition to high costs and power consumption, RO produces concentrate that is high in TDS. Concentrate disposal in inland areas is cost-prohibitive. Marine disposal of RO concentrate must be carefully managed to avoid impacts to aquatic life and poses feasibility challenges for inland communities in particular.

The Draft Report cites a Brown and Caldwell study indicating the benefits of further conservation may include reduced power consumption for pumping and deferred capital expenditures to meet new capacity needs. From the Sanitation Districts' experience, variable costs related to flow in operation facilities are only approximately 25% of overall costs; remaining costs are fixed irrespective of flows. Further, pumping constitutes only 15-20% of our power consumption at our reclamation plants. Lower flow does not necessarily mean avoided capital to accommodate new residents. Flow is only one component in the rated capacity determination of a wastewater treatment facility. Much of the rated capacity is determined by the design flow and solids load, and conservation does not affect the solids load. The treatment plant investments needed to address higher strength and salt levels that may be required as described above would far exceed any potential savings in rated flow capacity design needs. The true cost to wastewater treatment facilities to adapt to conservation should be studied in detail and considered with all other impacts of the proposed standards.

Summary

Most indoor residential water use ends up in the wastewater collection system, is treated, and becomes a renewable water supply. This recycled water is already a significant portion of the water supply, approaching 10% in Los Angeles County. Therefore, a reduction in indoor residential water usage is indirectly a reduction in California's water supply and would have the opposite effect of the proposed measures. Reduced recycled water production may also require agencies to procure water from another source, such as imported water, if available to meet demand that was previously met solely with recycled water. Additional conservation mandates could inadvertently discourage new recycled water projects, which contradicts the water recycling goals in SWRCB's Recycled Water Policy. As such, a study that considers the net water supply benefit after loss of recycled water supplies as compared to all the wastewater treatment and water quality impacts that may result is warranted to provide decision makers a complete picture in light of other state priorities.

In conclusion, the Sanitation Districts urge the Department and the SWRCB to delay finalizing the Draft Report, allow additional time to analyze these impacts, and if appropriate, adjust the targets for indoor water use objectives to balance these impacts with the potential benefits of conservation. If you have any questions or require additional information, please contact me at rtremblay@lacsd.org or at (562) 908-4288, extension 2701.

Very truly yours,

Raymond Tremblay

Raymond L. Tremblay
Department Head
Facilities Planning

RLT:pb

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Manager

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th Street, Sacramento CA 95814

Dear Water Efficiency Branch,

Response to The Department of Water Resource's Indoor Residential Water Use Study

The Metropolitan Water District of Southern California (Metropolitan) recognizes the considerable efforts of the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB) in preparing the *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study* (Report). Metropolitan supports the overall goals of the *Making Water Conservation a California Way of Life* legislation and the intentions of the *Indoor Residential Water Use Study* to set standards for urban retail water suppliers. Water use efficiency and securing water reliability for the future are essential components of Metropolitan's long-term water supply planning.

Metropolitan greatly appreciates the opportunity to participate as a stakeholder as DWR and the SWRCB draft standards for residential indoor water use to the Legislature, At this time, we would like to share our comments regarding the feasibility of conforming to the proposed standard and the need for a quantitative assessment of potential impacts to water suppliers if a lower standard is adopted.

Assumptions and Methodology

DWR and the SWRCB should reexamine two methodological assumptions used in the initial feasibility assessment of water suppliers complying with the proposed standards. These initial assumptions may have biased the study results:

(1) The use of "passive conservation" estimates to support the feasibility of suppliers to achieve compliance.

The Report assumes that changes in this standard occur upon property sale and during the building permit process. However, this assumed saturation rate is likely overestimated. Enforcement rates of the laws governing appliance replacement, for example, vary throughout the state and can be expected to be as low as the enforcement rate of similar statutes such as the Water Efficient Landscape Ordinance which currently has an enforcement rate of less than 50 percent

Additionally, passive conservation could differ for water agencies with new housing development and redevelopment in more affluent areas but not for water agencies serving areas that are built out, have older infrastructure, older populations or are less affluent. Under these circumstances, the turnover rate assumptions for passive conservation vary. This homogeneous passive conservation assumption fails to assess the additional conservation efforts needed for the remaining suppliers to achieve compliance.

For the standard to reflect best practices, there should be additional analysis of how varying levels of conservation or best practices would help agencies achieve the standards. Estimated indoor water use across Metropolitan's service area has declined since 2000 to approximately 53 gallons per capita per day (GPCD) in 2017. Future indoor per capita use is projected around 52 GPCD even after accounting for passive and price-based conservation savings. Achieving compliance with indoor water use targets of less than 50 GPCD with passive conservation alone would not be a reasonable expectation.

As stated in the Report, recent rebate activity throughout Metropolitan's service area has declined since the last drought ended in 2017. However, the Los Angeles Department of Water and Power (LADWP) remains a compelling anomaly to this trend. Since 2016, for example, LADWP maintained significantly higher per capita rebate participation for residential indoor devices (high-efficiency toilets and high-efficiency clothes washers) than the rest of our service area This is likely because LADWP substantially supplements the baseline Metropolitan incentive for high-efficiency toilets ($100 vs. $40 per toilet) and high-efficiency clothes washers ($400 vs. $85 per washer). A higher rebate offering provides a more affordable retrofit, nudging more customers to upgrade their old devices. This analysis suggests that, should the indoor standards be further reduced, water suppliers may need higher incentive levels than initially estimated. This high cost for active conservation may be unfeasible for many agencies due to budget constraints and the impacts of falling revenue due to drought and the recent pandemic.

(2) That "Suppliers have time to plan, develop partnerships and programs, and support conservation as a way of life to meet compliance standards (Page 81, Section 8.1)."

Water suppliers are extremely limited on time and resources to meet the 2025 compliance standard. Once the standards are finalized, suppliers may only have three years to organize efforts for compliance. Suppliers will require time to develop new programs, which can take at least a year (and only then if those efforts were already budgeted). If additional time to attain budget approval is necessary, there would need to be at least two years for program development. Program uptake and marketing would require approximately another six months before indoor residential water use would begin to drop in small increments. Therefore, it may take years before widespread implementation of active conservation has significant effects on reducing indoor water use.

Assessment of potential impacts of the proposed revised standard

The Report identifies numerous potential impacts that may occur by revising the residential indoor standards. However, DWR, SWRCB, and water suppliers must have the opportunity to quantify the impacts. A quantitative analysis would allow the state and stakeholders to identify mitigation efforts to reduce the significance of potential adverse effects. Before DWR and SWRCB submit their final recommendations to the Legislature, we request that a more quantitative examination of the following be conducted:

- Impacts on water and wastewater operations
- Cost impacts of developing and enacting higher rates of conservation programming
- Economic effects on water affordability and disadvantaged communities
- Results of a potential shift in water use from commercial to residential as long-term work patterns change following the COVID-19 pandemic

Lasting impacts from the pandemic may be significant and must be considered as an important factor in setting of a new standard. Water use patterns will shift between the commercial and residential sectors because of a likely shift to a hybrid work-from-home model becoming the new normal. As stated in the Draft Report, "This increase in indoor residential water use due to COVID-19 is important and could affect a supplier's ability to meet their water use objective even if their overall water use declines (page 77)." This is a potentially significant outcome, and it will be a few years before there is enough information available to understand the actual impacts on residential water use. Without an attempt to account for the implications on residential water use due to COVID-19 (such as a quantitative sensitivity analysis), the targets are challenging to support.

Throughout this process, DWR and the SWRCB have led the development of the indoor standards. Still, they have fallen short in meeting the statutory requirements to collaborate with stakeholders due to the extraordinary circumstances of the last year. The recommended standards have the potential for long-term adverse impacts on water agencies. Therefore, while Metropolitan supports the efforts behind the Draft Report, we strongly recommend that DWR and the SWRCB revisit these areas of serious concern and reengage in a more collaborative stakeholder process before final recommendations on the indoor residential standards are made to the Legislature.

Once again, Metropolitan appreciates your consideration of these comments and remains dedicated to collaborating with our member agencies, DWR, and the SWRCB to successfully implement the *Making Water Conservation a California Way of Life* legislation.

Very truly yours,

Brad Coffey
Manager, Water Resources Management

MWDOC

Street Address:
18700 Ward Street
Fountain Valley, California 92708

Mailing Address:
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St, Sacramento, CA 95814

Re: Indoor Residential Water Use Study

Dear Water Use Efficiency Branch,

The Municipal Water District of Orange County (MWDOC) appreciates the opportunity to provide comments to the California Department of Water Resources (DWR) on the *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study* (Study). MWDOC provides imported water services to 3.2 million residents through 28 retail water suppliers throughout Orange County. MWDOC also leads implementation of a broad variety of water use efficiency programs regionally on behalf of our water agencies. The Water Code recognizes that our members, local urban retail water suppliers, have the primary responsibility of meeting standard-based water use targets. However, because of our regional role as an imported water wholesaler and lead agency implementing water use efficiency programs, we are very concerned with the indoor standard as proposed.

Early Adopters Get Penalized

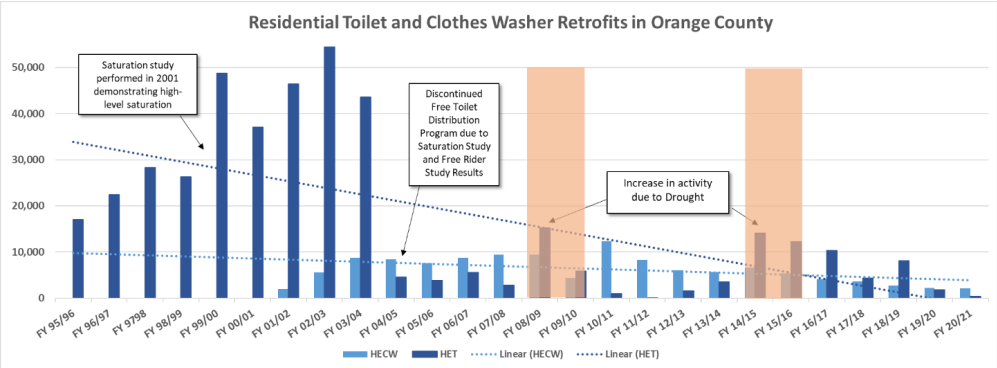
In 1991, MWDOC was a founding signatory to the California Urban Water Conservation Council and began voluntarily implementing Best Management Practices. These efforts focused heavily on indoor residential plumbing devices such as toilets, showerheads, and clothes washers because they were cost effective. More than 447,500 water-wasting toilets and 123,000 clothes washers have been replaced through these programs.

To measure our success, in 2002, MWDOC conducted an Orange County Plumbing Fixture Saturation Study (Saturation Study). Data used in this Saturation Study was collected in 2000 from 800 randomly selected single- and multi-family homes. The Saturation Study focused only on homes built prior to 1992 with 3.5 gallon per flush (gpf) or greater toilets (the plumbing code began requiring 1.6 gpf toilets and 2.5 gallon per minute showerheads in 1993). The Saturation Study found that 48.6% of all single-family and 37.6% of all multi-family toilets were already water conserving (1.6 gpf or less). The Saturation Study also found that that 67% of pre-1992 single-family households and between 53% and 66% of multi-family households had water-conserving showerheads. These efficiency gains were achieved just eight years after the 1992 plumbing code changes.

This Saturation Study demonstrates that Orange County is very highly saturated with water conserving plumbing fixtures in residential properties through the millions of dollars of investments to achieve these early efficiency gains by replacing 3.5 gpf or greater toilets. **With the very high levels of water efficient plumbing fixture saturation from 30 years of program implementation, the cost to achieve additional savings by replacing existing 1.6 gpf toilets with 1.28 or 0.8 gpf toilets would not be cost effective. The costs to achieve the standards must be considered when setting all water efficiency standards.**

If You Build It, They May Not Come

As mentioned above, today MWDOC continues to offer incentives for replacing older residential toilets and clothes washers. However, participation rates have dwindled over the years as shown in the graphic below. We have marketed these programs to residential consumers on a quarterly basis, and have for many years, using our most effective marketing tool - water bill inserts. Drought periods result in an increase in participation, as shown in 2009 and 2015. This reduction in participation signals that the potential for additional savings, due to our more than 30 years of active program implementation, is greatly diminished. Of greatest concern to us is our consumers' interest and ability to further increase efficiency inside their homes. **We cannot require customers to participate.**



Our Pandemic Data Does Not Match, Not Even Close

MWDOC recently completed a Residential Water Use Study utilizing more than 375 Flume Water Smart Home Monitors placed on single family residential water meters throughout the county. This study found single-family residential water use to be between 55 and 58 gpcd prior to the pandemic (Q4 of 2019 and Q1 of 2020). During the pandemic, indoor residential water use peaked at nearly 74 gpcd in April 2020. The average monthly indoor use from April – September 2020 was nearly 76 gpcd; **a 19.5 gpcd increase due to the pandemic** (76 gpcd during the pandemic - 56.5 gpcd pre pandemic = 19.5 gpcd). The Water Use Study also found that <u>not one</u> participant's water use dropped below an average of 48 gpcd for any week during 2020. Based on our analysis, the pandemic has caused a significantly greater increase to indoor residential water use than the State's estimate of 3 – 5 gpcd simply because more residents are working and students attending school from home.

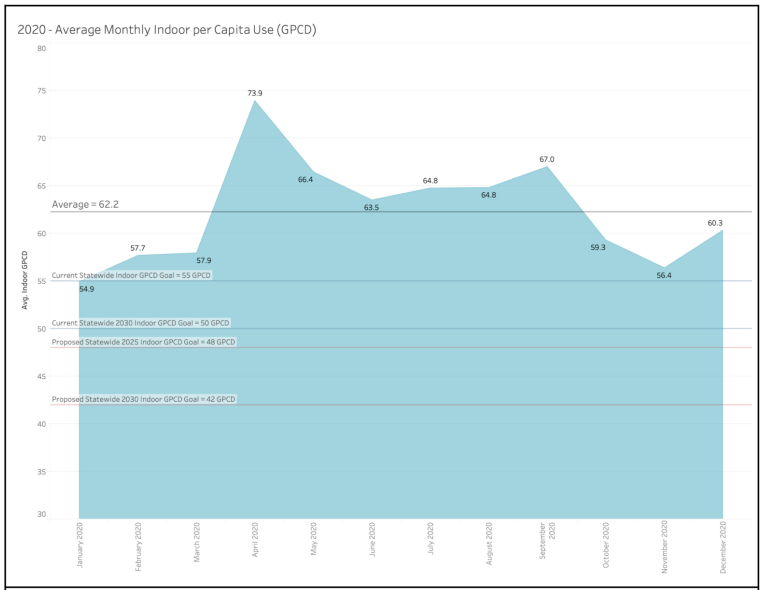


Figure 9: *Average indoor daily per capita use, per month, Orange County Flume Users, 2020*

The pandemic will likely result in fundamental and long-term changes in residential water use. Businesses and governmental agencies have recognized that employees can work from home and maintain or even increase productivity. As a result, employers will be allowing workers to work from home, which will increase residential water use. **Because of this, we firmly believe that it is too soon to set a new indoor use standard when this situation is still fluid.**

Supply Reliability Conflicts and Stranded Assets

Orange County has been making significant water supply reliability investments in water recycling since the early 1960s. While strategies differ in north and south Orange County, the result is the same: water is recycled to increase local water supply reliability and reduce imported water use to sustain the local economy. The differences are described below:

In northern Orange County, in the early days (1975), Water Factory 21 utilized recycled water as a salt-water intrusion barrier to protect the groundwater basin. More recently (2008), the Ground Water Replenishment System (GWRS) not only provides the same salt-water intrusion benefits, but also replenishes 100,000 acre feet per year (Phases I & II) into the basin. GWRS is the first Indirect Potable Reuse Project (IPR) in the country and allows for a well-managed basin that enables agencies overlying the basin to sustainably pump 77% of their demands. Unlike purple pipe recycling used primarily for irrigation, Orange County's GWRS, results in the reuse of wastewater infinite times; all water entering the wastewater system (indoor use) is recycled over and over.

Phase III of GWRS is currently under construction and is anticipated to begin production in 2023. Phase III will allow for recycling of 100% of the recyclable wastewater in north Orange County. We acknowledge and appreciate the inclusion of the Bonus Incentive in the Standards Framework: north Orange County agencies will benefit from both their reliability investments and the framework Bonus Incentive. However, the consequences of the proposed indoor standards create reduced wastewater availability over time, which will result in Phase III becoming a stranded treatment plant asset, resulting in less water to replenish the basin and the need for more imported water.

South Orange County is nearly 100% dependent on imported supplies for potable water. Because of this, water agencies have been using recycled water primarily for landscape irrigation – a sound investment that agencies began making over fifty years ago. Recycled water treatment plants and distribution systems continue to be built as communities grow. Approximately, 46% of all wastewater is currently being recycled in south OC, yet the Bonus Incentive does not apply to purple-pipe recycling. There is great regional interest to recycle 100% by expanding purple pipe systems and possibly building potable reuse. There are challenges including storage and limited potential for IPR (agencies have to supplement recycled water with potable water in the summer due to peak irrigation demand) that need to be overcome, but are actively being explored in the region.

For both north and south Orange County, the proposed indoor standards will reduce wastewater flows available for recycling, which conflicts not only with the State's long-term goals for water recycling, but also with local water supply reliability planning and investments. Conflicting State goals for water efficiency and recycling must be resolved**. Greater allowances for recycling, both purple-pipe and potable reuse, need to be a part of any changes to the standards, especially for agencies with the potential for stranded treatment and distribution assets.**

Qualitative Analysis was Enlightening, Quantitative Analysis is a Must

Draft Appendix I Potential Benefits and Impacts of Changing Ri-gpcd of the Study provides a qualitative analysis of the benefits and impacts of changing Ri-gpcd on water and wastewater utilities. This report acknowledges that the "study could be enriched through the collection of more quantifiable data." We strongly recommend that the state agencies now shift their focus to a quantitative analysis to better understand all the benefits and impacts of changing Ri-gpcd. A quantitative analysis should be completed before reducing the Ri-gpcd in 2025. Changing the current indoor standard without this analysis renders the findings incomplete.

MWDOC highly encourages the inclusion of a quantitative analysis of the benefits and impacts to determine how changing standard for indoor residential water use will affect water and wastewater management before lowering the standard below 55 gpcd. Quantitative analysis should be consistent with California Water Code Section 10609.4. The ultimate indoor residential goal, whatever it may be, does not need to be accomplished by 2030.

Once again, MWDOC appreciates the opportunity to provide these comments. Should you need any clarification regarding these comments and recommendations, please contact Joe Berg on my staff at (714) 593-5008 or jberg@mwdoc.com.

Sincerely,

Robert J. Hunter
General Manager

June 4, 2021

Submitted via: WUE @water.ca.gov

Water Use & Efficiency Branch
Department of Water Resources
901 P Street Sacramento, CA 95814`

Re: Comments on the Draft Indoor Residential Water Use Study

Dear Water Use Efficiency Team,

Thank you for the opportunity to provide comments on the indoor residential water use standards report. We appreciate the intensive work of Department of Water Resources (DWR) and State Water Resources Control Board (State Water Board) staff and consultants to develop this report. We are writing to support the draft joint recommendations to update the indoor residential water use standard presented in the "Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study" from May 2021.

RECOMMENDED INDOOR STANDARD

In AB 1668 and SB 606, the state of California made a commitment to use science to set water efficiency standards for urban water suppliers.

In 2018, when the bills were passed, limited data were available on indoor water use, and 55 gallons per capita per day (gpcd) was selected as a placeholder starting value because it was already in statute from 2009 legislation, SBx7-7. We now know that 55 gpcd is higher than current median indoor residential water use.

Using four detailed analytical approaches, DWR and State Water Board found that the current statewide average residential indoor water use in California is within the range of 49 to 52 gpcd. We know that even these numbers may be conservative as methods could not fully exclude outdoor water use.

DWR also confirmed that indoor residential water use has been declining for decades and this decrease is due to the replacement of old appliances and fixtures with more efficient models. Several studies, including recent Pacific Institute analyses, estimate indoor water usage for homes meeting California's current building codes and standards to be about 35 gpcd. New, more efficient, devices are on the market that use even less water than current standards, as are devices that help customers to quickly identify leaks inside their homes. This suggests that indoor use could decline even further.

DWR correctly eliminated "active" conservation from its assessment of future changes in indoor water use, addressing the "natural" declines that will occur as a result of new construction and non-incentivized replacement of inefficient fixtures (this is referred to as passive savings). Passive conservation from existing standards and codes is projected to reduce indoor residential water use by about 4 gpcd by 2030 without any active conservation efforts due to existing standards and codes for appliances and fixtures.

It is reasonable to set a standard near the median and adjust for natural declines in indoor water use. Therefore, we support the draft Indoor Residential Water Use Study recommendation for an indoor efficiency standard of 55 gpcd until January 1, 2025, 47 gpcd from January 1, 2025 until January 1, 2030, and 42 gpcd beginning January 1, 2030.

The study concluded that average indoor water use in California for 2017 through 2019 was already well below the 55 gpcd standard. DWR also estimates that 39% of urban water suppliers are on track to be at or below 42 gpcd by 2030 with passive conservation alone. Further evidence of the reasonableness of the draft recommendations is that several water agencies are already performing better than the proposed 2025 and 2030 indoor standards.

AFFORDABILITY AND IMPACTS ON DISADVANTAGED COMMUNITIES

Consistent with the State's commitment to the Human Right to Water Policy, DWR evaluated whether the recommended indoor efficiency standard would impact low income communities. The draft report found that low income households use less water than higher income households and concluded that the recommended standard would not disproportionately impact suppliers with higher poverty rates.

However, the draft report concludes the effect of the recommended efficiency standard on affordability of water and the Human Right to Water is unknown based on a one paragraph discussion. The qualitative assessment should be expanded to recognize that low income households have the greatest need to ensure that they are not paying for water waste. This is particularly important for disadvantaged households that have struggled to pay bills and now face COVID-related debt. The report implies that suppliers are the only ones who are adversely impacted by this financial problem.

The report's discussion should also recognize the challenges low-income communities face in accessing supplier's conservation rebate programs, not just the cost to suppliers of providing these incentives. Many low income and disadvantaged communities live in older, pre-2000 constructed homes which still have inefficient fixtures and leaks. A 2017 study by the Alliance for Water Efficiency estimates that 20% of California's toilets are still inefficient. The DWR report should recognize the significant combined efficiency and affordability benefits that could be achieved through targeted fixture replacements in low-income neighborhoods.

WATER EFFICIENCY BENEFITS AND IMPACTS

The preliminary findings report provides a qualitative assessment of the water efficiency impacts to water supply, wastewater, and recycled water. DWR's recommended efficiency standards are based on the natural decline in residential indoor water use that will occur without any active conservation efforts. The report also correctly identifies that any agency-specific impacts will vary with local conditions as will potential mitigations. A more detailed impact assessment will be part of the State Water Board's adoption of the final regulation.

The report identifies benefits and adverse impacts to water and wastewater utilities and characteristics that can contribute to adverse impacts based on a report provided by the California Urban Water Agencies (CUWA). To the extent that concerns are now being raised by some water agencies that there has not been sufficient discussion about these impacts, we simply point out that water utilities have had far more opportunity for input at this point than members of the public. We appreciate the opportunity to make our comments here.

The qualitative benefits discussed in the DWR report focus around system-wide benefits such as cost savings and deferred infrastructure investments. The adverse impacts are discussed in depth, ranging from water quality impacts to reduced revenue.

DWR's draft report implies that lowering the indoor water efficiency standard will drive additional agency actions to reduce indoor water use and result in adverse impacts to water systems. However, **building codes and Title 20 appliance and fixture standards have been and will continue to be the primary driver for these reductions**. According to a report from the Alliance for Water Efficiency, approximately 4 million toilets were replaced in residential households due to incentives, and 11 million through natural replacement between 1990 and 2015 in California. The proposed reductions in the indoor standard over time is based on passive savings from these appliances and fixtures and are merely keeping pace with the decline already occurring.

Moreover, **water suppliers have flexibility in how they meet their water use objectives.** AB1668 and SB606 set forth indoor, outdoor, and water loss standards that are then used to calculate a customized water use objective for each water supplier. While water suppliers are required to meet their water use objective, they are not required to meet the individual efficiency standards. This flexibility allows water suppliers to use resources and programs best suited to their service area and future needs. Furthermore, the legislation allows for variances and a recycled water bonus which may also be used, as applicable, for further flexibility.

Additionally, the draft report **misses a wide range of co-benefits associated with indoor water efficiency improvements for water, wastewater, and recycled water systems as well as the broader community and ecosystems.** Additional benefits for water, wastewater, and recycled water systems include:

- Improving water supply reliability
- Increasing carry-over storage in surface and groundwater supplies
- Improving the reputation of the utility, as it is seen as a leader
- Eliminating capital investment in water and wastewater systems (the draft report only refers to deferred capital investment)
- Reducing energy usage for water systems (the draft report only refers to energy reductions from wastewater utilities)
- Reducing GHG emissions associated with reductions in energy usage
- Maintaining water affordability (by deferring or eliminating capital investment)
- Avoiding sewer overflows for systems at or near capacity

Another issue is that the draft report narrowly focuses on impacts to water, wastewater, and recycled water systems. However, AB 1668 states that "the studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies." **By taking such a narrow scope, the report ignores benefits to customers and to ecosystems**.

Finally, we think it is important that the DWR report address the potential for minimizing adverse impacts by **more accurately accounting for efficiency improvements in medium- and long-range planning**. A recent Pacific Institute analysis demonstrates that urban water suppliers routinely overestimate future demand due largely to inflated estimates of per capita water demand and, to a lesser extent, overestimates

of population growth. Improved forecasting could help utilities avoid stranded assets and effects on existing and planned investments for recycled water.

In summary, we support the efficiency standard recommendations as being based in the best available science and data, reasonable, and feasible. The updated indoor residential water use standards are an essential step to making conservation a California way of life. Anything less than these standards would promote inefficient water use.

Martha Davis	Heather Cooley	Tracy Quinn
Mono Lake Committee	Pacific Institute	Natural Resources Defense Council

OLIVENHAIN
Municipal Water District

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th Street
Sacramento, CA 95814

RE: Proposed Indoor Residential Water Use Standards

Dear Water Use Efficiency Branch,

On behalf of Olivenhain Municipal Water District, I am writing to provide comments on the California Department of Water Resources' recently released *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study* and the corresponding proposed indoor residential water use standards. OMWD provides 87,000 customers in northern San Diego County with water, wastewater, recycled water, hydroelectric, and recreational services.

OMWD is a strong proponent of water conservation, evident through its numerous programs and policies. For example, OMWD has hosted conservation workshops, established a water waste hotline, publicized rebate opportunities on water-saving devices, encouraged landscape transformation, coordinated free water use evaluations to help customers conserve, and educated the next generation about water conservation through student contests and educational programs.

In addition to these measures of conserving potable water, OMWD is also a regional leader in expanding the availability of recycled water. OMWD is a member of the North San Diego Water Reuse Coalition, which is advancing throughout the region the use of recycled water—a reliable, drought-proof source of water that will further conserve potable water.

These conservation efforts have paid off, and OMWD customers continue to use significantly less water than prior to the last drought, even without any mandatory water use restrictions in place. OMWD has far exceeded its SB X7-7 conservation target of reducing gallons per capita per day from a baseline of 352 GPCD down to 282 GPCD in 2020. In 2020, actual GPCD was a staggering 41 percent lower than the baseline at only 206 GPCD.

It is clear that OMWD recognizes the importance of using water efficiently. However, we have several concerns regarding the standards that are being proposed as a result of the Study.

conditions. After much negotiation, discussion, and public input, the law established a standard of 55 GPCD for indoor residential water use, decreasing by 2.5 gallons in 2025 and down to 50 GPCD in 2030. The revised standard proposes to radically decrease those previously negotiated standards to unfeasible amounts: 50 GPCD beginning in 2020, lowering to 47 GPCD in 2025, and 42 GPCD in 2030.
The proposed standards are unmanageable for many water suppliers; have not been developed using a collaborative process with stakeholders as AB 1668 requires; and do not properly consider negative impacts to potable water systems, wastewater collection and treatment systems, or recycled water treatment.

The following list of concerns with the proposed indoor residential use standards should be considered by DWR and the State Water Resources Control Board:

Punishing Disadvantaged Communities
By forcing Californians to an arbitrary 42 GPCD, disadvantaged communities will be further punished for not being able to afford new fixtures that use water more efficiently. These standards are not equitable, requiring more from those who have less. While rebates are sometimes available to residents, these rebates usually only cover a portion of an appliance's cost. Furthermore, applying for rebates typically requires internet access and other resources that not everyone has access to. Implementing additional rebates or direct-install programs costs more money for water suppliers who are already struggling due to revenue decreases in the wake of the COVID-19 pandemic, and could result in additional rate increases, reducing the affordability of drinking water.

Lack of Collaboration with Water, Wastewater, and Recycled Water Agencies
DWR's current efforts would not meet the legislative requirements to collaborate with, and include input from, water and wastewater agencies. AB 1668 requires:

> *The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.*[1]

We appreciate that DWR held a day-long workshop on May 21 in response to concerns raised regarding collaboration with stakeholders. However, we feel that the cart is before the horse– with numbers being presented before collaboration occurred. Stakeholders did not have an opportunity to provide input to inform the draft standard prior to its release. Additionally, it is our understanding that water use studies participants have had mixed results when trying to provide clarifications or update the data ultimately used for the draft standard.

Consequences on Infrastructure

---

[1] *Water Code Section 10609.4 (b)(2)*

Should the bill be successful in lowering indoor residential water use standards to 42 GPCD, there will likely be negative consequences on potable water systems, wastewater collection and treatment, and recycled water treatment and quality. Water and wastewater systems are designed to operate with a certain level of water flow. Thus, reduced water flow can lead to dangerous water quality issues such as nitrification and degradation of chlorine residuals. AB 1668 requires:

> *The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.*[2]

However, only a brief quantitative analyses was conducted in the study, which stated that these systems *could* experience negative impacts as a result of decreasing GPCD requirements, but not to what extent, or at what level of conservation those impacts might be seen. Instead, stakeholders were told at a April 22 DWR workshop that any of the potential impacts that might be experienced as a result of these decreased standards could simply be resolved with more time and money—something that water suppliers across the state do not have enough of as it is, nor do their overburdened ratepayers that will ultimately shoulder the cost.

Reducing water consumption beyond a certain point could become counterintuitive, seeing how the primary treatment for water quality and infrastructure issues as a result of reduced flows are in fact flushing, or wasting, potable water through lines. Similarly, increased salinity that could present in recycled water as a result of more concentrated flows is typically mitigated in landscapes by leaching, or applying more water than would otherwise be considered efficient. A complete understanding of the effects of a significantly reduced standard such as what has been presented is essential to prevent potentially detrimental unintended consequences.

Weakening Drought Resilient Water Supplies

In a time when local, state, and federal entities and leaders are pushing to expand the use of recycled water, the proposed standard will negatively impact recycled water supplies. The less water that is available for reclamation, the more potable water may be needed for nonpotable uses, nullifying the water conservation objective that the bill attempts to accomplish. The Governor's Water Resilience Portfolio recognizes recycled water as a sustainable, nearly drought-proof water supply that can nearly triple in the next ten years under current conditions. But if investments in water recycling become stranded assets, water suppliers will be exceedingly less likely to invest their limited resources into expanding this sustainable form of local water supply that conserves potable water.

Impractical "One-Size Fits All" Policy

---

[2] *Water Code Section 10609.4 (b)(1)*

The proposed standard for indoor residential water use is based on a single methodology that does not consider essential factors such as local and regional water conditions or hydrologic conditions. To apply a singular methodology to a state as large and diverse as California illustrates the inherent flaws of the proposed targets.

We appreciate your consideration of our concerns. If you or your staff should need any additional information, please do not hesitate to contact me at 760-753-6466 or kthorner@olivenhain.com.

Regards,

Kimberly A. Thorner
General Manager

OC SAN
ORANGE COUNTY SANITATION DISTRICT
10844 Ellis Avenue
Fountain Valley, CA 92708
714.962.2411
www.ocsan.gov

June 2, 2021

Karla Nemeth
Director
California Department of Water Resources
1416 9th Street,
Sacramento, CA 95814

Re: DWR Indoor Water Use Standards

Dear Ms. Nemeth:

The Orange County Sanitation District (OC San) provides wastewater collection, treatment, and recycling for approximately 2.6 million people in central and northwest Orange County. OC San's primary mission is to protect public health and the environment through its services. As such, we would like to comment on the joint Department Water Resources and Water Board proposed recommendations for indoor water use standards as they relate to previously established standards set forth in AB 1668 (Friedman, 2018).

Throughout the years, Californians have increasingly become water efficient continuing to conserve more and more water. The proposed standard of 47 GPCD in 2025 and 42 GPCD in 2030 can have unforeseen circumstances for Wastewater Agencies such as OC San.

As well intended as the proposed standards are, reduced wastewater flows could limit the ability to self-clean and flush the collection system line, which will increase stagnation of wastewater in the pipeline, blockages, increase corrosion and odors and will result in a higher wastewater strength which can have unintended consequences and impact the treatment facilities. This could increase how often we clean and require us to add more chemicals to address odor concerns, both of which would increase costs to the ratepayers. Our facilities are sized to handle peak wet weather flow events, not GPCD (which is dry weather flows). Through our robust CIP, we plan to invest nearly $3 billion over the next 10 years to maintain and upgrade our infrastructure at both our Plants in Huntington Beach and Fountain Valley and our collections system throughout our service area in Orange County, California.

Wastewater treatment is a biological process with demand for oxygenation, and physical processes with chemical usage related to solids concentration of the wastewater. While average wastewater flows may decrease, our facilities are sized to handle peak wet weather flow events. Operating and maintaining facilities that are sized to handle these infrequent events as well as decreasing average wastewater flows is a great challenge to OC San and other wastewater agencies. Most equipment cannot handle such wide range of flows efficiently.

ORANGE COUNTY SANITATION DISTRICT

Furthermore, some equipment and process tanks are left unused during normal dry weather flows which could lead to their inability to perform when needed during wet weather flow events.

OC San has worked in partnership with the Orange County Water District (OCWD) to fund and operate the Groundwater Replenishment System (GWRS), which works to purify and reuse approximately 70 percent of the wastewater being received by OC San currently. When the Final Expansion of the GWRS is completed in 2023, 100 percent of the wastewater received by OC San that is reclaimable will be recycled by the GWRS. That water is then pumped back into the groundwater basin to be re-used as indirect potable drinking water. In order for the GWRS to operate at full capacity, OC San needs to continue to see existing levels of flow from wastewater sources. Reducing the water consumption of this region could have contrary effects to the efforts of the GWRS and could leave unused capacity in treatment and storage facilities. The proposed standards do not address organizations such as OC San and OCWD that have the foresight of creating a reliable and sustainable water source for their service areas by recycling wastewater from various sources including indoor water use for drinking water.

For these reasons, the Orange County Sanitation District respectfully opposes the proposed changes to the indoor water use standards. Please do not hesitate to contact Jennifer Cabral, OC San's Administration Manager at (714) 593-7581 or via email at jcabral@ocsan.gov should you have any questions.

Sincerely,

David John Shawver

David John Shawver
Board Chairman

ORANGE COUNTY WATER DISTRICT
ORANGE COUNTY'S GROUNDWATER AUTHORITY

May 20, 2021

Sent via email: WUEStandards@water.ca.gov

Water Use Efficiency Branch
Department of Water Resources, P.O. Box 942836
1416 9th Street
Sacramento, CA 95814

RE: Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study – Comment Letter

Dear Water Use Efficiency Branch,

Thank you for the opportunity to comment on the California Department of Water Resources (DWR) *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study (Study)*. Orange County Water District (OCWD) manages the local groundwater basin in Orange County, California. OCWD serves 2.5 million residents residing in 13 cities, five retail water districts, and one investor-owned water utility. These nineteen agencies include the cities of Anaheim, Buena Park, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, La Palma, Newport Beach, Orange, Santa Ana, Seal Beach, Tustin, and Westminster along with the East Orange County Water District, Irvine Ranch Water District, Mesa Water District, Serrano Water District, Yorba Linda Water District, and the Golden State Water Company.

The OCWD Board of Directors has taken a unanimous position in opposition to the findings in the Study based upon the rationale enumerated in this letter. DWR should focus on creating additional water supply versus arbitrarily and unnecessarily cutting the human right to water in our homes.

In the Study, DWR proposes to reduce the indoor residential water use standards from the current levels that were established in 2018 through negotiated policy bills that were enacted by the California Legislature, Assembly Bill 1668 (Friedman D-Glendale) and Senate Bill 606 (Hertzberg D-Van Nuys). More specifically, the DWR Study proposes to reduce the indoor residential water use standards from 52.5 gallons per capita per day (GPCD) in 2025 to 47 GPCD; and further reduces the standards in 2030 from 50 GPCD to 42 GPCD.

PO Box 8300
Fountain Valley, CA 92728-8300

18700 Ward Street
Fountain Valley, CA 92708

(714) 378-3200
(714) 378-3373 fax

www.ocwd.com

OCWD has four primary comments on the Study:

1. There is no analysis nor sufficient time to consider the possible impact to local reuse projects;
2. DWR has not honored their agreement to follow the statutory collaborative process in AB 1668 (Friedman D-Glendale) in preparing the Study;
3. There is no analysis nor sufficient time to consider the possible impact to local wastewater system infrastructure; and
4. DWR should focus on creating additional water supplies versus arbitrarily and unnecessarily cutting human water consumption in the home.

As background, OCWD is the home to the Groundwater Replenishment System (GWRS), the world's largest potable reuse facility, which creates a new local supply of water that we use to replenish the groundwater basin. The basin, a regional asset, provides 77% of the drinking water for north and central Orange County. OCWD, along with our project partner, the Orange County Sanitation District (OC San), is constructing the final expansion of the GWRS to increase production from 100 million gallons of water per day (mgd) to 130 mgd— enough water for 1 million people. Local rate payers will have invested $920 million once the GWRS final expansion project is complete.

The new standards DWR has promulgated could result in insufficient flows being available to the GWRS that would prevent the treatment of 130 mgd of wastewater and result in a reduction in available local water supply. A significant amount of reuse infrastructure could become stranded resulting in the wasting of large amounts of rate payer money. OCWD could now be penalized for proactively working to reuse local wastewater. The estimated potential impact to the GWRS and other reuse projects throughout the state should be analyzed and provided in the DWR report.

OCWD would also like to point out that DWR's current efforts do not meet the intended legislative requirements to collaborate with, and include input from, water and wastewater agencies. AB 1668 (Friedman D-Glendale) requires:

> "The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies."

Input from water, wastewater, and recycled water agencies before the recommendation for indoor residential water standards was made by DWR was missing. Essentially DWR staff has made an analysis on its own and is now in the process of defending its work. This is not what AB 1668 intended.

OCWD's third comment is regarding the potential impact to local wastewater collection systems. Reduced wastewater flows could limit the ability of flows to naturally flush the OC San collection system line which would increase stagnation of wastewater in the

pipeline, increase corrosion and odors and could result in a higher wastewater strength which can have unintended consequences and impact the treatment facilities, including the GWRS. The estimated potential impact to the OC San collection system and other wastewater systems throughout the state should be analyzed and provided in the DWR report.

We respectfully request the DWR delay sending the Study to the Legislature until the above-mentioned issues are addressed. Should you have any questions or comments, please contact OCWD General Manager Michael Markus at mmarkus@ocwd.com or (714) 378-3305.

Sincerely,

Stephen R. Sheldon
Board President

cc:
Senator Josh Newman, 29th District
Senator Bob Archuleta, 32nd District
Senator Tom Umberg, 34th District
Senator Patricia Bates, 36th District
Senator Dave Min, 37th District
Assemblymember Phillip Chen, 55th District
Assemblymember Sharon Quirk- Silva, 65th District
Assemblymember Steven S. Choi, Ph.D., 68th District
Assemblymember Tom Daly, 69th District
Assemblymember Janet Nguyen, 72nd District
Assemblymember Laurie Davies, 73rd District
Assemblymember Cottie Petrie-Norris, 74th District

Regional Water Authority
Building Alliances in Northern California

5620 Birdcage Street
Suite 180
Citrus Heights, CA 95610

Tel: (916) 967-7692
Fax: (916) 967-7322
www.rwah2o.org

June 4, 2021

WUEStandards@water.ca.gov

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St, Sacramento, CA 95814

Re: Indoor Residential Water Use Study (IRWUS) REPORT COMMENT LETTER

Dear Water Use Efficiency Branch,

Summary

The Regional Water Authority (RWA) urges the Department to conduct a more thorough evaluation of the impacts the proposed recommended standards in the IRWUS draft report regarding the ability for water suppliers to achieve the human right to water. It is our belief that the achievement of the human right to water is the essential function for which water agencies were originally established. We further believe that statewide policies put forth should advance the ability to achieve the human right to water and to do so must put climate resilience first. We are concerned that the proposed recommended standards would result in the diversion of investments from the best climate resilience and the lowest cost option to improve water reliability in the Sacramento Region, thereby increasing costs and exacerbating the challenges to the continued achievement of the human right to water.

- Regional conjunctive use is the least cost water reliability alternative in our region. A new acre-foot of water from conjunctive use in the region costs approximately $250. Additionally, conjunctive use improves water management in all year types, both wet and dry, and as a result holds great ability to adapt to the longer dryer warmer droughts and shorter less frequent but more intense storm events we know are intensifying with climate change and it does this while improving environmental conditions.

- We are committed to water use efficiency. It is necessary for climate adaption, but the costs of gaining a new acre-foot of savings from indoor water use efficiency are rising and the next increment of indoor water use efficiency measures will cost approximately $400 per acre foot or more. Our twenty-year experience in advancing water use efficiency has shown us that much of the lowest cost savings measures from indoor water use efficiency have already been implemented. This is captured by the fact that we have experienced a 57 percent decrease in indoor rebate applications over the last 10 years despite more funding being available.

Dear Water Use Efficiency Branch

- Eighty-Five percent of the cost of water delivery is borne by local rate payers. A policy that "accelerate(s) water conservation will cost money[1]" will likely exacerbate this cost share. Unfortunately, this poses a significant challenge to affordability in the human right to water.

The draft report states that regulations have the potential to conflict[2]. The draft report further states that recommendations in the draft report will cost money and those potential economic impacts were not analyzed[3]. The totality of these three statements leaves us extremely concerned that the recommendations in the draft report will make it harder to adapt to the impacts of climate change and hinder the continued and expanded achievement of the human right to water in the region.

Specific tradeoffs in the Sacramento Region

California water delivery has been described as a "system of systems." This basic fact poses a significant challenge to any effort that seeks to establish a single indoor water use efficiency standard statewide. It poses a particular challenge when trying to find the lowest cost path and promoting the achievement of the human right to water at the community level.

The draft report states:

"water use efficiency is often less expensive than developing new water supplies and may help to ensure equitable and affordable access to water.[4]"

Unfortunately, this statement is not supported by the experience in the Sacramento Region.

RWA has a twenty-year history of implementing and promoting water use efficiency. We are unequivocally committed to advancing water use efficiency. It is a core element of the Water Forum agreement, a local agreement between a diverse group of business and agricultural leaders, citizen groups, environmentalists, water managers and local

[1] Draft IRWUS report section 7.4 Unknown effect on affordability of water and Human Right to water, Page 78
[2] "Often, these regulations are developed in parallel with each other with separately defined goals, and **they have the potential to conflict** " Appendix I 1.3.2 Interconnections with Other Regulatory Actions, page I-ES-6
[3] "The studies did not analyze potential economic impacts." Draft IRWUS report section 7.4 Unknown effect on affordability of water and Human Right to water, Page 78
[4] Draft IRWUS report section 7.4 Unknown effect on affordability of water and Human Right to water, Page 78

governments. The Water Forum is based on achieving the two co-equal objectives of water supply and environmental health.

RWA has extensive real-world, nationally recognized experience with implementation of water use efficiency in our community. We understand the challenges that we face for continued improvements in our community. We know that the lowest cost water efficiency measures have largely been implemented in the region. This is exemplified by the fact that we have experienced a 57 percent decrease in indoor rebate applications over the last 10 years, despite the availability of more funding.

Our experience tells us that much of the future work on indoor water use efficiency will require direct installation of efficient appliances and fixtures. The costs of direct installation programs are 3-5 times higher than prior indoor efficiency measures, like rebates, for the same level of savings. We expect that the next increment of indoor water use efficiency measures in the region needed to meet the recommended indoor standard will cost approximately $400 an acre-foot.

As the integrated region water management planning entity in the region, RWA has identified a regional conjunctive use program as necessary to adapt to climate change and maintain reliability. The next increment of implementing conjunctive use in the region will cost approximately $250 an acre-foot. Conjunctive use will allow for improved environmental management. Additionally, implementation of conjunctive use does not face the same adverse impacts identified in the draft IRWUS report.

Lastly, the vast majority of the costs for water delivery are borne at the local level. When the draft report states that implementation of the recommendations "will cost money," traditionally those costs are directly passed down to local rate payers. The report should identify how state funding will be made available to implement its recommendations to mitigate this concern. This is particularly important because increased costs that are passed down disproportionately impact the lowest income rate payers.

Conclusion

We believe that RWA and the state have a shared top-level priority to develop a 21st century water system that is resilient to climate change and meets both human and environmental needs consistent with the human right to water. We do not believe that the proposed recommendations in the draft IRWUS report are advancing that top-level priority in the Sacramento Region. We

further believe that statewide policy must advance the lowest cost greatest benefit approaches to adapt to climate change and advance the human right to water. This will require flexibility, collaboration, and reciprocal understanding. We stand ready to work with the state to develop a policy that comprehensively improves climate resilience and advances the human right to water.

Sincerely,

Jim Peifer
Executive Director

June 4, 2021

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St
Sacramento, CA 95814

Sent via email to: WUEStandards@water.ca.gov

RE: IRWUS REPORT COMMENT LETTER

Dear Water Use Efficiency Branch:

The San Diego County Water Authority (Water Authority) and its member agencies have long been leaders in advancing water use efficiency. We firmly believe that using water prudently and efficiently is a cornerstone of water supply reliability. Since 1990 – even with a regional population growth of 900,000 residents – the San Diego region has reduced per capita water use by 40 percent, sustaining the quality of life for 3.3 million residents and fueling a $245 billion regional economy. Since 1991, the Water Authority's water use efficiency programs and initiatives have conserved more than 1 million acre-feet of water. These savings have been achieved through a variety of measures that emphasize the value of water and promote a strong water use efficiency ethic. More than a million indoor water saving devices have been installed in the San Diego region including:

- Almost 625,000 ultra-low-flush and high-efficiency toilets
- More than 146,000 high-efficiency clothes washers
- More than 600,000 water-saving showerheads

Over time there has been less and less opportunity to save water through indoor programs, likely due to changes in plumbing code and market conditions. Based on our more than three decades of experience implementing water use efficiency programs, we are concerned with the recommendation to substantially reduce the residential indoor gallons per capita per day (gpcd) water use efficiency standard. An evaluation of the cost impacts and feasibility of lowering the standard is required prior to providing a recommendation.

The analysis included in the public Review Draft Report to the Legislature on the Results of the Indoor Residential Water Use Study was limited in the following areas:

No Evaluations of Best Practices

The Water Use Efficiency legislation adopted in 2018 included targets for indoor use. California Water Code 10609.4 (b) states:

The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately ***reflects best practices for indoor residential water use than the standard described in subdivision (a).***

The study results presented on April 22, 2021, focused on estimating current indoor water use. **There was no information about how best practices impacted indoor water use, what those best practices may be, or the feasibility of implementing those best practices in the time proposed to meet indoor water use efficiency targets.**

Many water suppliers have made significant investments in the installation of indoor water efficient devices and supported requirements to replace existing inefficient fixtures and limit the availability of new ones. Before recommending a significant change to the indoor standard, DWR should identify which best practices require implementation and the methodology and effort needed to meet the proposed targets.

Unintended Consequences

California Water Code 10609.4 (b) states:

The studies and investigations shall also include an analysis of the benefits and impacts of ***how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.***

The data presented to stakeholders on April 22, 2021, listed nine potential impacts to water and wastewater management. The impacts listed had unspecified increased costs associated with them. There was no analysis on how lowering the standard more or less would change costs and impacts. Working with stakeholders, DWR should quantify the financial and operational impacts to existing and proposed water, wastewater, and water reuse systems prior to finalizing the proposed standard.

Limited Stakeholder Engagement

California Water Code 10609.4 (b) states:

(2) The studies, investigations, and report described in paragraph (1) shall ***include collaboration with, and input from****, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.*

Stakeholder engagement with water agencies was limited for the most part to only three meetings prior to the release of the recommendation. Input on a recommended standard was not solicited until after April 22, 2021. The study on indoor water use was done with limited water supplier participation. Eighteen agencies shared data with the state but did not see the final report until April. Data was used from the electronic annual report for 157 agencies with no contact with the agencies to provide any context or assumptions about that data. From the fall of 2020 through the spring of 2021, water suppliers requested additional collaboration on the indoor study without a response from State agencies. Stakeholder meetings that were held were well attended attesting to water supplier's willingness to engage, however communication in these meeting was limited due to the nature of online engagement and the focus on informing stakeholders instead of offering a

forum for open dialogue. Efforts to improve stakeholder engagement that began in May of 2021 should continue as additional analysis is completed prior to making a final recommendation.

Assumptions on Passive Water Savings

Future reductions in indoor residential gpcd due to passive water savings was included as part of the indoor study. This analysis assumed new houses and changes in plumbing fixtures would result in lower indoor water use over time. What the study does not contemplate is the impact on individual water suppliers. Presumably, areas with older housing (and therefore higher indoor residential gpcd water use as indicated by the study) will have limited growth and therefore continue to have higher than average indoor gpcd use without significant investments. The long-term evaluation also does not account for future changes in working conditions as more individuals and businesses shift to telecommuting from home (agencies saw a 4.9 gpcd impact early in the pandemic) or for the reduction in efficiency that can be seen in devices like toilets as they age.

Financial Analysis

The study did not include an analysis of costs to meet the proposed standard. Water suppliers and their customers will be impacted by both the need to incentivize lower indoor water use, and the need to address impacts on water, wastewater, and water reuse systems. The current indoor standard for 2030 of 50 gpcd is estimated to save more than 150,000 acre-feet per year compared to current water use. Decreasing the standard would increase water savings but at an unspecified cost. Lowering indoor water use beyond the existing standard could have a significant impact on water affordability.

Other Limitations

Several other limitations of the indoor water use efficiency standard study were presented. They included:

Outdated population assumptions: 2020 U.S. Census data was not available for use in the report. Despite recommendations made by DWR staff in 2019 to extend the study period to include 2020 updates to population, the analysis was completed using Department of Finance or American Communities Survey data. Changes in population estimates could result in significant changes to indoor residential gpcd water use calculations. Compliance calculations for 2025 and 2030 will be based on the 2020 census and the report should be updated to include the 2020 census results prior to recommending lower standards.

Reliance on Electronic Annual Report (eAR) Data: The indoor water use study relied on data from the eAR for 157 suppliers. The eAR data may have errors resulting in errors in the overall analysis. Additional collaboration with water suppliers on data collection should be completed before changes to the standard are recommended.

Conclusion

The study completed by DWR and the State Water Resources Control Board (State Board) was limited. The study did not include the following components required by the legislation:

- *"Collaboration with, and input from, a broad group of stakeholders,"*
- The evaluation of a standard that *"reflects best practices for indoor residential water," or*

- An *"analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management"* that quantifies impacts.

The existing standards will save water through 2030 and contribute significantly to the requirement of the legislation to decrease water use below 20 by 2020 targets. We recommend that the standards remain at the current levels specified in the Water Code until additional analysis can be completed. Once the additional studies are completed, proposed indoor water use targets and implementation timeline for residential customers can be recommended if warranted.

Thank you for considering our comments and we look forward to continuing to work with you in evaluating indoor water use in California. If you have any questions about this letter please contact Elizabeth Lovsted, Water Resources Manager, San Diego County Water Authority at elovsted@sdcwa.org or (858) 522-6749.

Sincerely,

Carlos Lugo
General Manager
Helix Water District

Jose Martinez
General Manager
Otay Water District

Allen Carlisle
CEO/General Manager
Padre Dam Municipal Water District

Tom Kennedy
General Manager
Rainbow Municipal Water District

Clint R. Baze
General Manager
Rincon del Diablo Municipal Water District

Kelley Gage
Director of Water Resources
San Diego County Water Authority

Albert C. Lau
General Manager
Santa Fe Irrigation District

Jennifer Sabine
Interim General Manager
Sweetwater Authority

Glenn Pruim
General Manager
Vallecitos Water District

Gary Arant
General Manager
Valley Center Municipal Water District

Brett Hodgkiss
General Manager
Vista Irrigation District

From:	Aaron Dula
To:	DWR WUE Standards
Subject:	Comment on Indoor Water Use Study
Date:	Friday, June 4, 2021 3:25:01 PM

Good afternoon,

I appreciate the exhaustive study and comprehensive report. I found it to be very thorough and well thought out. I'd like only to comment on the effect of reduced indoor residential use on recycled water end users.

I'd suggest that rather than implementing a one-size-fits-all state-wide regulation, that there be exemptions for small water systems and communities that use their wastewater treatment plant effluent for landscaping, golf course irrigation, and other recycled water applications that in turn reduce further pumping of groundwater sources. Perhaps this would apply to those using surface source water as well.

If a community is supplying its own water to residents and utilizes recycled water, imposing use reduction regulations doesn't have the same beneficial effects. Additional water will have to be pumped from the ground to make up for the reduced volume of recycled water supplied.

I think exemptions should exist to promote recycling of water and reduced energy demands on the grid. Thank you for your time and care for a sustainable and quality future for all.

Best regards,

Aaron Dula

Director of Water Systems

The Santa Lucia Preserve

Carmel, CA 93923

831.620.6783 – office

831.238.4283 – cell

Santa Margarita Water District

May 28, 2021
Ms. Sabrina Cook
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

By email: WUEstandards@water.ca.gov

Re: IRWUS Report Comment Letter

Dear Ms. Cook:

The Santa Margarita Water District ("SMWD" or "District") appreciates the opportunity to participate in the workgroups and informational listening sessions associated with the development of the proposed indoor water use standard. After review of the "Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study" ("Draft Report"), we have several questions, concerns, and recommendations related to the methodology used and policy behind the findings of the draft Report.

California Water Code 10609.4(b)(1) requires that the Department of Water Resources ("DWR") conduct studies and investigations on the benefits and impacts of changing the standard for indoor residential water use. Important to note: the Water Code does not *require* DWR to change the standards. Based on the District's review of the draft Report, it is our view that DWR should rescind its recommendation to lower the indoor GPCD standard as the quality and scope of data used to estimate indoor water usage contains a significant amount of uncertainty while relying on assumptions and estimates to validate or substantiate changes to the indoor standards already established.

Summarized below for your review are comments, questions, and other points on specific aspects of the draft Report which provide rationale on why DWR should defer making any recommendation to change the existing indoor water use standard until more robust, collaborative, and quantitative studies occur.

Estimating Indoor Use and Disregard of Error or Uncertainty

The draft Report provides a lengthy narrative on the various methodologies used to *estimate* indoor water use from total home metered volumes. Because water suppliers meter a home and not the downstream end-uses, there are uncertainties, assumptions, and approximations used in the methodologies to back-out or "disaggregate" indoor and outdoor usage. While good techniques for estimating, they are just that, *estimates* of indoor water use. Each assumption and approximation have their own inherent uncertainty and significant margin of error.

Despite the draft Report acknowledging 1) that monthly aggregated data from only 157 of the 408 Suppliers (38% of all Suppliers) could be used to estimate indoor Gallos per Capita per Day ("GPCD") and 2) that errors and confidence intervals could not be developed for this dataset (pgs. 75-76), the draft Report nevertheless recommends lowering the indoor GPCD standard. The District finds it troubling that the draft Report disregards these known unknown errors and uncertainties yet develops

specific and reduced indoor GPCD standards. In short, the draft Report cannot propose to determine what an efficient indoor per capita value is when the document is not able to identify the error or uncertainty associated with estimating that value.

Moreover, since the indoor water use objective is tied to population (GPCD standard X supplier's Population), uncertainties and errors in population become magnified. First, the draft Report does not have the benefit of incorporating the most recent U.S. 2020 Census data. Having updated population information at the State and local level will be beneficial to understanding demographic patterns and trends which influence residential indoor water use. Secondly, the draft Report fully acknowledges that "the most defensible population estimates would have come from the 2020 census…" (pg. 75). The rush to promulgate new indoor GPCD standards without the benefit of updated U.S. Census data (soon to be available) is unsupportable.

Inappropriate Use of the Lower Quartile Median GPCD Estimate

The draft Report further compounds errors and uncertainties related to estimating indoor water use by selecting the lower quartile ("LQ") median GPCD value as the de facto standard for all water suppliers to achieve. As stated above, if the draft Report acknowledges the data used to estimate indoor GPCD is limited, does not avail itself to including estimates of error, and cannot demonstrate causation of findings, how then can it be concluded that if 25% of a limited sample size can obtain a GPCD of 43 (without knowing anything about how that LQ median GPCD was determined and/or achieved), all water suppliers ought to achieve and be held to that standard.

The selection of an LQ median standard discounts the amount of indoor residential conservation and efficiencies achieved by all water suppliers to this point in time. In fact, during and since the last drought, water customers have taken significant steps to reduce their indoor use through replacement toilets, appliances, plumbing fixtures and other means. More importantly, adopting a LQ median standard does not properly consider agency-specific future (and cost-effective) achievable indoor savings, which are directly tied to variables water suppliers have no control over, such as population, demographics, and customer end-use behavior.

No Quantitative Study to Assess Impact to Water and Wastewater Systems

The draft Report states that "…a quantitative analysis is beyond the scope of this study…" (pg. 8). A quantitative study is crucial to understanding Californian's water use. There is little rationale for accelerating the lowering of the indoor GPCD standard without taking the time and consideration to better understand the benefits and impacts to water supply, wastewater, and recycled water systems.

Without proper quantitative studies and the time to conduct them, a rushed qualitative study that has the effect of reducing non-discretionary indoor residential water use and the source for recycled water supplies, is arbitrary and capricious. The Water Code's dictate is to conduct studies and investigations on the benefits and impacts of changing the standard while the draft report does not appear to meet this requirement.

The District has invested extensively in the development, storage, and distribution of recycled water since the 1970's; so much so that recycled water makes up approximately 25% of the District's total water supply. Unwarranted or arbitrary reductions in indoor usage has a deleterious impact on wastewater which, in turn affects our ability to produce recycled water. This recycled water

will be the source water of approximately 15% of the District's ultimate potable demand through potable reuse projects the District is currently constructing.

Given the challenges climate change has and will continue to impose on California's regional water supplies and delivery systems, potentially limiting a vital local and reliable water supply such as recycled water, or affecting its quality, is not prudent water management.

Again, we appreciate the opportunity to participate in the process. We hope that it can continue while additional necessary and appropriate studies take place to ensure that the rationale for any changes to existing standards is sound and will result in actual improved efficiency and not restrictions for restrictions sake.

Sincerely,

Daniel R. Ferons
General Manager

City of Santa Rosa WATER

June 3, 2021

Submitted via: WUEStandards@water.ca.gov

Water Use Efficiency Branch
Department of Water Resources
P.O. Box 942836
1416 9th St, Sacramento, CA 95814

RE: Indoor Residential Water Use Standards Report Comment letter

Dear Water Use Efficiency Branch,

On behalf of the City of Santa Rosa Water Department (Santa Rosa Water) I am writing to provide comments to the California Department of Water Resources (DWR) on the *Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study* (Report).

Santa Rosa Water is an urban retail water supplier serving approximately 175,000 residents in Sonoma County. Santa Rosa has a long-standing commitment to drought preparation and water use efficiency, recognizing the vital role that long-term drought preparation and continued improvement in water use efficiency provide in maintaining a resilient water supply. During the 1976-1977 drought, Santa Rosa began implementing water conservation programs and hired our first Water Conservation Coordinator in the early 1990s to expand on our efforts. By the late 1990s we had established our first rebate and incentive programs for customers to encourage water conservation. Since, Santa Rosa Water has spent over $21 million on water conservation programs, including replacing over 56,000 toilets with ultra-low and high-efficiency toilets, performed over 3,000 indoor water use efficiency audits, and provided rebates for over 14,400 high-efficiency clothes washers.

Santa Rosa Water understands that DWR and the California State Water Resources Control Board (Water Board) had a statutory deadline of January 1, 2021 to conduct necessary studies and investigations on indoor residential water use standards (standards) and make a recommendation to the Legislature; however, prior to making these recommendations, Santa Rosa Water believes that DWR should 1) collaborate with, and include input from, water and wastewater agencies on the studies, investigations, and the final report, and 2) analyze the impacts on water and wastewater management of changing the indoor residential water use standard.

DWR Should Collaborate with, and Include Input From, Water and Wastewater Agencies.

In 2018, in response to Governor Brown's *Making Conservation a California Way of Life* Executive Order, a long-term water conservation framework was established through AB 1668 and SB 606. This landmark legislation included mandated studies, and technical and financial evaluations, which ultimately led to comprehensive water conservation regulations that built upon the already successful implementation of statewide 20% urban water use reductions by 2020 sought in the "Water Conservation Act of 2009." Santa Rosa Water was fully engaged in the coordinated effort between state agencies, water utilities, and other interested parties that shaped this framework.

As part of this stakeholder process, it was provided in AB 1668 that:

> *The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater and recycled water agencies.* Water Code § 10609.4 (b)(2).

While we appreciate that DWR held a day-long workshop on May 21st in response to concerns raised regarding compliance with the statutory requirement of collaborating with stakeholders on the "studies, investigations, and report," we believe that this should have occurred prior to DWR releasing the draft report. The draft report presented data and a recommendation of new indoor residential water use standards without the opportunity for stakeholders to provide input on the accuracy of data, the feasibility of the proposed standards, and potential impacts to our operations and infrastructure. Because this opportunity was not provided, Santa Rosa Water is concerned that compliance with the proposed indoor residential water use standard will not be feasible.

For example, the proposed standard assumes a passive indoor water savings of 0.5 gallons per capita per day (gpcd); however, given Santa Rosa's history of achieving water savings through implementation of indoor water conservation programs, this estimate may be unrealistic for us to achieve and will likely place costly burdens on our customers through increased water rates. The implementation of a lower residential indoor water use standard than what was provided for in the framework usurps its intent of allowing water providers the flexibility to design and implement water conservation programs that maximize water savings in their service area. While Santa Rosa Water remains committed to water use efficiency, we are concerned that the proposed indoor residential standard will not provide us the flexibility needed to achieve increased water savings. We would appreciate the opportunity to collaborate with DWR and the Water Board on ways we can maximize our efforts in achieving actual water savings, all while ensuring water remains affordable for our customers.

Santa Rosa Water recommends that DWR consider input from stakeholders in a meaningful way prior to making a recommendation to the legislature. We suggest that DWR and the Water Board work collaboratively with water and wastewater agencies in California to fully understand the data and reasonably analyze impacts of various standards, as well as, provide water providers the flexibility that is needed to design and implement water conservation programs that will maximize water savings in their service areas. Santa Rosa stands ready to work with DWR and the Water

Board to ensure that any new standard is feasible and appropriately reflects best practices, and actual possible results for a reduction in water use.

DWR Should Conduct Meaningful Analysis on the Impacts of a Changed Standard.

Santa Rosa Water supports a sensible and successful implementation of water conservation measures, including water use standards, however, we firmly believe that analysis should be conducted on the feasibility of a new residential indoor water use standard and the potential impacts to operations and rates prior to implementation of a water conservation standard.

AB 1668 requires:

> *The Studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.* Water Code § 10609.4 (b)(1).

The draft report indicates that a "quantitative analysis is beyond the scope" of the study. Due to the significant decrease in the proposed indoor residential water use standard and the potential for significant adverse impacts on water and wastewater management, Santa Rosa Water strongly encourages DWR to conduct a meaningful, quantitative analysis on the impacts of a changed standard prior to making a recommendation to the Legislature.

Setting a new indoor water use standard without adequate analysis has the potential to adversely affect wastewater management, including wastewater collection and treatment and recycled water reuse systems, infrastructure, and operations. Water and wastewater systems are designed and constructed, for a minimum level of flow. The unnecessary strain on the potable water system infrastructure from excessively low water use standards result in increased operational costs to flush pipes more frequently to prevent infrastructure damage leading to increased rates, and less water for recycling and reuse—a source of water often thought of as drought-proof.

Additionally, the necessity for a quantitative analysis has become even more imperative due to the impact that the COVID-19 emergency has had on residential water use. In 2020, Santa Rosa saw a 12 percent increase in residential use and a 7 percent decrease in commercial, industrial, and institutional use compared to the prior year. Other utilities in the region are seeing similar trends since the beginning of the pandemic. It is unclear whether this change in water use is permanent, however, prior to setting a new standard this potential water use pattern should be taken into consideration.

While we appreciate that DWR's draft report noted adverse impacts to water and wastewater management, it fails to quantitively analyze various standards to completely understand how adverse impacts can be minimized while achieving water savings. We propose that DWR withhold its current recommendation on indoor residential water use standards and work collaboratively with stakeholders over the next year to fully analyze the impacts of various standards and feasibility of implementation to protect our infrastructure as well as to ensure Californians have access to safe, clean, affordable, and accessible water.

We appreciate your consideration of these recommendations. Santa Rosa Water is committed to collaborating with DWR and the Water Board to successfully implement *Making Water Conservation a California Way of Life* and provide urban retail water suppliers flexibility in implementing water use efficiency measures as it was intended by the framework. Santa Rosa Water is a longstanding member of the Association of California Water Agencies (ACWA), which represents over 460 public water agencies that deliver approximately 90 percent of the water used in residential, commercial, and agricultural purposes in California. As a member agency, we fully support the comments and recommendations ACWA provided to the Water Use Efficiency Branch on the draft report.

If you have any questions, please feel free to contact Peter Martin, Deputy Director of Water Resources at (707) 543-4294 or PMartin@srcity.org.

Sincerely,

Jennifer Burke
Director of Santa Rosa Water