



**42 N. Sutter Street, Suite 506
Stockton, CA 95202
(209) 475-9550
www.restorethedelta.org**

August 9, 2017

Sent via email: board@valleywater.org

Randy A. Record, Chairman
Gloria D. Gray, Vice Chair
David D. De Jesus, Vice Chair
Judy Abdo, Board Member
Sylvia Ballin, Board Member
Peter Beard, Board Member
Gloria Cordero, Board Member
Donald L. Dear, Board Member
Stephen Faessel, Board Member
William Gedney, Board Member
Michael T. Hogan, Board Member
Russell Lefevre, Board Member
Michele Martinez, Board Member
John T. Morris, Board Member
Glen Peterson, Board Member
Marsha Ramos, Board Member
Zareh Sinanyan, Board Member
Charles Treviño, Board Member
Robert Wunderlich, Board Member
P.O. Box 54153
Metropolitan Water District
Los Angeles, CA 90054-0153

Linda Ackerman, Vice Chair
John W. Murray, Jr., Vice Chair
Steve Blois, Secretary
Richard Atwater, Board Member
Brett R. Barbre, Board Member
Michael Camacho, Board Member
Glen Dake, Board Member
Larry Dick, Board Member
Donald Galleano, Board Member
Mark Gold, Board Member
Cynthia Kurtz, Board Member
Keith Lewinger, Board Member
Larry McKenney, Board Member
Lorraine A. Paskett, Board Member
Jesús E. Quinoñez, Board Member
Elsa Saxod, Board Member
Fern Steiner, Board Member
Leticia Vasquez, Board Member
Janna Zurita, Board Member
P.O. Box 54153
Metropolitan Water District
Los Angeles, CA 90054-0153

Subject: Metropolitan Water District Participation in California WaterFix

Dear Chair Record, Vice Chairs, and District Board Members:

Restore the Delta advocates for local Delta stakeholders to ensure that they have a direct impact on water management decisions affecting the water quality and well-being of their communities, and water sustainability policies for all Californians. We work through public education and outreach so that all Californians recognize the Sacramento-San Joaquin Delta as part of California's natural heritage, deserving of restoration. We fight for a Delta whose waters are fishable, swimmable, drinkable, and farmable, supporting the health of the San Francisco Bay-Delta Estuary, and the ocean beyond. Our coalition envisions the Sacramento-San Joaquin Delta as a place where a vibrant local economy, tourism, recreation, farming, wildlife, and fisheries thrive as a result of resident efforts to protect our waterway commons.

We have been involved with nearly all facets of the California WaterFix project, and before that the Bay Delta Conservation Plan unveiled by Governor Jerry Brown in July 2012. We understand that your Board will be asked this fall to approve participation in the California WaterFix tunnels project, which, if constructed and completed, would be integrated into the broader operations of both the California State Water Project (SWP) and the federal Central Valley Project (CVP).

There has been a proliferation of accounts from California WaterFix supporters about how much water this project will generate for participating agencies. The President of Kern County Water Agency has stated that KCWA anticipates 1 million acre-feet of additional water supplies, yet he did not clarify if that amount was to be divided by all participating members or delivered to KCWA alone. Goldman Sachs officials told a Westlands Water District workshop in July there would be an average increased yield of 1 million acre-feet of water total from WaterFix for all participating members. At the State Water Resources Control Board water rights permit hearings for California WaterFix, DWR and the Bureau presentation indicated that the SWP would receive an additional 200,000 acre-feet of water on average, according to their models. MWD's second white paper on WaterFix operations estimates up to 500,000 acre-feet of additional water on average from CA WaterFix. MWD's 2015 Regional Urban Water Management Plan indicates an average of 248,000 acre-feet in reliable supplies are expected from WaterFix through 2040.

Such divergent and contradictory statements regarding increases in water yield from California WaterFix need to be questioned by MWD member agencies because Southern California ratepayers deserve to know—with more precision than presently available from WaterFix supporters—how much additional water they will receive in return for paying about half of WaterFix's \$17 billion construction cost.

We are aware that Metropolitan Water District imports about 30 percent of its supplies on average from the Delta. That amount represents 48 percent of average total State

Water Project supplies exported directly from the Delta between 2005 and 2014. We further understand that MWD managers are in negotiations at this time regarding California WaterFix, and that various approaches to water allocation, financing, accounting, and payment for benefits received from the tunnels project are under consideration. As we understand it, south of Delta SWP contractors are assumed to participate in California WaterFix, unless they opt out of the project. **So—the key decision MWD board members must face is whether to opt out of WaterFix participation.**

Elsewhere, water officials have expressed concerns that if their water agency were not to participate in the California WaterFix project, a water grab at their agency's expense could ensue. We understand that MWD board members may have understandable concerns regarding how to secure a sustainable water supply with changing climate conditions. We think that concerns over a water grab (should MWD opt out of WaterFix) are baseless and unfounded, intended to scare decision makers into California WaterFix participation. Instead, opting out of California WaterFix will neither undermine nor change the amount of water a district like Metropolitan would continue to be legally entitled to from the SWP through its existing water service contract. The District would also avoid increased imported water costs beyond what might occur with your present SWP contract because it would have no incremental cost of WaterFix-delivered water. Those savings could continue to be available for its other water supply priorities, that are much more drought resilient in a changing climate, projects such as storm water capture, groundwater recovery, and reclamation/recycling investments. Our attached comments address this issue as well as a number of other aspects of the tunnels project.

Decision making about California WaterFix will be all about managing risk and evaluating facts—not allowing the influence of unfounded rumors, half-truths, and glossy presentations short on substance. The scale of this project is so large that risk issues arise in many contexts—legal, organizational/management, intergenerational, water supply, environmental, economic/fiscal, scientific, and social. Our comments on a variety of risks are found in Attachment 1 to this letter.

Moreover, the project's scale is so large that the MWD Board of Directors's decision to participate in WaterFix will have consequences beyond its member agencies, customer base, and service area. MWD management's white papers on California WaterFix contend that the project will save the Delta. If so, WaterFix will likely destroy the Delta in order to supposedly "save" it.

Your decision to participate would take in the Delta itself. That is why Restore the Delta feels compelled to communicate our views about the many "selling points" advanced by DWR and MWD management. We also summarize who in the Delta's environmental justice communities would be harmed—and how, such as from salinity intrusion to drinking water quality impacts on Stockton, and over a decade's worth of construction impacts—in Attachment 2 to this letter. (This and other information was provided in

greater detail to the State Water Board by Restore the Delta in December 2016 as part of the California WaterFix's water rights change petition proceeding. We appreciate you considering this information on Delta people as MWD decides on WaterFix.)

There are viable, less expensive, and far less risky water supply investments than California WaterFix. We provide cost comparison information for alternative water supply and efficiency sources in Attachment 3 to this letter. We hope you will consider this information as you deliberate on MWD's participation decision.

In Attachment 4 to this letter, we provide summary information on California water solutions that address supply reliability and drought resistance.

Thank you for considering our comments and viewpoints. You have a difficult decision to make, one that will affect Delta residents, MWD customers throughout Southern California, and indeed all California residents for generations to come. If you have questions or concerns about our comments, do not hesitate to contact Barbara Barrigan-Parrilla (209.479.2053, barbara@restorethedelta.org) or Tim Stroshane (510.847.7556, tim@restorethedelta.org).

Sincerely,

 Barbara Barrigan-Parrilla Executive Director	 Tim Stroshane Policy Analyst
----------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------

cc: Jeff Kightlinger, General Manager, Metropolitan Water District

Attachments:

1. Specific Restore the Delta Comments on Risks of California WaterFix.
2. Summary of Delta Environmental Justice Communities and California WaterFix Impacts.
3. Cost Comparisons Among Alternative Water Supply and Efficiency Sources.
4. California Water Solutions.

Attachment 1 SPECIFIC RESTORE THE DELTA COMMENTS ON THE RISKS OF CALIFORNIA WATERFIX

A large evidentiary record generated by the water rights change petition for California WaterFix before the State Water Resources Control Board (SWRCB) helps shed light on at least some of the issues that the District weighs, particularly with regard to climate change, Delta flows, impacts to legal users of water, environmental justice, and project design, construction and operations. In addition, two recent biological opinions provide additional updated information about the project as well. The proceeding will continue well into 2018 before the SWRCB issues an order on the WaterFix petition.

What water supply yield is expected from California WaterFix? What yield could Metropolitan Water District expect to see if it participated?

In recent months, California WaterFix supporters, including the California Department of Water Resources (DWR), the U.S. Bureau of Reclamation (the Bureau), and the Metropolitan Water District of Southern California (MWD) have issued documents or given presentations indicating that the yield of the WaterFix project is expected on average to be between 4.7 million acre-feet to 5.3 million acre-feet annually. MWD expresses its belief that combined future SWP and CVP average annual exports from the Delta could potentially decrease to 3.5 to 3.9 million acre-feet from the current average of 4.9 million acre-feet. With California WaterFix, using its vaunted “big-gulp, little-sip” theory of operation, MWD informed its Board that annual exports would range between 4.7 to 5.3 million acre-feet.¹

WaterFix’s future export reductions are expected from application of greater water quality and endangered species restrictions. Elsewhere, DWR has complained that because of “regulatory restrictions” (primarily biological opinions concerning endangered fish issued in 2008 and 2009) Delta exports have been reduced by 10 percent from their previous historical levels.² These restrictions came about because of scientific studies of rare and endangered fish and other species throughout the Delta, and they represent contemporary application of “adaptive management” and science to the operations and features of state and federal project facilities (storage, pumping plants, and conveyance).

¹ Metropolitan Water District of Southern California and California WaterFix, “Modernizing the System: California WaterFix Operations,” Second White Paper, July 2017 p. 4. Accessible at http://mwdh2o.com/DocSvcPubs/WaterFix/assets/ca_waterfix_operations_07_2017.pdf.

² California Department of Water Resources [DWR], *The State Water Project Draft Delivery Capability Report 2015*, April 2015, p. 6. Accessible at <https://msb.water.ca.gov/documents/86800/144575dd-0be1-4d2d-aeff-8d7a2a7b21e4>, with appendices <https://msb.water.ca.gov/documents/86800/c97c3baa-0189-4154-bf19-aa88392026ac>.

As revealed in a Goldman Sachs presentation given at a July 17 workshop held by Westlands Water District, WaterFix supporters anticipate that the marginal water supply benefit of the Tunnels would be about 1 million acre-feet on average (that is, the difference between about 3.9 million acre-feet of Delta exports in the future and a near mid-point of the future range of Delta exports including use of WaterFix tunnels, or about 4.9 million acre-feet).³ MWD appears to believe, in its 2015 Regional Urban Water Management Plan, that its average annual deliveries from WaterFix will be about 248,000 acre-feet per year.⁴

California WaterFix claims “adaptive management” as an imaginary “hall pass” to inoculate itself against unforeseen impacts, in the belief that whatever scientific results come about, they will protect fish and Delta communities from Tunnels operations.

Despite their dislike of water quality and fish protection regulations, DWR, the Bureau, and MWD include an “adaptive management” framework in WaterFix that they expect is politically critical to permit approval and future operation of WaterFix tunnels and north Delta diversions. This is problematic because DWR, the Bureau and MWD would like to greenwash the WaterFix project with a veneer of science geared to solve future challenges, yet they already decry regulatory restrictions that have reduced exports at present. CWF supporters want it both ways: to have the greenwashing benefits of “adaptive management” while complaining that scientific results impose restrictions on their water project diversions. ***Whatever your view of regulations on State Water Project (SWP) and State Water Project (CVP) operations, this is a source of future regulatory risk to water supply yield and financial soundness for WaterFix.*** What will be the consequences for Metropolitan Water District investment opportunities—if the project goes forward and then WaterFix exports have to be curtailed because of water quality and fish protection needs?

There is also climate change risk to future water supply. DWR and the Bureau claim that California WaterFix responds to climate change risks to state water supply, but really, the project is highly vulnerable to both drought and flood extremes.

The kernel of truth of WaterFix talking points is for the project to divert as much storm flow as possible to storage south of the Delta, so that storage during drought is harbored as carryover to protect water quality and ecosystems in the Delta, as well as

³ Accessible at https://www.nrdc.org/sites/default/files/media-uploads/delta_tunnels_goldman_analysis.pdf.

⁴ Metropolitan Water District of Southern California, *2015 Regional Urban Water Management Plan*, Tables A.3-7 from pp. A.3-53 through A.3-57. Accessible at http://mwdh2o.com/PDF_About_Your_Water/2.4.2_Regional_Urban_Water_Management_Plan.pdf.

to preserve storage for project customers over long-term droughts.⁵ The trouble is, climate change poses the problem of whether high flows will be frequent enough so they can be captured for a big supply gulp, or if water diverted and stored for later supply can outlast the duration of future droughts. ***No one knows with certainty how this climate change risk will play out for the Central Valley water system.*** The truth is that the Tunnels are an expensive, flood- and drought-vulnerable, and therefore very risky investment whose capital costs at a minimum must be paid every year, rain or shine.

Metropolitan Water District's share of State Water Project contract yield (Table A deliveries) between 2005 and 2014 was about 48 percent of the SWP's total period average of 1,837 thousand acre-feet of south-of-Delta exports—880,699 acre-feet on average. MWD's 10-year average percent of its total SWP Table A deliveries was 46 percent.⁶ During the first two years of the recent drought (2013 and 2014) MWD imports were 32 percent and 3 percent respectively of MWD's Table A amount.

DWR's State Water Project Delivery Capability Report (2015) shows MWD made good use of both carryover storage. However, "Article 21" surplus water has dwindled dramatically with recurrent droughts between 2005 and 2014, a harbinger of climate change's impacts on that type of SWP deliveries. Carryover storage will likely continue to be an important source of surface imports from the SWP for MWD in the future. MWD's carryover deliveries averaged about 87,000 acre-feet over this period, with only one year when no carryover was available (2008).

SWP turnback pool deliveries peaked dramatically for MWD in 2013 at 323,000 acre-feet, but fell to zero in 2014 during the recent drought, but otherwise fluctuated with the needs of other SWP contractors in the system. Between 2005 and 2012, these deliveries were typically less than one percent of total MWD imports from the SWP. Overall, MWD's annual SWP import deliveries averaged 1,080,734 acre-feet between 2005 and 2014. The MWD 2015 regional urban water management plan (RUWMP) indicates that imports from the SWP will rise about 5 percent on average from 1.555 million acre-feet (MAF) in 2020 to about 1.632 MAF in 2040, without California WaterFix.⁷ Other SWP improvements, including California WaterFix, would add another 268,000 acre-feet from 2030 through 2040.

"A high proportion of Metropolitan's revenues come from volumetric water sales," says MWD's RUWMP. "Water sales revenues are approximately 80 percent of Metropolitan's

⁵ *Ibid.*, p. A.3-27, where MWD states, "Metropolitan's strategy is to reduce its dependence on SWP supplies during dry years, when risks to the Bay-Delta ecosystem are greatest, and to maximize its deliveries of available SWP water during wetter years to store in surface reservoirs and groundwater basins for later use during droughts and emergencies." This is "big-gulp, little sip" from MWD's viewpoint.

⁶ DWR, State Water Project Delivery Capability Report, 2015, data from Tables 7-2 through 7-11.

⁷ MWD's 2015 Regional Urban Water Management Plan, Table 2-6, p. 2-17.

total revenues.”⁸ In Fiscal Year 2015, water sales came to \$1.044 billion and in FY 2016 (a wetter year) to \$856 million. MWD also relies to a lesser degree for stabilizing fluctuations in water sales on its ad valorem property tax and various charges it adds to water sales (see Attachment 3 to this letter below): its “Readiness-to-Serve” and “Capacity” charges, MWD states, are about 18 percent of total revenues on average.

In MWD’s quest to bolster its State Water Project imports via California WaterFix, it appears to us that there is considerable risk to MWD water sales. MWD imports are quite expensive to most of its member agencies, even by urban southern California standards. At least four of MWD’s largest member agencies are actively planning to reduce on average their MWD imports on both cost and reliability grounds. These agencies state:

“Along with Metropolitan’s reliability initiatives, **Central Basin [Municipal Water District]** has also taken important steps during the past decade to reduce its service area’s vulnerability to extended drought and other potential threats. Central Basin’s investments in recycled water to reduce imported water for non-potable uses and the implementation of conservation devices and school education programs have resulted in more self-reliance within the region.”⁹

“The **[San Diego County] Water Authority** and member agencies must continue to strive to develop cost-effective local resources that can further diversify the region’s supplies and reduce demands for imported water from Metropolitan.”¹⁰

“The **[Los Angeles Department of Water and Power]** Urban Water Management Plan...projects, through additional local supply development and conservation savings over the next 25 years, that LADWP’s reliance on MWD water supplies will be reduced significantly from the current five-year average of 57 percent of total demand to 11 percent under average weather conditions and to 44 percent under single-dry year conditions by [fiscal year ending] 2040.”¹¹

⁸ *Ibid.*, p. 2-30.

⁹ Central Basin Municipal Water District, 2015 Urban Water Management Plan, Final Draft, May 2016, p. 3-15. Accessible at <https://www.centralbasin.org/sites/default/files/file-attachment/FINAL%20CBMWD%20UWMP%20June%202016.pdf>.

¹⁰ San Diego County Water Authority, *2015 Urban Water Management Plan*, June 2016, p. 9-10. Accessible at <http://www.sdcwa.org/sites/default/files/UWMP2015.pdf>.

¹¹ Los Angeles Department of Water and Power, 2015 Urban Water Management Plan, April 2016, p. 8-1. Accessible at https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=QOELLADWP005416&RevisionSelectionMethod=LatestReleased.

“Although the **City [of Santa Monica]** desires to become independent of imported water, the City expects supply reliability during a three-year drought as groundwater may be extracted.”¹²

If MWD does not participate in California WaterFix, MWD managers would continue to maximize MWD's State Water Project deliveries—including Table A deliveries, carryover storage, and supplemental supplies from the turnback pool and surplus waters whenever they come available. They would also continue to manage MWD supplies from the Colorado River Aqueduct, local surface supplies, and long-term conjunctive groundwater storage. Contract-based allocations from the SWP would continue for the remainder of its terms. ***Climate change demands a new path to local self-reliance in water supplies. Using one external watershed to make up deficits of another is not a sustainable climate change strategy.*** Clearly MWD member agencies understand the need to become as self-sufficient as possible managing their local water supplies. An expensive water importation system like WaterFix will be susceptible to climate change extremes, making incremental water gains extremely expensive and imported water sales necessary, and fails to complement member agencies' policies and programs promoting regional self-sufficiency. MWD needs to catch up with these agencies.

What is involved with MWD participation? How does it work?

With this context in mind, MWD must carefully evaluate its participation in California WaterFix. ***Reviewing potential participation terms for both CVP and SWP contractors is important because the feasibility of California WaterFix financing, construction and operations depend on the overall number and demand of contractors from both projects deciding to participate. The more contractors who participate, the more across which WaterFix's high costs could be spread.***

The U.S. Bureau of Reclamation (which owns and operates the federal Central Valley Project) will not finance, own or operate the WaterFix. Cindy Kao, Santa Clara Valley Water District's (SCVWD) imports program manager, informed her district board on July 11, 2017, that on one hand, the federal Central Valley Project's terms of participation would entail any CVP contractor “opting in” to WaterFix, while as a south-of-Delta State Water Project contractor, her district would have to opt out of WaterFix if it did not wish to participate (see below, “SWP Contractor Participation”). Ms. Kao's description of these general terms are consistent with what Restore the Delta staff heard at a public workshop held by Westlands Water District on July 17.

CVP Contractor Participation. Opting in through the Bureau, CVP water contractors would receive a post-hoc accounting of WaterFix diversions for which they would pay extra above and beyond their CVP contract terms. The Bureau would work with DWR to

¹² Santa Monica 2015 Urban Water Management Plan, p. 8.3. Accessible at https://www.smgov.net/uploadedFiles/Departments/Public_Works/Water/2015_UWMP_Final_June_2016.pdf.

determine what the actual increment of water was necessarily diverted by WaterFix in the water year, and what amount of water could have been diverted and stored by existing state and federal facilities. Then through post-hoc accounting, these CVP contractors would be billed extra for the increment of supplies they received that would be attributable operationally to WaterFix.

Crucially, the Bureau at the Westlands public workshop stated that if post-hoc modeling and accounting determined that the water year was wet enough, despite having used WaterFix to divert water—and if water allocations could have been handled without use of WaterFix—then whatever water diverted to storage by WaterFix would be converted to standard CVP supplies (for example, at San Luis) and accounted for under normal water allocation procedures for that wet water year.¹³ The capital costs of WaterFix however would still have to be paid by WaterFix participating contractors. MWD board members should ask MWD management if something like this accounting method will be employed by DWR, and whether there will be impacts on MWD from it.

It is important to remember that what happens with CVP contractors “opting in” to WaterFix is vital to whether SWP contractors find WaterFix an affordable investment.

SWP Contractor Participation. Unlike the Bureau, DWR anticipates owning and operating the tunnels as part of the SWP. In the case of SWP water service contracts, WaterFix participation would be assumed by DWR for SWP contractors located south of the Delta. Any of them could opt out, as we understand it, and this understanding was publicly stated to the SCVWD Board by Ms. Kao on July 11. This “opt out” option for SWP contractors was reiterated at the Westlands Water District workshop on July 17. And whether or not SWP contractors opted out of WaterFix accounting through DWR, they would retain their normal water service contract relationship with DWR and all non-WaterFix allocations from the SWP would be honored by DWR.¹⁴

Water officials have expressed concerns that if their water agency were not to participate in the California WaterFix project, a water grab at their agency’s expense could ensue. We understand that MWD board members have understandable concern regarding how to secure a sustainable water supply with changing climate conditions. We think that concerns over a water grab (should MWD opt out of WaterFix) are baseless and unfounded, intended to scare decision makers into California WaterFix participation. Instead, opting out of California WaterFix will neither undermine nor change the amount of water to which a district like Metropolitan would continue to be legally entitled through its existing water service contract. MWD would also avoid increased imported water costs beyond what might occur with your present SWP

¹³ This type of accounting change raises the specter of WaterFix participants getting water from the project, having it convert post hoc to regular allocation status, and still having to pay for the Tunnels.

¹⁴ And if any contractor’s regular SWP water service contract was not honored by DWR for any reason, the contractor would likely have strong legal grounds for a breach of contract suit against DWR.

contract because it would have no incremental cost of WaterFix-delivered water. Those savings could continue to be available for other District water supply investment priorities, that are much more drought resilient in a changing climate. Such projects would include storm water capture, groundwater recovery, and reclamation/recycling investments.

Risk Management and California WaterFix

Physical Risks to Delta Diversions. DWR, the Bureau, and MWD management also claim that California WaterFix allows flexible pumping operations in a dynamic fishery environment, and complies with salinity and flow criteria required by the State Water Board.

There are other physical risks in the State Water Project that DWR and MWD prefer not to emphasize. Most recently, Oroville Dam—the system’s flagship reservoir north of the Delta—has emerged as a facility facing a lot of uncertainty as to its future operational safety and integrity. Lake Oroville is the source of stored water that is exported from the Delta for use by contractors such as MWD. As you are doubtless aware, the reservoir’s spillway suffered catastrophic damage last winter during releases amid heavy runoff from the Feather River Basin. While DWR has hired a contractor to replace the spillway in time for next winter, questions about the integrity of Oroville Dam itself have emerged from independent consultant review of dam safety and federal regulatory inspection reports. Whatever comes of the independent review, it is likely that state water contractors, who are responsible for paying the State of California for the costs of operating, maintaining and repairing SWP facilities, will face a bill of unknown proportions. MWD would be wise to harbor its financial resources for just such a “rainy day” purpose. Loss of Oroville would set back long-term imports to MWD—with or without WaterFix, and with or without MWD participation in WaterFix—for years.

As important are the human-behavior reasons that problems with Oroville’s spillway—and potentially the dam itself—have emerged in recent months. The spillway’s “root causes” followed a fatal, if long-term sequence of events:

- There were construction mistakes made: the spillway’s concrete slabs were constructed over a foundation that included compacted clays over bedrock, when earlier design drawings had called for encasing the bedrock in concrete, not soft, pliable clays. “DWR used compacted clayey material (fines) to level the irregular subsurface rock grade,” which was highly erodible
- Drain lines were emplaced in spillway slabs, causing the slabs to be thinner and weaker, and which contributed to poor control of drainage under the slabs which contributed in turn to erosion of the fine clay material. This undermined structural integrity of the spillway over time.

- Slab anchors (L-shaped steel beams) that attached the spillway to its (problematic) foundation also contributed to failure.
- Poor drainage and slab-cracking led to water corroding steel-reinforcement within the concrete slabs, while erosion of the poor quality foundation materials undermined structural support for the spillway itself.¹⁵

After a hole in a seam appeared between spillway slabs in the downhill section of the Oroville spillway, flood releases through the control gates in early February resulted in the catastrophic blow-out of the spillway, which led to the evacuation order February 13.

On the afternoon of August 1, 1975, the vicinity around Oroville Dam was hit by a significant earthquake, with Richter scale magnitude of 5.7.¹⁶ The quake left many people wondering for a time about the seismic safety of Oroville Dam. Those fears have been rekindled and reignited by this winter's experience and revelations about the history of how DWR managed the Oroville Dam spillway. Additional questions are being raised about the spillway's control gates structure (with many anchor tendons in sub-par condition) and about the Dam itself (a massive earthen dam where vegetation grows from the dam face and vertical runoff patterns are observable on its face).¹⁷ They are especially relevant when the scenario of a perfect storm is posed as a high runoff period coupled with an earthquake of potentially larger magnitude in the Oroville area: Does DWR have emergency response plans in place for such an event, and has the Department done all it can to ensure survivability of all of the Dam and Spillway structures? In the back of water contractors minds should also be the question: will my District's customers have to pay for any disaster at Oroville that such an event might pose?¹⁸

What do Oroville's problems have to do with WaterFix risks? WaterFix would be owned and operated by the owner of Oroville Dam, the California Department of Water Resources. DWR is singled out in the "root causes" analysis for its failure to recognize

¹⁵ Robert G. Bea and Tony Johnson, "Root Causes Analyses of the Oroville Dam Gated Spillway Failures and Other Developments," Center for Catastrophic Risk Management, University of California at Berkeley, July 20, 2017, Appendix B, pp. 1-10. Accessible at <http://alumni.berkeley.edu/california-magazine/just-in/2017-07-27/bob-bea-takes-us-deep-dive-through-his-dire-oroville-report>.

¹⁶ California Department of Water Resources, *Bulletin 203-78: Performance of the Oroville Dam and Related Facilities During the August 1, 1975, Earthquake*, April 1977, p. 3. Accessible at <https://archive.org/details/up8performanceoforo203calirich>.

¹⁷ Bea and Johnson, *op. cit.*, opening section, pp. 11-16.

¹⁸ We note too that a 2016 California Water Commission Annual Review of the State Water Project reported on seismic remediation work occurring at Perris Dam and related facilities in southern California. p. 11. Accessible at https://cwc.ca.gov/Documents/2017/2016_SWPReview_Final.pdf.

and prevent conditions at the spillway that were visible, annually inspected, and potentially fatal to the spillway structure's integrity.¹⁹

Restore the Delta understands that past actions (or inactions) are not necessarily predictive of future performance. But we are concerned—and it should concern every district and agency considering WaterFix participation—that DWR so poorly managed its Oroville spillway, especially since the spillway is above ground. The tunnels of California WaterFix will not be visible for easy inspection.

In a recent “White Paper” on WaterFix “infrastructure”, MWD management acknowledges that the project is only about 10 percent designed at present, and that there would be a waste of water associated with the Tunnels design and operation. On page 24, MWD estimates seepage flow from external groundwater into the tunnels (about 1/10 of a percent of a 2.4 million acre-foot average annual estimate); however, this passage also acknowledges that there could be leakage from the tunnels into surrounding sediments and muds as well.²⁰

So, even MWD management does not expect the WaterFix to be water-tight. As a policy matter, this is an acknowledgement of water waste and could be a problem during dry and drought years, presenting a litigation risk in the future. In practical terms, constant leakage could have negative impacts under Delta levees and soils for neighboring properties leading to public safety issues, and could be an even more problematic cause for future litigation.

WaterFix supporters have long touted the need for the Tunnels as a hedge against seismic risk, but MWD's white paper recognizes that below-ground geotechnical studies are far from complete. This means they do not know for certain what conditions exist underground, and whether there would be adequate geology through which to put two 40-foot diameter tunnels. These are pressing, uncertain construction cost matters that should make MWD officials skeptical. The white paper's findings that the Tunnels would be constructed well under peat soils is based on some 240 geotechnical borings and other studies conducted to date. However, MWD acknowledges that another 2,000 more geotechnical investigations must be completed to gain a clear picture of what's under the surface. It will take a few years to complete these geotechnical studies,

¹⁹ *Ibid.*, Appendix B, p. 11. About DWR's role, the consultants conclude, “**Given the evidence of the findings in this report, the Oroville Spillway was destroying itself over time until the weakest section would finally give way.** This engineering situation was completely preventable. Recognition, Remedial Action, Correction, and the ultimate restoration of the spillway's structural integrity should have resulted many decades ago, especially when U.S. Bureau of Reclamation was warning dam owners of the dangers” of the combined potential catastrophic effects of sub-spillway erosion, structural undermining, and powerful penetrating flow of water in and under the spillway making failure more and more likely with each passing spillway release over the years. Emphasis added.

²⁰ of Southern California, *Modernizing the System: California WaterFix Infrastructure*, July 2017, p. 24. Accessible at http://mwdh2o.com/DocSvcsPubs/WaterFix/assets/cawaterfix_infrastructure_070317a_final_submit.pdf.

analyze the results, and translate the findings into management decisions informing design and controlling cost and risk.

Consequently, when the MWD white paper's authors state in their conclusion on page 29, "For California WaterFix, the key risk areas have been identified, and tools to mitigate these risks have been incorporated into the project's risk management process," MWD management is NOT saying that they have definitively controlled cost risk. Such a statement cannot be made because costs may increase as they learn more about how to adequately manage logistical and construction risk. They are saying only, "don't worry, we're doing what we can to take all risks into account as we do more geotechnical work. Trust us." In short, MWD continues to sell their "adaptive management" strategy as a proactive approach in order to secure funding before completing approximately 88% of the remaining geotechnical research needed to understand the full scope of the tunnels' design and construction risks, and their ultimate cost.

In short, construction risks and costs are de-emphasized by MWD to encourage skeptical decision makers to choose funding the WaterFix. Water districts should understand that a yes vote to fund the proposal issues a multi-generational commitment to a project situated in a watershed whose runoff and supplies are expected to decline with climate change throughout the 21st century.

If the District does not participate in California WaterFix, MWD will continue to have rights to SWP imports through its existing water service contract with DWR. The District would forego the complexities, risks, and liabilities it would take on by participating in the project. ***We think fixing the infrastructure that we already have should take priority over a new and expensive project like California WaterFix.*** Consequently, the District would have greater financial flexibility to undertake other investments that reduce the many risks to its imported and locally managed supplies, as well as its other responsibilities in the areas of water conservation, water recycling, local surface supplies, and regional groundwater recovery and management.

What about WaterFix reducing earthquake risk?

DWR and the Bureau claim that WaterFix will protect California's water supply from earthquakes that would cause numerous catastrophic Delta levee failures.

And yet, in 1975, as we mentioned above, there was a 5.7 magnitude earthquake whose cause was at least partly attributed to the existence of Lake Oroville having been filled in recent years. San Luis Reservoir—from which the District draws its CVP allocation—crosses an active Ortigalita Fault, and the California Aqueduct crosses the San Andreas Fault north of Los Angeles. The South Bay Aqueduct crosses the Calaveras Fault in southern Alameda County. These facilities are at far greater direct seismic risk than are Delta levees.

The Delta has no major active faults within about 60 miles. The 2014 Napa quake (6.0 magnitude) caused no levee damage in the Delta. The 1989 Loma Prieta earthquake (magnitude 6.9 on the Richter scale) caused no levee damage in the Delta, despite the extensive damage it caused in the Bay Area.

If MWD does not participate in WaterFix, it would be more able to afford to invest in maintenance, retrofit, and repairs to Delta levees MWD owns now, and to other existing SWP facilities, especially in light of events at Oroville Dam.

Will participating in the Joint Powers Authority and a Public-Private Partnership address these risks and the financial risks of the WaterFix adequately?

Nobody knows with certainty right now what the vehicle of participation in WaterFix will look like. Each MWD board member may be deciding on MWD's participation without knowing what any other water contractors in either project will decide for themselves. As a result, right now, California WaterFix faces enormous financial headwinds to pay for its \$17 billion price tag. How might its financing be arranged?

MWD's first "infrastructure" white paper points to the Central Coast Water Authority (CCWA) as the type of governmental vehicle for organizing design, construction, and operation of the California WaterFix Project. But the California Water Impact Network (C-WIN), based in Montecito, California, views CCWA's experience developing its Coastal Aqueduct to bring SWP Coastal Branch deliveries to eastern Santa Barbara County communities in the late 1980s and early 1990s as a cautionary tale at best.

According to C-WIN, the project suffered steep cost overruns, ran well over schedule, and today is barely used by several of the member agencies because it does not supply water from the State Water Project during droughts.²¹

Water agencies supporting WaterFix are already organized as joint powers authorities (JPAs) for a variety of purposes. As you are likely aware, JPAs are a legal way for public entities to share and spread financial and legal risk and pool their financial power and legal reach, while undertaking activities of mutual interest and concern among multiple governmental entities.²² They are allowed by law to issue revenue bonds without local voter approval.²³ This bonding authority makes JPAs ideal public partners for public-private partnerships (P3s) organized to undertake infrastructure projects like water tunnels, since the public side of funding an infrastructure need not face voter scrutiny—and private funding almost never does.

²¹ California Water Impact Network, "The Coastal Branch: A Cautionary Tale," accessible at <https://c-win.org/c-win-the-coastal-branch-a-cautionary-tale/>.

²² California State Legislature, Senate Local Government Committee. 2007. *Governments Working Together: A Citizen's Guide to Joint Powers Agreements*. August, p. 11. Accessible at sgf.senate.ca.gov/sites/sgf.senate.ca.gov/files/GWTFinalversion2.pdf.

²³ *Ibid.*, p. 13, 19.

A 2015 Brattle Group study showed that the Tunnels project “does not produce benefits in excess of costs for most agricultural water users.”²⁴ Among other things, this draft report informed the state of California that WaterFix would require subsidies for agricultural customers. If agricultural water users will not commit to funding it, this leaves a significant gap in financing the Tunnels project.

That is where a P3 may come in: a private construction firm could bring not only their construction engineering and management expertise to the Tunnels project, they could help finance the Tunnels. P3s are legal in California (California Government Code Section 5956.4).

Many pitfalls await JPAs and their offspring, P3s. Two pitfalls in infrastructure planning and politicking are the government’s tendencies to underestimate project costs and overestimate demand²⁵ for what the infrastructure produces (in this case, a water tunnel), and sharing the burdens of JPA legal liabilities.

Seattle, Washington, has recent experience with a tunnel project, a boring machine, and a P3 used to finance and construct the tunnel. The Seattle tunnel project was to replace the Alaskan Way Viaduct along the city’s waterfront, a single deep-bore tunnel to contain two levels of traffic with a large diameter of 57.5 feet, 1.7 miles long. (By comparison, WaterFix Tunnels would be 40 feet in diameter, two bores, about 35 miles in length.) Beginning to dig in July 2013, the boring machine struck a metal pipe and overheated, and could not back up (a concrete wall had been installed behind it). The machine had to be excavated, disassembled, repaired and reassembled— **a process that took two years**. The tunnel’s new completion date is early 2019; the schedule slipped, and the political and legal controversy over who is responsible for cost overruns of the project will go on for years to come. A P3 was the vehicle used to organize, finance, and construct the project.²⁶

Then there is potential for conflict among the member agencies that make up a JPA. For instance, are all members responsible if the JPA, acting in their names, gets sued for

²⁴ Brattle Group. 2015. *CalWater Fix Economic Analysis DRAFT*. Prepared for California Natural Resources Agency by David Sunding. November 15, p. 2. <http://www.restorethedelta.org/wp-content/uploads/2016/09/CA-WaterFix-Economic-Analysis-Sunding.pdf>.

²⁵ Flyvbjerg, B., N. Bruzelius, and W. Rothengatter. 2003. *Megaprojects and Risk: An Anatomy of Ambition*. New York, NY: Cambridge University Press. ; and Flyvbjerg, B., M. Garbuio, and D. Lovallo. 2009. “Delusion and Deception in Large Infrastructure Projects: Two Models for Explaining and Preventing Executive Disaster.” *California Management Review* 51(2): 170-193. Winter. <https://ora.ox.ac.uk/objects/uuid:3aa12b48-3281-412b-904a-cb5bbd9dca8e>.

²⁶ See Conner Everts, “Delta Tunnel Planners Should learn from Seattle’s Expensive Goof,” KCET, November 2, 2016. Accessible at <https://www.kcet.org/redefine/delta-tunnel-planners-should-learn-from-seattles-expensive-goof>.

damages?²⁷ How will a member agency balance its fiscal, financial, and water or land use responsibilities if it has fiduciary obligations to the JPA?²⁸ For example, if a water district as part of a JPA also faces revenue shortfalls in its individual budget from its customers conserving water, yet its JPA requires a minimum payment for debt service or other financial contribution, what should that district do? To whom does it owe primary responsibility?

Their pitfalls can extend to whether the JPA conducts its business in public as well as to conflicts of interest of its member officials under state law.²⁹ Add a private sector partner to the mix and any number of challenges can arise in P3s.³⁰

If MWD does not participate in WaterFix, it can spare future Boards, staff, and its customers the pain, expense, controversy, and heartache of joining a JPA and a P3 to fund, design, construct, and try to operate an exceptionally risky tunnels project—California WaterFix.

One person’s flexibility for “dual conveyance” and north versus south Delta diversions is another person’s redirected impacts.

Redirected impacts occur when a new action shifts impacts from one location or population elsewhere already affected by the existing project operations. WaterFix supporters DWR, the Bureau, and MWD claim that the project allows flexible pumping operations in a “dynamic fishery environment,” while complying with salinity and flow criteria required by the State Water Board.

“Flexible operations” redirects new impacts of the state and federal projects to the north Delta that would not have previously existed. Four million people live in the Delta region, and levee upgrades will still be necessary to protect this dual approach to exports, a facet of the project DWR and the Bureau prefer not to acknowledge after 11 years of planning.

²⁷ League of California Cities. n.d. *Joint Powers Authorities: Opportunities & Challenges*. Prepared by Joan L. Cassman and Jean B. Savaree. www.cacities.org/getattachment/5768b027-71a7-4bc5.../LR-Cassman,-Savaree.aspx. Gives practical legal tips for organizing JPAs, and highlights common pitfalls for those considering JPAs, from financing to legal to public access issues.

²⁸ *Ibid.*, p. 12.

²⁹ *Ibid.*, p. 15, 18-22.

³⁰ Sabol, P. and R. Puentes. 2014. *Private Capital, Public Good: Drivers of Successful Infrastructure Public-Private Partnerships*. Brookings Metropolitan Infrastructure Initiative. <https://www.brookings.edu/research/private-capital-public-good-drivers-of-successful-infrastructure-public-private-partnerships/>. Provides a breezy critique of P3s and why they were in vogue in 2014; and Stitt, C. 2017. *Infrastructure Spending and Public-Private Partnerships*. Hudson Institute. <https://www.hudson.org/research/13407-infrastructure-spending-and-public-private-partnerships>.

The WaterFix's own modeling reveals that average monthly Sacramento River flows into and through the Delta will decrease 20 percent—and there will be no month spared from significant flow decreases.³¹ The loss of these flows through the Delta mean more tidal salts will intrude into the Delta, degrading Delta irrigation supplies which in turn will affect crop choices, productivity, and farm revenues and jobs.³² The loss of these flows will also affect fish migration corridors, habitat, and behavior, which in turn will affect recreational, subsistence, and sport-fishing beneficial uses by Delta visitors and residents.

The egregious flow depletions WaterFix would cause were the reason that Contra Costa Water District (CCWD, which serves eastern and central Contra Costa County cities and towns) entered into and successfully executed a settlement with DWR to secure mitigations of water quality impacts for its diversions and water system from WaterFix. Before settling, CCWD had drafted some of the most damning water quality related comments against the project of any submitted on the project's environmental documents.³³

Impacts on northern California urban water agencies are at stake from reverse flows due to WaterFix. Its north Delta diversions will *increase* reverse flow events (that is, times when the Sacramento River will flow upstream, not downstream) in the north Delta. This means that sometimes flows get low enough already along the Sacramento River in the north Delta to flow backwards at high tide, and operation of the WaterFix's north Delta diversions will increase frequency of those events. East Bay MUD has testified persistently before the State Water Board that the WaterFix's increased reverse flow events would result in legal injury to their use of the legally prior Freeport diversion upstream of WaterFix intake sites. Does MWD want a share of such WaterFix litigation costs that would result?

DWR, the Bureau, and MWD management overstate the positive effects of WaterFix and its "flexible approach" on the Delta as a regional economy, regional ecosystem, a

³¹ Bay Delta Conservation Plan/California WaterFix RDEIR/SDEIS, Appendix B, pp. B-355 to B-356, Table B.7-27; and pp. B-359 to B-360, Table B.7-29. Data summarized and charted in Restore the Delta Exhibits RTD-149 and RTD-150 to the WaterFix Change Petition Hearing before the State Water Resources Control Board. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_149.pdf and http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_150.pdf.

³² Testimony of Michael Machado for Restore the Delta, December 8, 2016, before the State Water Resources Control Board in the WaterFix Change Petition Hearing, RTD-30. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_30_erratum.pdf.

³³ CCWD's settlement agreement with DWR is found at <http://ccwater.com/DocumentCenter/View/1851>. Their comment letters on environmental documents from 2014 and 2015 are found under "archived documents" at <http://ccwater.com/317/Bay-Delta-Conservation-Plan-Comments>.

source of supply for regional water customers in the Bay and Delta regions, and as a unique cultural, agricultural, recreational, and historical place.

MWD management and DWR claim that California WaterFix is sized to protect the Delta environment. Only increased fresh flows, water quality protection, and restoration actions will protect the Delta environment and economy. WaterFix is sized to benefit south of Delta water contractors and have redundancy for times when one tunnel is removed from service for maintenance. The suppressed 2015 Brattle Group cost study stated that taxpayer subsidies would be needed to fund agribusiness participation in the Tunnels. This has been confirmed by Westlands' farmers' reaction to the July 17 Goldman Sachs presentation.³⁴ Silicon Valley and urban southern California will wind up subsidizing Stewart Resnick's almond and pistachio empire and the Westlands Water District. In normal water years, agribusiness uses 70% of Delta exported water. Creation of a Joint Powers Authority lends a hand to a President Trump-endorsed public-private partnership (P3) that will ultimately commodify water to benefit corporate interests south of the Delta.

California WaterFix claims to avoid impacts to Delta communities. Tunnels construction would take 14 years, with major disruptions to Delta river channels, levee roads and traffic, air quality, farm economies, and community life. (Greenhouse gas emissions will be equivalent to 600,000 new cars on Delta roads; purchasing carbon sequestration credits elsewhere will not relieve direct pollution for Delta residents, which would become a sacrifice area.) The new intakes would add new places in Delta channels where fish would be injured and killed by fish screens and predators, would further export food supplies from starving, endangered fish, and would reduce water supplies for farms, causing job losses.

Please also see Attachment 2 of this letter for more on potential impacts of California WaterFix to Delta environmental justice communities.

³⁴ Dale Kasler, "These farmers say they may not pay for tunnels pushed by Gov. Brown," Sacramento Bee, July 17, 2017, accessible at <http://www.sacbee.com/news/state/california/water-and-drought/article161881208.html>.

Attachment 2
IMPACTS OF CALIFORNIA WATERFIX
ON BAY-DELTA ENVIRONMENTAL JUSTICE COMMUNITIES
AND THEIR DRINKING WATER SUPPLIES

Environmental justice—the potential for public decisions to avoid or mitigate disproportionate or discriminatory environmental impacts (including water-related impacts) to minority and low-income people and populations—is a solemn and vital consideration in the deliberations of state and federal agencies. They must simultaneously consider environmental justice concerns in the framework of the public interest, “the greatest public benefits,” and protection of public trust resources.

Environmental justice law and policy require consideration by state and federal agencies of whether environmental justice (EJ) communities bear disproportionate environmental impacts and risks from new developments or policies. EJ communities are defined along three lines: race and ethnicity, poverty level, and degree of language isolation, all characteristics that are measurable from U.S. Census and American Community Survey data.

In the five-county region of the Bay-Delta Estuary:

- The most significant non-white populations occur in the cities of Antioch, Pittsburg, Fairfield, Suisun City, Lathrop, Sacramento, and Stockton. Within the Delta, several smaller communities are also home to significant non-white populations: Freeport, Hood, Courtland, and Isleton—all of which would experience direct construction or operational impacts from the California WaterFix.
- The Delta is called home by high concentrations of low-income and impoverished residents. Significant numbers of individuals and families with incomes below the 2014 poverty line reside in Antioch, Pittsburg, Clarksburg, Stockton, Sacramento, and West Sacramento.
- Significant concentrations of language-isolated residents reside in Antioch, Pittsburg, Lathrop, Fairfield, Tracy, Stockton, Sacramento, and West Sacramento.
- Delta region residents of color and low-income residents, including those facing language barriers, live in quantifiably distressed areas.

- San Joaquin County, making up 40 percent of Delta region geography, has the highest level of economic distress among Delta counties.³⁵ 43 percent of the county's population lives in distressed zip codes. Stockton ranked sixth nationally and first among large California cities over 100,000 population where 70 percent of its residents face economically distressed conditions.
- Sacramento, Antioch, and Pittsburg also are sites of significant economic distress in the Delta region.
- Economic distress manifests in the spread of food deserts in the Delta region. US Department of Agricultural Economic Research Service mapping data reveal that Stockton, Manteca, Lodi, Pittsburg, Antioch, Suisun City, Fairfield, Vacaville, Davis and south Sacramento have numerous low-income census tracts whose residents face low access to grocery stores and healthful fresh food. 54 percent of the five Delta counties' census tracts are low income and have low access to grocery stores serving healthful fresh food.
- Bay-Delta environmental justice community members cope with poverty partly through subsistence fishing to obtain dietary protein. Restore the Delta estimated that annually as many as 65 to 110 people may engage in subsistence fishing daily from licensing and creel survey data—in the tens of thousands annually.

California WaterFix will harm Stockton's Delta drinking water supply and in turn the city's Environmental Justice communities.

³⁵ A recent study uses a "Distressed Communities Index" (DCI) that combines indicators of educational attainment (i.e., no high school degree), housing vacancy rate, adults not working, poverty rate, median income ratio (i.e., the ratio of community median income to that of the state), and changes in employment and business establishments between 2010 and 2013. Economic Innovations Group, The 2016 Distressed Communities Index: An Analysis of Community Well-Being Across the United States, p. 5. Accessible at <http://eig.org/wp-content/uploads/2016/02/2016-Distressed-Communities-Index-Report.pdf>. The DCI draws from seven indices of social and economic conditions using currently available data from the American Community Survey of the United States Census Bureau and other government data. They were chosen, according to this study, because:

Distress manifests itself in a lack of residential investment, in shuttering businesses, and in disappearing job opportunities; prosperity the inverse. A high school diploma is the entry-level ticket to opportunity in the economy, and they remain scarce in many struggling neighborhoods.

Low rates of adult employment identify communities where connections to the labor market have frayed; prospering communities, on the other hand, draw people back into the labor market with job opportunities. Poverty rates differentiate well-off from struggling communities too. And neighborhood median income relative to state median income sizes [i.e., measures] earnings differentials while controlling for differences in cost of living across the country.

...The DCI does not surmount...inherent challenges [of the indicators used], but the index approach does mitigate their individual biases.

The City of Stockton is a majority minority city, and is the largest city closest to the legal Delta. The city and its environmental justice communities faces an array of threats to its fresh water supply and water quality. This attachment summarizes these threats, and the City of Stockton's efforts to address them.

The City of Stockton draws water from the Delta for domestic and municipal use. The City of Stockton obtained water right permit 21176 (Application 30531A) from the State Water Resources Control Board on December 20, 2005, to divert a flow not to exceed 317 cubic feet per second and 33,600 acre-feet per year from the San Joaquin River at the southwest tip of Empire Tract.³⁶ This permit required the City to complete its point of diversion, raw water and treated water transmission pipelines, and its 30 million-gallon-per-day (MGD) water treatment facility by December 31, 2015. Permit 21176 requires the City to complete application of water to its authorized uses by December 31, 2020.

The City of Stockton is concerned about the future reliability of water quality at its DWSP intake and potential water treatment cost increases if California WaterFix facilities are constructed and operated. The City of Stockton alleges that DWR and the Bureau have failed to use data collected near the City's Delta Water Supply Project (DWSP) for impact analysis of potential harm.³⁷ Instead, Petitioners relied on a DWR monitoring station at Buckley Cove, nearly 10 miles southeast of the City's DWSP diversion point. The City stated that "Buckley Cove cannot be considered representative of the water quality available at the City's intake."³⁸

With enough time, whatever land saline water touches can turn salty, unless there is enough water to leach out salts.³⁹ Uses of water in the Delta depend largely on the quality of water available, but if quality degrades it may become unusable.⁴⁰ About one-quarter of Stockton's urban water supplies will rely on groundwater, a source that is

³⁶ Stockton Retail Water Sources, 2015, accessible at the end of Attachment 5 and at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_225.pdf.

³⁷ City of Stockton, 2014 Bay Delta Conservation Plan comments, pp. 38-43.

³⁸ *Ibid.*, p. 38, 39.

³⁹ Thomas H. Means, Salt Water Problem, San Francisco Bay and Delta of Sacramento and San Joaquin Rivers, April 1928, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_213.pdf, and California Department of Water Resources, Quantity and Quality of Waters Applied to and Drained from the Delta Lowlands, Report No. 4, July 1956, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_148.pdf.

⁴⁰ W. Turrentine Jackson and Alan M. Paterson, The Sacramento-San Joaquin Delta: The Evolution and Implementation of Water Policy, an Historical Perspective, California Water Resources Center, Contribution No. 163, June 1977, http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_215.pdf.

connected to Delta surface water percolation.⁴¹ The region is at risk of salinity incursion regionally from the west due to increased salinization of Delta channels.⁴²

Delta agriculture continues as the region's economic base, and irrigation water quality is the foundation for the sustainability of that future growth. California WaterFix threatens beneficial uses of water by environmental justice communities in the Delta region, particularly in the Stockton area where the largest and most distressed environmental justice communities are found.

Delta environmental justice communities are isolated from more mainstream levels of prosperity by language barriers, low educational attainment rates, and lack of economic opportunity. Since environmental justice communities are closely linked to issues raised by California WaterFix like drinking water quality; agricultural, land use, and socioeconomic issues; and fish contamination issues, their residents are made more vulnerable by the disproportionately distressed conditions in which they live. Water quality impacts from construction and operation of California WaterFix would be environmental blunt trauma to a region on the threshold of recovery and sustainable prosperity, if water quality in the Delta and underground water sources can be improved.

Operation of California WaterFix Facilities would degrade water quality in Delta channels, which would in turn degrade raw water diversions and, via deep percolation, the eastern San Joaquin County groundwater basin, both of which serve as sources of drinking water for Stockton metropolitan area residents.

The City informed the State Water Resources Control Board in January 2016 that it sought to develop the DWSP to protect regional groundwater from increasing overdraft and to reduce its draw on groundwater because of that source's higher TDS content.⁴³ The City stated:

Groundwater levels improved over the past few decades in the Stockton vicinity, but if groundwater must be relied upon more extensively as a result of the proposed action, groundwater levels will be expected to decline, and TDS levels in potable supplies and wastewater discharges will increase. Indirect

⁴¹ Stockton Retail Water Sources, 2015, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_225.pdf; and Projected Water Supplies for Stockton, 2020 to 2040, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_226.pdf.

⁴² Northeastern San Joaquin County Groundwater Banking Authority, Eastern San Joaquin Groundwater Basin, Groundwater Management Plan, 2004, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_146.pdf; and San Joaquin County Flood Control and Water Conservation District, Water Management Plan, Phase 1 - Planning Analysis and Strategy, October 2001, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_147.pdf.

⁴³ City of Stockton, Protest of California WaterFix Change Petition, January 5, 2016, p. 2.

groundwater-related effects of this nature would be inconsistent with the Sustainable Groundwater Management Act or its goals.⁴⁴

The City's DWSP was developed under a California Water Code section that provides that a municipality discharging water into the San Joaquin River "may file an application for a permit to appropriate an equal amount of water, less diminution by seepage, evaporation, transpiration or other natural causes between the point of discharge and the point of recovery, downstream from said disposal plant and out of the San Joaquin River or the Sacramento-San Joaquin Delta." (Cal. Water Code § 1485.) The DWSP now appropriates Delta water supplies to serve some 47,000 residential, commercial, and industrial customers with an estimated service population of 170,000 people in the City's service area.⁴⁵ The City expressed grave concerns that DWR and the Bureau have ignored City water rights, quality, and supply, as these would be affected by California WaterFix during the BDCP environmental review process in 2013-2014 as well as the California WaterFix environmental review process during 2015.⁴⁶

Petition Facilities' potential to degrade water quality would affect subsistence fish consumption by environmental justice communities in the Delta region, should the frequency of environmental conditions that foster toxic algal blooms increase.

DWR and the Bureau acknowledge occurrence of subsistence fishing and risks of adverse effects to people consuming fish caught from Delta channels in the period when California WaterFix operates. There has never been a census of Delta subsistence anglers, despite the potential health risks of catching and consuming fish routinely from Delta channels. Using publicly available data from the California Department of Fish and Wildlife (DFW), Restore the Delta estimates through two distinct methodologies that there are, on any given day, between 66 and 110 licensed subsistence anglers from distressed communities fishing Delta water ways.⁴⁷ Our methodologies rely on both an angling hours survey and county-level fishing license data from DFW. Assumptions are spelled out in our exhibits accepted into evidence by the State Water Board detailing how we arrived at our estimates.⁴⁸ Our methods conservatively assume that each angler fishes just once a year, which probably

⁴⁴ *Ibid.*, Attachment 2, p. 2, and Attachment 4, p. 1.

⁴⁵ City of Stockton, 2014 Bay Delta Conservation Plan Comments, p. 1.

⁴⁶ *Ibid.*; City of Stockton, 2015 California WaterFix RDEIR comments.

⁴⁷ Methodology for Estimating Population of Delta Region Subsistence Anglers from Fishing License Data, p. 2, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_229.pdf; and Methodology for Estimating Delta Counties Subsistence Anglers from Angling Intensity (Hours) Data, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_230.pdf.

⁴⁸ *Ibid.*

underestimates total subsistence fishing activity in the Delta. Despite this limitation of our methods, we estimate between 24,000 to 40,000 subsistence fishing visits annually in the Delta from local residents of distressed communities. We offer no estimate of the mass of fish nor the number of persons actually consuming those fish.

Delta region subsistence anglers have been found to fish along both the Sacramento and San Joaquin Rivers, despite the latter being an impaired water body for a number of contaminants.⁴⁹ Delta region subsistence anglers are known to catch and consume a variety of native and introduced fish species, including American shad, bluegill, carp, catfish, crappie, Chinook salmon, largemouth bass, pike minnow, Sacramento split tail, Sacramento sucker, steelhead/rainbow trout, striped bass, sturgeon, and sunfish.⁵⁰

Many fish caught and consumed by subsistence anglers consume prey from the bottom of river channels where contaminants can accumulate. Other fish consumed by subsistence anglers feed on prey consumed in open water or other parts of river channels. In the course of consuming prey, these species may also consume contaminants such as mercury, pesticides, selenium, and other chemicals that accumulate in prey tissues and that are regulated via Total Mean Daily Loads adopted by the State Water Board and Central Valley Regional Water Quality Control Board. Consequently, environmental justice communities are at risk of heightened exposure to health risks associated with consuming fish caught through subsistence angling in the Delta.⁵¹

In addition, such fish may be vulnerable to disease and death from exposure to toxins released by harmful algal blooms, such as microcystin, a hepatotoxin (toxic to liver tissue and skin) produced by *Microcystis*, a common cyanobacterium found in the Delta

⁴⁹ F. Shilling, et al, 2010. Contaminated fish consumption in California's Central Valley Delta. *Environmental Research* 110(2010): 335, Figure 1, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_231.pdf.

⁵⁰ *Ibid.*, p. 336 Table 1; J.A. Davis, et al., 2008. Mercury in sport fish from the Sacramento-San Joaquin Delta region, California, USA. *Science of the Total Environment*, 391: 69, Table 2, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_232.pdf.

⁵¹ Shilling, et al, 2010; Davis, et al, 2008; E. Silver, et al, 2007. Fish consumption and advisory awareness among low-income women in Sacramento-San Joaquin Delta, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_235.pdf.

since 1999.⁵² Key factors believed by scientists to drive algal blooms that cause harm in open water ways include water temperature, sunlight irradiating water, water clarity, a stratified water column coupled with long residence times of water; availability of nitrogen and phosphorus, and salinity.⁵³

Two of these factors would be directly affected by operation of Petition Facilities: residence time of water and salinity. Increased residence time of water decreases the loss rate of cyanobacteria from a water body.⁵⁴ Increased residence time of water also influences inversely the stratification of the water column; the slacker the flow of water the more the upper levels of a water column can warm to an optimal growth temperature range for *Microcystis*, between 25 and 35 degrees Centigrade (77 to 95 degrees Fahrenheit).⁵⁵ Such conditions may occur mainly in late summer months, but climate change effects may shorten California's winter wet season and contribute to extending the season during which harmful algal blooms may occur.⁵⁶

Operation of California WaterFix would also increase residence time of water in the Delta. When such increased residence time is combined with reduced flows and increased salinity, also caused by California WaterFix, the period of time could increase during which environmental conditions favor algal blooms.

The environmental justice effects of increased harmful algal blooms would include increased contamination of fish populations locally from microcystin uptake and accumulation and increased risk of illness and death for environmental justice community members and pet dogs they may take with them fishing, due to contact with water while engaged in subsistence fishing. These effects would be borne disproportionately by racial and ethnic minorities, people in poverty, and people challenged by language barriers. These disproportionate effects would accumulate with the economic distress already prevalent in their communities and would undermine long-term growth in jobs, economic output, and sustainable economic development in the Stockton region.

⁵² Berg, M. and M. Sutula, 2015. Factors affecting the growth of cyanobacteria with special emphasis on the Sacramento-San Joaquin Delta, Southern California Coastal Water Research Project Technical Report 869, August 2015, p. 4, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_236.pdf; and P.W. Lehman, et al, 2013. Long-term trends and causal factors associated with *Microcystis* abundance and toxicity in San Francisco Estuary and implications for climate change impacts. *Hydrobiologia* 718: 142, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_237.pdf.

⁵³ Berg and Sutula, *ibid.*, p. ii, and pp. 21-33.

⁵⁴ *Ibid.*, p. 33.

⁵⁵ *Ibid.*, p. 31, 33.

⁵⁶ *Ibid.*, p. iii, 32, 48, 51.

Water quality effects of California WaterFix include effects on groundwater supplies for municipal beneficial uses.

Such water quality effects in Delta channels would affect groundwater, since surface and groundwater supplies in the Delta are connected. The Delta area has a large pumpage depression or “cone of depression” that causes an influx of water from the Delta to percolate to underground water supplies.⁵⁷ United States Geological Survey groundwater modeling estimates that Delta surface channels lose between 100 to over 500 acre-feet per year to groundwater percolation.⁵⁸ Surface water was also found to recharge groundwater from Calaveras and Stanislaus rivers and Dry Creek. On average there was a net lateral inflow to the groundwater system of 120,000 acre-feet between 1970 and 1993 (an estimated annual average of about 5,000 acre-feet per year).⁵⁹ Generally, groundwater pumping rates in San Joaquin County in 2004 were found to exceed the sustainable yield of the groundwater basin, estimated to be approximately 150,000 to 160,000 acre-feet.⁶⁰ The eastern San Joaquin groundwater basin management plan assumed that “all basin inflow in west Stockton is saline” because “accretions in the western fringes of the Basin and the Lower San Joaquin River are undesirable due to elevated salinity levels. Saline groundwater intrusion has forced the closure of several wells in the Calwater service area.”⁶¹ The City of Stockton’s domestic water supply permit from the State Water Resources Control Board shows that Stockton has nine inactive wells and has destroyed another 17 wells.⁶² Increased west-to-east flow is considered by San Joaquin County’s groundwater basin management plan is “undesirable,” as this water is typically higher in TDS and chloride levels and causes degradation of water quality in the Basin.⁶³ The plan further states:

Degradation of water quality due to TDS or chloride contamination threatens the long-term sustainability of a very important water resource for San Joaquin

⁵⁷ Faunt, C.C., ed., 2009, Groundwater Availability of the Central Valley Aquifer, California: U.S. Geological Survey Professional Paper 1766, p. 167, column 2, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_145.pdf.

⁵⁸ *Ibid.*, pp. 171-172, Figure C19.

⁵⁹ Northeastern San Joaquin County Groundwater Banking Authority, Eastern San Joaquin Groundwater Basin, Groundwater Management Plan, 2004, p. 69, Section 2.3.4.4. Accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_146.pdf.

⁶⁰ *Ibid.*, p. 69, Section 2.3.6.

⁶¹ *Ibid.*

⁶² State Water Resources Control Board, Transmittal of Water Supply Permit to City of Stockton, *op. cit.*, pp. 13-14.

⁶³ Northeastern San Joaquin County Groundwater Banking Authority, Eastern San Joaquin Groundwater Basin, *op. cit.*, p. 71, Section 2.3.7.

County, since water high in TDS and/or chloride is unusable or either urban drinking water needs or for irrigating crops. Damage to the aquifer system could for all practical purposes be irreversible due to saline water intrusion, withdrawal of groundwater from storage, and potential subsidence and aquifer consolidation.⁶⁴

The saline front of groundwater intrusion beneath south and downtown Stockton is projected to move another 1.5 miles east by 2030, just as future urban water demand was expected to see a net increase among the cities of San Joaquin County of 146,600 acre-feet per year.⁶⁵

Summary of Water Quality Degradation for Delta Environmental Justice communities.

Increased groundwater percolation from Delta channels containing surface water that is made more saline by operation of California WaterFix facilities would increase the risk that poorer DWSP water quality would force Stockton and its other urban water supplier, California Water Service Company, to rely more on groundwater sources to supply their customers.

There are many legal users of water in the north Delta, where major agricultural crops include pears, vineyards, and other permanent deciduous crops which depend on good quality fresh water supplies. Removal of 20 percent or more of the fresh water in this region of the agricultural Delta will reduce fresh water supplies to farmers and cause injury to their water rights and crop productivity when salts build up in soil horizons, which must be leached out.⁶⁶ Available salinity modeling from the RDEIR/SDEIS indicates that central Delta locations will see increased salinity conditions as an effect of construction and operation of Petition facilities. Increased salinity conditions in affected parts of the Delta will mean agricultural uses will be injured by having either to accept lower crop yields or shift to more salt-tolerant crops, or both.

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*, p. 74, Figure 2-27, p. 75, Table 2-4; San Joaquin County Flood Control and Water Conservation District, Water Management Plan, Phase 1 - Planning Analysis and Strategy, October 2001, pp. 2-15 to 2-16, Figures 2-8 and 2-9, and p. 2-18, Table 2-3, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_147.pdf.

⁶⁶ California Department of Water Resources, Quantity and Quality of Waters Applied to and Drained from the Delta Lowlands, Report No. 4, July 1956, accessible at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/RestoretheDelta/RTD_148.pdf.

Attachment 3

Alternative Water Supply and Efficiency Cost Comparisons for California

Any cost comparison must start with a description of the Metropolitan Water District's existing water rates. From its web site these rates are as follows:

Metropolitan Water District Water Rates, FY 2016-2017 and Proposed CY 2017-2018 Rates and Charges (\$/Acre-foot, except where noted)			
Effective January 1st	2016	2017	2018
Tier 1 Supply Rate	\$156	\$201	\$209
Tier 2 Supply Rate	\$290	\$295	\$295
System Access Rate	\$259	\$289	\$299
Water Stewardship Rate	\$41	\$52	\$55
System Power Rate	\$138	\$124	\$132
Full Service Untreated Volumetric Cost			
Tier 1	\$594	\$666	\$695
Tier 2	\$728	\$760	\$781
Treatment Surcharge	\$348	\$313	\$320
Full Service Treated Volumetric Cost			
Tier 1	\$942	\$979	\$1,015
Tier 2	\$1,076	\$1,073	\$1,101
Readiness-to-Serve Charge (\$M)	\$153	\$135	\$140
Capacity Charge (\$/cfs)	\$10,900	\$8,000	\$8,700
Source:	Metropolitan Water District Water Rates and Charges accessible at http://mwdh2o.com/WhoWeAre/Management/Financial-Information/Pages/default.aspx#tab2 . Definitions of terms are found at that page.		

Cost per acre-foot comparisons for California WaterFix have varied widely, depending upon who is performing the analysis. The Brattle Group's 2015 Draft Study of WaterFix stated that, "Looking across the SWP urban agencies considered, the value to ratepayers of the water *preserved* by the WaterFix is \$1,414 per acre-foot. These values are at the low end of the range of water supply alternative costs, which is

understandable since the water supplies preserved by the WaterFix vary considerably between wet and dry years, where has alternatives such as recycling and desalination are more reliable.”⁶⁷ This cost appears to be for untreated water conveyed under the Delta, and may not contain the SWP transportation costs (including lifting from Edmonton Pumping Plant over the Tehachapi Range; system access rate, water stewardship rate, and system power rate; ***Restore the Delta recommends that MWD Directors ask staff what the WaterFix cost estimate includes.*** MWD decision makers should bear in mind that the cost allocated to agricultural users of WaterFix supplies (and how and whether they are subsidized and by whom) will affect the \$1,414 per acre-foot figure quoted above—again, there is risk involved in who and how many water agencies decide to participate in WaterFix.

In 2016, the Pacific Institute produced a report for urban water supply and efficiency alternatives. The following table provides a summary of their cost comparisons.

Pacific Institute Survey of Alternative Water Supply and Efficiency Alternatives, 2016			
Water Supply Source	Total Cost (\$ per AF)		
	Low	Median	High
Stormwater capture - small	\$930	\$1,500	\$1,600
Stormwater capture - large	\$570	\$590	\$600
Recycled water - non-potable	\$1,500	\$1,500	\$2,100
Recycled water - indirect potable reuse small	\$2,000	\$2,300	\$2,700
Recycled water - indirect potable reuse large	\$1,600	\$1,800	\$2,000
Desalination brackish small	\$1,000	\$1,600	\$1,800
Desalination brackish large	\$950	\$1,100	\$1,300
Desalination seawater small	\$2,700	\$2,800	\$4,300
Desalination seawater large	\$2,100	\$2,100	\$2,500
Residential Efficiency Options			
Toilet - 3.5 to 1.28 gpf	-\$630	NA	-\$190
Toilet - 1.6 to 1.28 gpf	\$1,200	NA	\$4,600
Showerhead	-\$3,000	NA	-\$2,800

⁶⁷ The Brattle Group, Draft CalWater Fix Economic Analysis, prepared for California Natural Resources Agency by David Sunding, November 15, 2015, p. 13. Emphasis added. Accessible at <http://www.restorethedelta.org/wp-content/uploads/2016/09/CA-WaterFix-Economic-Analysis-Sunding.pdf>.

Pacific Institute Survey of Alternative Water Supply and Efficiency Alternatives, 2016			
Water Supply Source	Total Cost (\$ per AF)		
	Low	Median	High
Clothes washer	-\$760	NA	-\$190
Dishwasher	\$12,000	NA	\$19,000
Landscape conversion at \$2/square foot (SF)	-\$4,500	NA	-\$2,600
Landscape conversion at \$5/SF	\$580	NA	\$1,400
Non-residential Efficiency			
Toilet - 3.5 to 1.28 gpf	-\$680	NA	-\$70
Toilet - 1.6 to 1.28 gpf	\$1,800	NA	\$6,500
Urinal	\$970	NA	\$1,800
Showerhead	-\$3,000	NA	-\$2,800
Faucet aerators	-\$1,200	NA	-\$700
Pre-rinse spray valve	-\$1,700	NA	-\$1,200
Medical steam sterilizer modifications	-\$1,300	NA	-\$1,200
Food steamer	-\$14,000	NA	-\$13,000
Ice machine	-\$3,600	NA	-\$1,100
Clothes washer	-\$1,600	NA	-\$1,100
Source:	Pacific Institute, <i>The Cost of Alternative Water Supply and Efficiency Options in California</i> , prepared by Heather Cooley and Rapichan Phurisamban, October 2016, Tables 1, 2, 4, 5 and 6.		

There are many cost-effective options compared with committing to finance California WaterFix. We urge MWD Board members to give serious consideration to the opportunity cost of investing in a variety of these options as compared with committing the District's own credit worthiness and property tax base on behalf of a very risky conveyance project that would damage the Delta estuary and its regional economy.

WaterFix agricultural water rates are unknown, as is whether predominantly agricultural water agencies (such as Kern County Water Agency and Westlands Water District, and other smaller such agencies) will participate in WaterFix. Without Congressional action to subsidize WaterFix participation (and none is expected), CVP contractors opting in would likely pay a full marginal cost typical of SWP agricultural contractors.

Attachment 4

California Water Solutions

THE PROBLEM:

1. OUR INFRASTRUCTURE IS FAILING.
2. CLIMATE SCIENTISTS TELL US THAT EXTREME DROUGHTS AND FLOODS ARE THE NEW NORMAL FOR CALIFORNIA.
3. THE SAN FRANCISCO BAY-DELTA ESTUARY IS COLLAPSING AND THE WEST COAST'S HISTORIC FISH SPECIES AND INDUSTRIES ARE HEADED TOWARD EXTINCTION DUE TO EXCESSIVE WATER EXPORTS FROM THE DELTA.

THE SOLUTION: We can address these problems by not building the \$17 billion Delta Tunnels and redirecting those funds to dozens of local projects that create local/regional self-sufficiency and good permanent jobs.

The California Natural Resources Agency created a California Water Action Plan that has many good, noncontroversial projects in it, but neither the Agency nor Governor Brown prioritize:

- needed flood control projects which can help restore groundwater basins and improve supplies.
- a multitude of small projects needed in California to improve and augment regional self-sufficiency.
- the 678 dams in need of repair to sustain our present water supply.
- upgrading water mains to eliminate leaks and increase our urban water supply by 15 percent.
- floodplain restoration to protect the lives and property of present and future Californians.

When asked about alternatives to the Delta Tunnels in 2015, Governor Jerry Brown said, "I don't think there is a Plan B."

THEN CAME OROVILLE DAM. Nearly 200,000 Californians displaced for two days wondered if they would have homes and communities to go back to in the Sacramento Valley if Oroville spillway and dam failed. The crisis was a warning to all of us in California: Our existing water infrastructure has fallen into a dangerous state of disrepair.

THERE IS A PLAN B: THE CALIFORNIA SUSTAINABLE WATER PLAN

JOBS: Developing regional self-reliance is the best way to provide a more reliable water supply. This requires investment in water conservation, maximizing wastewater re-use and groundwater recharge, while capturing storm water and rainwater, gray water, and fixing leaky local pipes. Cleaning up polluted aquifers and providing jobs for local water makes good economic sense. Southern California labor units have expressed interest in mass deployment of gray water systems; workers are ready for these investments.

RE-USE AND RECYCLING: Two-thirds of the reuse potential is in coastal areas where wastewater is discharged into the Pacific Ocean or into streams draining to the ocean.

CONSERVATION AND EFFICIENCY: "Make conservation a California way of life," said the California Water Action Plan in 2014. There are many, many strategies, large and small, to achieve this. Urban and agricultural water conservation, floodplain restoration, and toxic farmland retirement are all good starts.

STORMWATER CAPTURE: Stormwater runoff from impervious surfaces in urban and suburban areas can be captured to increase California's water supplies dramatically—WHEREVER RAIN FALLS.

FOR MORE INFORMATION: [The California Sustainable Water Plan 2017](#)