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[October 3, 2016]

California Water Commission
Submitted by email to: WSIPComments@cwc.ca.gov

California Water Commission
P.O. Box 924836
Sacramento, CA 94236

Re: Comments on the Water Storage Investment Program Quantification Regulations
Specific to the Incorporation of Climate Change

[Dear Chair Byrne and Water Commissioners,]

Thank you for the opportunity to comment on the draft Water Storage Investment Program (WSIP) Quantification Regulations. As you know, we have been actively engaged in your process, submitting comments on the draft regulations, attending public meetings and speaking directly with Department of Water Resources (DWR) staff. Despite these efforts, the way in which climate science is currently included in the regulations is insufficient to provide you, as Commissioners, with adequate information to evaluate the resiliency of projects. Furthermore, the approach taken to incorporating climate projections is at odds with a body of scientific research and peer-reviewed studies, the recommendations of DWR's own climate change technical advisory group (CCTAG), and existing law. As such, represents a dangerous precedent for other state planning processes and policies.

Make no mistake, this funding opportunity is a once-in-a-generation opportunity to build and improve California's water infrastructure so it may be resilient enough to withstand climate change impacts and continue to serve Californians for decades to come. Yet, in order to do so, the Commission needs information that reflects how well proposed projects will function in future conditions, particularly stressful conditions. Unfortunately, the approach to climate change fails to accomplish the central goal of providing adequate information to quantitatively evaluate the resiliency of projects to climate change.

There are three main technical problems in the current approach to climate change described in Section 6004(a): 1) arbitrary truncation of climate change projections, 2) the lack of a stress-test approach as recommended by DWR's Climate Change Technical Advisory Group, and 3) inadequate information to enable the Commissioners to quantitatively evaluate the resiliency of projects. In addition, this approach runs contrary to a series of statutes. We enumerate and describe these technical and legal problems in greater detail below.

Technical Problems

Arbitrary Truncation of Climate Change Projections

The WSIP Quantification Regulations arbitrarily truncate the analysis of climate impacts at 2085, cutting off over 15 years of data provided by climate models. It should be of particular concern that these 15 years are where the impacts of climate change are often the most pronounced. In addition, a recent, peer-reviewed study of climate impacts on the Sacramento and San Joaquin basins by the federal Bureau of Reclamation (BOR) uses all of the data provided by climate models, following the commonly-accepted best practice. There is insufficient explanation of why 15 years of climate change data were ignored in the revised regulations.

California has invested significant public funds in downscaling climate change projections out to the end of year 2099. We know of no scientifically-defensible reason to not use the entire time series of existing data. The current approach could lead the Commission to fund water storage projects that will not be able to deliver public benefits over the lifetime of the proposed project since the revised regulations truncate climate change impacts at 2085, while project lifetimes and project benefits may extend to 2120.

Lack of a "Stress-test" Approach as Recommended by DWR's Climate Change Technical Advisory Group

From 2012-2015, DWR convened a Climate Change Technical Advisory Group (CCTAG) that included a number of preeminent climate scientists. Together, DWR and the CCTAG published *Perspectives and Guidance for Climate Change Analysis* (2015), which recommended that water planning processes utilize a "stress test framework" to analyze the impact of future climate conditions on water resources: "A stress-test approach using scenarios of constructed extreme events along with analyses of vulnerability to these events, offers a vehicle to assess extremes in a planning process… Stress tests focus on identifying weaknesses and breaking points to the water system that stem from different facets of extreme events" (excerpted from *Perspectives and Guidance for Climate Change Analysis*, CCTAG 2015. Online at: http://www.water.ca.gov/climatechange/docs/2015/Perspectives_Guidance_Climate_Change_Analysis.pdf).

While everyone can agree that climate change will undoubtedly stress new water infrastructure, there is uncertainty about *how* the climate will change over the coming decades. The Intergovernmental Panel on Climate Change has made it clear that global climate models are not representative of the probability of different changes. In other words, the *average change* from all available models has *no relationship* to the true likelihood of future climate change. The appropriate use of climate models, therefore, is to estimate a plausible range of conditions that can then be used to stress test decisions.

Methods for decision-making under deep uncertainty (DMDU) have been developed to accommodate climate uncertainty and inform long-term planning. One such approach is robust decision making (RDM), which has been used by water utilities across the West including Metropolitan Water District, the Bureau of Reclamation in its award winning Colorado River Basin Study, and the World Bank. "Rather than assigning probabilities to these scenarios—a potentially contentious and controversial endeavor—RDM instead

analyzes the simulation results to identify those scenarios that lead to unacceptable outcomes…These conditions thus describe those scenarios that should be of concern to water managers and are thus most relevant for decisions about strategies" (excerpted from *Addressing Climate Change in Local Water Agency Plans: Demonstrating a Simplified Robust Decision Making Approach*, RAND Corporation 2013. Online at: http://www.rand.org/pubs/research_reports/RR491.html).

Stress testing using an approach such as robust decision making gives decision makers information that can help them understand when a project will fail to provide its stated benefits. This is why the World Bank has begun using RDM and other DMDU approaches to account for climate change in water and energy planning processes (see: *Enhancing the Climate Resilience of Africa's Infrastructure: The Power and Water Sectors*. World Bank 2015. Online at: http://documents.worldbank.org/curated/en/857671468179354431/Enhancing-the-climate-resilience-of-Africas-infrastructure-the-power-and-water-sectors; and *Robust decision-making in the water sector: a strategy for implementing Lima's long-term water resources master plan*, World Bank 2015. Online at http://documents.worldbank.org/curated/en/617161468187788705/Robust-decision-making-in-the-water-sector-a-strategy-for-implementing-Lima-s-long-term-water-resources-master-plan).

Utilizing a stress-test approach is common in many other sectors from designing building codes to protect people from "violent" seismic activity, not average seismic events, to nuclear safety. "Nuclear safety officials, for example, must consider worst-case scenarios and design reactors to prevent the kind of catastrophic impacts that would result. National security planners, public health officials, and financial regulators are likewise concerned with 'tail risks'. Most decision-makers will not make day-to-day decisions with these catastrophic risks in mind, but for those with little appetite for risk and high potential for damage, the potential for catastrophic outcomes is a data point they cannot afford to ignore" (excerpted from the *American Climate Prospectus* 2014. Online at: https://gspp.berkeley.edu/assets/uploads/research/pdf/American_Climate_Prospectus.pdf).

Unfortunately, the revised regulations do just the opposite of stress testing. Instead of testing projects against the full range of possible climate futures, the revised regulations average the climate models for each quantile, diluting the wettest and driest conditions (see pg. A-4 of the *Technical Reference Document*). In so doing, we lose valuable information about how a project would operate under more severe stress. It is in these stressed situations that projects are most likely to fail to provide public benefits, which is central to the Commission's decision making process about how to spend public funds.

In addition, the revised regulations rely on a series of climate models that are wetter, on average, than the climate change results used in most recent studies (WaterFix/BDCP Draft EIS/EIR, DWR 2013; and Sacramento-San Joaquin Basin Study, BOR 2015). Moreover, the revised regulations do not include the current and most severe drought on-record. Thus, the drought signal is even further diluted. This is a serious problem because when it comes to stress-testing storage projects, drought representation is key. There is a growing body of peer-reviewed science that indicates that: a) the current drought, while extreme, is not outside the range of natural variability; and b) climate change is likely to lead to longer and more severe droughts (Griffin and Anchukaitis 2014; Cook, Ault, and Smerdon 2015; Pagan et al. 2016).

Inadequate Information to Enable Commissioners to Quantitatively Evaluate the Resiliency of Proposed Projects

The bottom line is that the revised regulations incorporate climate science into the calculation of public benefits in a way that is likely to underestimate the impacts of more severe conditions on the provision of public benefits. The revised regulations actually admit this flaw, by including a separate section that is *not* used to calculate benefits, which asks applicants to *qualitatively* describe how sensitive projects are to more severe conditions (Section 6004 (a)(8)). This is inadequate to provide the Commission with the information necessary to *quantitatively* score how resilient a project is to the range of future climate conditions, as required in Section 6008.

The technical review (Section 6007) requires that the evaluation assess "The project's resiliency and non-monetized benefit." The scoring section then requires that this qualitative assessment be quantified as part of the scoring equation used to rank projects relative to one another (Section 6008). A key problem is that there is no requirement for applicants to provide any quantitative information assessing a project's resiliency to a larger range of potential climate futures. Thus, the Commission has inadequate information to quantitatively evaluate the resiliency of projects to more severe, or stressful, climate futures. Without this information, the Commission could fund water storage projects that will not be able to deliver public benefits in the future.

Legal Problems

WSIP Quantification Regulations inconsistent with Assembly Bill 1482

Assembly Bill 1482 added requirements for state agencies to plan for, and maximize, climate adaptation where applicable and feasible. (Assem. Bill No. 1482 (2015-2016 Reg. Sess.) § 2.) Pertinent to these regulations, drought resiliency related to climate change must be addressed. (Cal. Pub. Res. Code § 71154, subd. (e).)

Section 6004 (a) of these draft regulations ignores the mandates in AB 1482 by allowing the analysis of climate change and drought resiliency to stop at 2085 while project benefits continue to accrue as far into the future as the 2120s.

WSIP Quantification Regulations inconsistent with Executive Order B-30-15

Executive Order B-30-15, issued by Governor Brown, mandates that climate change be taken into account for planning and investment decisions. (Governor's Exec. Order No. B-30-15 (Apr. 29, 2015).) Again, Section 6004 (a) of these draft regulations is inconsistent with Executive Order B-30-15 by allowing for the analysis of climate change and drought resiliency to stop at 2085 while project benefits continue to accrue to 2120.

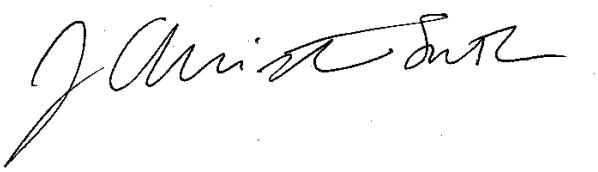
WSIP Quantification Regulations inconsistent with Water Code Section 79750 (b)

Finally, Water Code Section 79750 (b) appropriated money for the Water Storage Investment Program, but clearly stipulated that these funds could only support public benefits. While the draft regulations truncate the analysis of climate change impacts at 2085, multiple scientific studies find that climate impacts are likely to become more severe *at the end of the century*. By not requiring an analysis of climate change impacts past 2085, project proponents may significantly overstate public benefits that can be provided by the project. Thus, Section 6004

(a) of these draft regulations violates Water Code Section 79750 (b) by not ensuring that funds go toward public benefits that could be credibly realized over the lifetime of the project.

We ask that you revisit these regulations and make changes to Section 6004 (a) in order to comport with science, and ensure that expensive investments in infrastructure projects are designed to deliver real public benefits that will protect the economy, health and safety of current and future Californians. Please contact us if the Commission would like any additional information on the points included in this letter.

Sincerely,



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