The SHIBATANI GROUP, INC.

Water Supply Strategic Planning, Climate Change Hydrology, New Reservoir Development and Operations
Serving California, U.S. and International Water Industries

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DELIVERED BY REGULAR MAIL

Mr. Armando Quintero
Chairman
California Water Commission
P.O. Box 942836
Sacramento, California 94236-0001

Re: Response to Request for Comment – June 13, 2019
State Agencies Seek input on Creating Climate-Resilient Water System

Dear Mr. Chairman,

Thank you for this opportunity to provide input to the Commission to help the State develop its long-term strategy regarding water resources security. Hopefully, when completed, this will benefit all future California water users. The following is hereby submitted in response to your request:

Whenever agencies initiate an investigation on water resources, the proper first step is to establish a water balance. This provides investigators with quantitative evidence of the hydrological characteristics of the area in question; how much water comes in, how much goes out, how much is residual storage, etc. It provides investigators with a snapshot of the hydrological condition and status of the area under study. In California, this water budget is well known. And yet, the principles for which it stands, are often ignored in many applied projects and initiatives.

The State receives on average, about 200 million acre-feet[1] (MAF) of precipitation yearly; this of course is highly variable between years with amounts over 325 MAF or as low as 130 MAF not uncommon in wet and dry years, respectively. The actual "dedicated" yield, meaning that portion of rainfall actually allocated towards one of three beneficial use categories; M&I[2], Ag, and Environmental, is about 85 MAF (or 43% of total gross precipitation). Of the "dedicated yield", it is interesting to note that in a normal water year, environmental flows make up nearly one-half of all "managed" water in the State (in wet years, that percentage goes up to 63%). Clearly, California allocates a significant and more often than not, majority of its dedicated yield towards environmental purposes. The environment is the principal beneficiary in California water resources management. Claims that sprawling suburbs or farms are taking up all of California's water supplies are simply untrue. The environment has dedicated to it, almost 5x the amount allocated to urban uses in a normal water year (WY).

The immediate question then becomes, "*If so much water falls each year, where does it all go*?" The answer is twofold; the other almost 60% of gross precipitation ends up either as evaporated (E) or transpired water (ET) combined with stormflow runoff (RO). These losses are so significant that even in a

[1] Equivalent to about 326,000 gallons.
[2] Municipal and Industrial including residential water use

"normal" water year, the State loses almost 6 MAF – a notable net depletion from storage. This remarkable fact is largely unknown by the vast majority of persons in California including our elected leaders. Yes, we are losing water...in all but the wettest of years.

Given this hydrological backdrop what are the prudent options moving forward to ensure long-term water security? Hydrologically, there is only one option. Effective water resources management strives towards the efficient use of all water made available. That means, of the gross precipitation received in any given year, the ability to put as much of it to beneficial use before it is permanently lost (through E, ET, or RO) will determine one's efficiency and hence, water management skill.

We here in California have a bi-modal weather pattern, not uncommon among semi-arid Mediterranean climates; a relatively brief wet rainy (winter) season followed by many months of dry hot weather. From a water resources management perspective that means toggling back and forth between water supply acquisition and water evacuation for flood control. We're in a constant "*store or spill*" mode. Timing, therefore, becomes critical. Misjudge either, and significant consequences can accrue.

"California's weather "whiplash" makes timing essential to effective water operations"

Accepting that water supply and flood control serve opposite extremes of the water availability spectrum; it is nevertheless incumbent on water managers to integrate these two to the best extent possible. We call it closing the *water supply/flood control* "gap". Essentially, it involves moving towards a closed system where the inputs most closely match outputs. The goal is to put as much of the gross incident precipitation to beneficial use, thus minimizing wastage, accommodating flood control needs, and providing other beneficial users with enhanced water supplies for their use.

But is that amount water really available? Many in California believe that the hydrology is such that no excess water exists. Oh, how wrong that is! This remains one of the gravest misunderstandings in natural resource management, particularly in California where many have been led to believe that there is a natural water shortage. The data simply doesn't bear that out. There may be a shortage, but it certainly is not natural...plenty of rain falls every year...more than we need...we're just very bad at managing it.

"If a true drought existed, there would be no floods during the entire drought period; this clearly is not the case"

Just as an example; we tracked the daily reservoir operations of Folsom Reservoir over the course of this past winter/spring (January – May). We monitored reservoir inflow, outflow, releases through the power penstocks, lower river outlets, and "spills" as mandated by the USACE flood rule curve. Folsom Reservoir "spilled" over 913,000 AF from January through May. One reservoir, among the State's hundreds of controlled facilities spilled almost a million acre-feet in a 5-month period. To put that into perspective, that is equivalent to almost 4X the annual urban water demands of the City of Sacramento, the capitol of the State of California. This amount of water was allowed to pass through our control, untouched by any management, and lost to the Pacific. And Folsom is just one of many, many reservoirs. Imagine how much water all of California's reservoirs collectively lost?

"It is physically impossible to have a drought and flood in the same water year unless your infrastructure and operations are inadequate."

What does this kind of irresponsible loss mean to the poor Ag farmer or rancher who is then told by the government that their 2019 irrigation allocation is being curtailed because carryover storage in the (State or federal) reservoirs are not up to certain levels? They then must have to endure yet another water "shortage", while knowing that water operations let out millions of acre-feet only a few short months

earlier. Why should farmers and the Ag industry as a whole continue to suffer because of the ineffective and chronic poor water management of the State?

If the State is really concerned about establishing a climate-resilient system, it must take the inherent hydrology of the State seriously. There is plenty of water made available to California every year, even in years where the annual totals are well below average; the problem is that there are no facilities to capture the excess water. Moreover, virtually no one in the State acknowledges the need to close the system, so that flood control and water supply development can work together more efficiently and effectively. We still operate in management silos where, water supply, flood control, hydropower, water quality, and others, all operate largely independent of each other, to say nothing of climate change which has no distinct home and is treated in a very *ad hoc* fashion within the State's water resources management. Stop managing by silos and start integrating operations; meld water and flood control into one smooth overall water resource management division.

"There are true hydroclimatological droughts, then there are institutional droughts, infrastructural droughts, and regulatory droughts..."

Thank you for the opportunity to comment; please feel free to have your staff contact me if you require any additional information or further enhancements of this submittal.

Very sincerely yours,

THE SHIBATANI GROUP International
A Division of **The SHIBATANI GROUP, Inc.**

Robert Shibatani
Managing Partner & Principal Hydrologist

RS/sj

cc: The Hon. Governor Gavin Newsom
Anthony Rendon, Speaker of the Assembly
Wade Crowfoot, Secretary, California Natural Resources Agency
Lisa-Lien-Mager, Deputy Secretary Communications, California Natural Resources Agency
Eduardo Garcia, Assembly Member, Chair, Water, Parks and Wildlife Committee
Rachel Maddow, Host, TRMS, MSNBC
Jennifer Ludden, NPR
Christopher Joyce, NPR