

**Robert Pyke, Consulting Engineer**

November 23, 2013

Felicia Marcus

Chair

State Water Resources Control Board

1001 I Street

Sacramento, CA 95814

Re: Draft California Water Action Plan

Dear Felicia,

I greatly enjoyed your talk to the East Bay Leadership Council Water Task Force on Thursday morning – that meeting ranks as one of the more informative meetings that I have attended in the last five years - and have been moved, as you requested, to comment on the draft California Water Action Plan. I am, however, confining my remarks to just one subject, which is the promotion in the draft plan of the “earthquake bogey”, in order to emphasize its significance and the way in which it undercuts the credibility of the overall document. The “earthquake bogey” is a red herring that has been used for some years by the Metropolitan Water District and others to try to scare people into supporting what is now the curiously named Bay Delta Conservation Plan (BDCP).

As one example of the double talk that is involved here, I note that if the “earthquake bogey” was real, the BDCP would surely include further improvement of the Delta levee system to make it even more robust in the face of extreme floods and earthquakes, not only because the current preferred conveyance alternative in the BDCP includes significant through-Delta water conveyance but also because the Delta levee system is key to maintaining not only the islands and tracts in the Delta but also the waterways that form the aquatic component of the present-day Delta. I believe that it is in these waterways that people talk about restoring an aquatic ecosystem that is something like that which existed after the Delta was diked and drained but prior to large-scale water exports, rather than a totally new ecosystem in a wind-swept inland sea.

I am aware that the water exporters use the findings of the Delta Risk Management Study to prop up the “earthquake bogey” but that study was always flawed as a result of being schedule-driven rather than data and quality driven, and it is now out of date. The most up-to-date description and assessment of the Delta levee system is contained in the Economic Sustainability Plan (ESP) of the Delta Protection Commission. I have previously sent a summary of that assessment to the Governor and I am attaching a copy of that letter. As a result of some confusion on the part of the staff of the Delta Stewardship Council, the recommendations of the ESP were not fully included in the Delta Plan but I would urge you to fully include them in the Water Action Plan, or whatever the next version of this document might be called. I note that the material on the Delta levee system in the ESP passed muster by a peer review panel selected by the Delta Science Program with no significant concerns except for the estimated cost of the proposed further improvements. Those concerns were based on an inappropriate comparison to the New Orleans levee system and post-Katrina repairs and improvements and they are fully addressed in the final version of the Plan. I will admit some possible bias since I was one of the principal authors of the ESP, but to the best of my knowledge no qualified person has ever questioned the basic conclusions and recommendations of the ESP. Should you choose not to include the full set of recommendations of the ESP in the revised Water Action Plan, you will be giving preference to the statements of public relations hacks rather than qualified geotechnical and earthquake engineers. That would be unfortunate.

I have just two specific comments on the existing draft text of the Water Action Plan. The first is that the following paragraph is mostly gobbledegook:

*Many parts of California’s water system are vulnerable to earthquakes and flooding, particularly the Delta, which serves as the conveyance hub for a substantial percentage of all water supplies in the Bay Area, the San Joaquin Valley, and Southern California. A large earthquake along any of five major faults or a major storm-induced levee failure could render this water supply unusable for urban and agricultural needs for months. The combined benefits of all of the actions in this plan will better prepare us to manage through potential disruptions in the system.*

The first phrase in the first sentence is correct. Key components of the California water distribution system are at risk from earthquakes and the Department of Water Resources (DWR) has been dragging its feet in addressing this issue. In particular the B. F. Sisk (San Luis) Dam has known seismic issues but the combined efforts of the Bureau of Reclamation and DWR seem to be going nowhere fast in addressing these issues. However, the second sentence in particular is gobbledegook that could not have been

written by a person with relevant technical knowledge. In the unlikely but nonetheless possible event of the failure of one or more Delta levees in a major flood, the Delta will be awash with fresh water and, while the demand for exports would likely be small at that time, there would be no reason for exports to be interrupted because of salinity intrusion. It is true that DWR is still studying the possible effects of a worse than worst case scenario involving failure of up to 50 levees and flooding of up to 20 island as a result of some mythical earthquake, but it is my understanding that the latest studies have shown that even in this extreme case, which I judge to have a probability of occurrence of between 0.1 and 0.01 percent per year, the Delta would likely flush out within several months and six months at the most. I don't know what the five faults are that are referred to in this sentence, but if they are the possible sources within the Delta that have very low apparent slip rates and probabilities of rupturing, the earthquakes those sources might generate would likely be no larger than the Coalinga earthquake, which knocked houses off their foundations because they were not bolted to them, but did no significant damage to engineered structures. If the reference is to faults in the Bay Area, about which the BDCP public relations staff delight in pointing out there is something like a two-thirds chance of generating a high magnitude 6 or greater earthquake in the next 30 years, I note that the closest of those faults is 30 miles from the western edge of the Delta and that the testing of an embankment on Sherman Island by professors from UCLA, which was intended to replicate a nearby magnitude 7 earthquake, did not result in a failure of the peat foundation. Maybe the combined effect of the various actions that are proposed in the Water Action Plan will further reduce the chance of outages, but let's be realistic about the problems that are being addressed in the first place. A push to fast-track completion of the studies and start construction of the remedial measures at B. F. Sisk Dam is likely the single most important action that the Administration could take with regard to reducing earthquake risks.

My second comment is to commend you for supporting the concept of a Delta Levee Assessment District such as has been proposed by both the Delta Protection Commission and the Delta Stewardship Council:

*The administration will sponsor legislation establishing a Delta levee assessment district with authority to collect fees needed to repair and maintain more than a thousand miles of Delta levees, many of them privately constructed before modern engineering standards were in place.*

There are in fact less than a thousand miles of Delta levees that are currently maintained but my main problem with this language is the last phrase which is unbelievably

misleading. While it may be true that a few of the existing Delta levees are on alignments that may have started out as “private levees”, the Delta levees have been maintained and improved for years by reclamation districts that serve as agents of the State in carrying out the State’s responsibilities relative to Federal lands transferred to the State under the provisions of the Swamp and Overflowed Lands Acts. Further, since 1982, the State has contributed significant funding under both the subventions and special projects programs to make significant improvements to the Delta levee system with the overall goal of achieving the Delta-specific PL 84-99 standard that had been agreed to in 1982 by the State and federal governments. In spite of the negative propaganda on Delta levees that emanates from the more political elements within DWR, the DWR staff members that are responsible for these Delta levee programs are justifiably proud of the progress that has been made. The recent construction of “fat levees” on Jones Tract as a result of outstanding cooperation between the East Bay Municipal Utility District, DWR, the Department of Fish and Wildlife, and the local reclamation district showed both that it was possible to construct such levees in line with the cost estimates contained in the Economic Sustainability Plan and that it is possible to get stuff done even in an over-regulated society. In fact, the significant spending on the Delta levee system since 1982 means that most of the Delta levees have been effectively rebuilt in that time. The picture that is painted by the doomsday school of hundred-year old, non-engineered levees is just wrong. It would be more correct to say that the bulk of the levee system has been rebuilt in the last 30 years in accordance with modern engineering practices. Inclusion of the last phrase in the quotation above calls into question not only the validity of the remainder of the Water Action Plan but also the overall credibility of the Administration.

Sincerely,

A handwritten signature in cursive script that reads "Robert Pyke". The signature is written in dark ink on a white background.

Robert Pyke Ph.D., G.E.