Robert Pyke, Consulting Engineer

January 18, 2013

Secretary Ken Salazar
Department of the Interior
1849 C St, N.W. Washington DC 20240

Commissioner Michael Connor
Bureau of Reclamation
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Secretary John Laird
California Natural Resources Agency
1416 Ninth Street, Suite 1311
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Deputy Secretary Jerry Meral
California Natural Resources Agency
1416 Ninth Street, Suite 1311
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Re: **NRDC's Portfolio-Based Conceptual Alternative for the BDCP**

Gentlemen,

I am writing to encourage you to take seriously the various alternatives to the apparent preferred project of the BDCP that are now emerging. While I don't agree with all the details of the NRDC conceptual alternative, the NRDC is correct in suggesting that solely focusing on the Sacramento San Joaquin Delta, as the BDCP does, will not lead to a sustainable solution to California's water supply problems The NRDC conceptual alternative and other alternatives such as my own Western Delta Intakes Concept[1] must be taken seriously. The current range of alternatives under study by the BDCP are simply variations of the same theme and do not address some of the core problems we face.

Notwithstanding my support for including the NRDC conceptual alternative in a complete evaluation of alternatives, I would like to use it to provide both an example of the kind of discussion that has been lacking in the BDCP process and an explanation of why

[1] http://www.centralvalleybusinesstimes.com/links/WDIC%20description%205.pdf and http://www.centralvalleybusinesstimes.com/links/Addendum%20to%20Pyke%20White%20Paper.pdf

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piecemeal or potpourri solutions cannot solve the problem. I'll do this by walking through some of the features of the NRDC conceptual alternative.

New South of Delta Surface and/or Groundwater Storage – said to be up to 1 maf with competitive bidding to evaluate proposed surface, groundwater and conjunctive use projects. Looking at alternatives is fine – for instance, 1 maf of additional surface storage could perhaps be obtained by raising San Luis Dam in conjunction with a needed seismic retrofit – but the 1 maf figure is tiny relative to the real need. I am uncertain as to the accuracy of this figure, but the groundwater overdraft in the San Joaquin Valley is said to be as much as 60 maf. That's more the kind of number that we should be thinking about. That pore space is just sitting there waiting to be used. If we could recharge even half of that we would be in a much better position to survive a six-year drought.

Levee Improvements – said to be a $1 billion investment on improving existing levees and building setback levees with emphasis on the eight western islands. That's fine as far as it goes but the Economic Sustainability Plan (ESP) of the Delta Protection Commission suggested a basic engineering and construction cost of $1-2 billion and a possible overall program cost of $4 billion to improve most lowland levees to a new "fat levee" standard that would not only make them robust under earthquake loadings but would also provide improved flood protection, provide a base for future raises that might be necessary to address sea-level rise, and allow planting on the water side of the levees. Such levees have already been successfully constructed on Jones Tract. The goal should be to fix the levees properly, rather than just spending an arbitrary amount of money on them.

New Conveyance Facility – said to be a single tunnel sized for 3,000 cfs gravity flow and costing $5-7 billion dollars. Why not take $1-3 billion of that amount to further improve the levees and reap the ecosystem benefits of many miles of shaded riparian habitat? With the elimination of the earthquake bogey, the principal argument for any tunnel disappears and there is an additional $4 billion to spend constructively on something else, or not to spend at all, as the case may be.

But the biggest problem with this potpourri approach is that it fails to address the two main factors that have created the current crisis in the Delta: (1) that the natural flow regime in the Delta is highly altered, and (2) that too much water is extracted in dry years and there is no mechanism for taking much more water in wet years in order to place the excess in long-term storage facilities. Together, these two factors have led to the conversion of the Delta from an estuary into a weedy lake, with invasive species starting to dominate over native species. To be sure, the NRDC says that "project operations should utilize a "big gulp, little sip" approach that increases exports in wet years – when water is available in excess of environmental needs – and reduces diversions in average and drier years, particularly during key periods such as the spring and fall", but, similar to

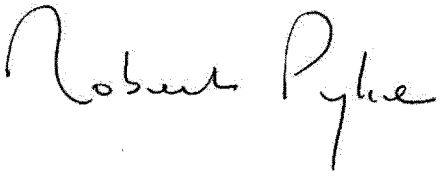
the BDCP, there is no mechanism for actually taking more water in wet years than in average years. What is needed is a mechanism for really taking more water in wetter than average years and storing the excess so as to provide a reserve for drought years. And, although the NRDC alternative is supposed to be more fish friendly than the BDCP, it continues to draw much of the water for export across the Delta to the South Delta pumps and millions of fish per year will be continue to be drawn into the "salvage" facilities and ultimately die.

It is impossible to overstate the importance of having a real "big gulp, little sip" approach as opposed to just paying lip service to it. When I am invited to talk about these issues, I always show graphs of the flows in both the Murray-Darling Basin in Australia and the Sacramento-San Joaquin Basin over a period of something like 100 years. The striking thing in both cases is not any long-term shift in the average flows but the enormous variability from wetter years to drier years and the fact that both the wetter years and the drier years come in bunches. The latter are known as droughts. There was a six-year drought in California from 1928-1934 and if you look at these graphs you will conclude, even without sophisticated analysis, that another six-year drought could occur in California at any time. People like Phil Isenberg, the Chair of the Delta Stewardship Council, like to say that we have to accept the fact that there is not enough water in California to go around, but that is only half-right. It is pretty much indisputable that there is not enough water for both fish and farmers in dry years, or periods of drought, but there is plenty of water in wet years, even allowing for the fact that the health of overall Bay-Delta ecosystem requires that a slug of this water is discharged to the ocean. The NRDC is absolutely correct that we should continue to place increased emphasis on water recycling, urban water conservation, urban stormwater capture, groundwater clean-up and conjunctive use. That will help us get through the drought years. But if we were smarter about managing the abundance of water in periods of above average precipitation and river flows, we would be able to not only sustain the vital farm economies in the Delta and in the Sacramento and San Joaquin Valleys, but to shepherd them through a six-year drought. The mechanism for doing that is to extract much more water in wet years and to store the excess south of the Delta, primarily in groundwater banks. I don't always agree with Mike Wade of the California Farm Water Coalition but he was correct when he said in a comment on the LA Times article reporting the release of the NRDC conceptual alternative that "Planning for a reliable water supply must continue to move forward. A smaller approach that ignores the needs of California's farm community is a step backwards and is the wrong choice for California."

When I talked to Dr Meral in May of 2011 he indicated that the then consultants wanted $100,000 to study each alternative that was to be considered in the BDCP EIR. Others that I have spoken to regarding the BDCP EIR process think that is ridiculous, or robbery, or something of that sort. Regardless, what was needed at that time, and is still needed today is a screening of a real range of alternatives, not a more detailed evaluation of a series of alternatives that are variations on the same theme. It does not take a lot of effort to do a screening analysis of this kind as is illustrated by attached evaluation of alternatives. I understand that a formal evaluation needs to be more quantified than my colorful table, but I submit to you that more formal, quantitative analyses will not change its basic conclusions.

If your immediate response to these comments is that they have come too late, you have simply not been listening to the comments on the BDCP that I and others have been making for the last several years regarding the need to consider additional approaches other than new intakes in the North Delta. It is not the comments that have come too late but the responsiveness of BDCP proponents to such comments has been largely nonexistent. I would be most interested in discussing with you whether you have any big disagreements with the attached evaluation of alternatives; it is not too late to face the fact that the concept of moving some water exports to the North Delta will never satisfactorily address the co-equal goals of the 2009 water legislation and that better alternatives are available.

Sincerely,



Robert Pyke Ph.D., G.E.

Attachment: An Evaluation of Alternatives to the BDCP, Robert Pyke, Consulting Engineer, January 16, 2012. See also: http://www.centralvalleybusinesstimes.com/links/Evaluation%20of%20Alternatives%204.pdf

An Evaluation of Alternatives to the BDCP
January 16, 2012

The Bay Delta Conservation Plan (BDCP) now appears to be struggling to achieve the co-equal goals of the Delta Reform Act of 2009. The time has come to more seriously consider alternatives that are not simply variations on the same theme of constructing an isolated conveyance around or under the Delta. In this note a simple comparison is made between the BDCP and three alternatives, the Western Delta Intakes Concept (WDIC), the Delta Economic Sustainability Plan (DESP), and the NRDC portfolio-based approach (NRDC).

The apparent preferred conveyance alternative that is currently included in the BDCP consists of three 3,000 cfs intakes located along the Sacramento River between Freeport and Courtland, a large forebay that is still searching for a suitable location, and something like 37-mile long twin tunnels that will take water by gravity flow to the vicinity of the existing South Delta pumping plants. The intakes will be provided with modern fish screens but the design of these fish screens is yet to be finalized and tested. Because use of the Sacramento River intakes will be limited by stringent bypass flow requirements, significant export flows will still be drawn across the Delta to the South Delta pumps but the BDCP includes no provision for channel or levee improvements. And the BDCP includes no mechanism for extracting more water in wet years to make up for extracting less water in dry years. To the contrary, the BDCP potential preferred alternative of February 2012 relied on reducing Delta flows during drier months to meet export water supply demands[2].

A more complete description of the WDIC can be found in Ä Self-Regulating, Inclusive and Sustainable Solution for the Sacramento San Joaquin Delta"[3]. In brief it includes a large forebay on Sherman Island into which water would be drawn through permeable embankments, which would serve as the world's largest fish screens, and tunnels less than half the length of the BDCP tunnels which would convey water to a new Brushy Creek Reservoir adjacent to the Clifton Court Forebay. It might also include a pumped storage hydro-electric facility between the Brushy Creek Reservoir and a further enlarged Los Vaqueros Reservoir to make the project energy positive. This scheme would be operated in conjunction with new South of Delta storage, mostly in currently drawn-down groundwater basins, to provide for as much as a six-year drought.

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[2] See Table C.A.-34 on page C.A-110: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/BDCP_Effects_Analysis_-_Appendix_5_C_Attachment_C_A_-_CALSIM_and_DSM2_Results_4-13-12.sflb.ashx

[3] http://www.centralvalleybusinesstimes.com/links/WDIC%20description%205.pdf

	Western Delta Intakes Concept	Bay Delta Conservation Plan	Delta Economic Sustainability Plan	NRDC Portfolio Plan
Cost	Middling	Highest	Lowest	Middling
Protects Delta from salt water intrusion	Yes	No	Yes	Maybe
Provides more sustainable export water supply	Sustained average exports in the order of 6 maf per year on average	Lower exports, maybe 4.7 maf, and no provision for a six-year drought	Even lower exports, maybe 4.2 maf, and no provision for a six year drought	4 -4.3 maf and 1 maf in recycling and conservation but no provision for a six year drought
Restores more natural flow through the Delta	Yes	No	No	No
Takes little or no water in periods of low flow	Yes	No	No	Maybe
Maintains both export and Delta water quality	Yes	Marginal	Marginal	Maybe
Creates new habitat	Yes	Yes	Mostly just riparian	Yes
Self-regulating	Yes	No	No	No
Simple to design, permit and construct	Yes	No	Yes	No
Negative impacts on the Delta as a Place	No	Yes	No	Not as bad
Negative impacts on Delta agriculture	No	Yes	No	Still pretty bad
Includes flood control benefits	Yes	No	Yes	Maybe
Contributes to improved transportation	Yes	No	No	No

Table 1 – A Simple Evaluation of Alternatives to the BDCP

What is called the DESP in this note is based on the recommendations of the Economic Sustainability Plan that was developed by the Delta Protection Commission[4]. The DESP alternative includes full implementation of the levee upgrades that are recommended in the Economic Sustainability Plan and habitat improvements that are compatible with existing farming operations. The DESP addresses head on the major reasons often cited in the media as justification for an isolated conveyance such as that proposed under the BDCP, which is that the Delta levees might explode or dissolve in a large earthquake leading to saltwater intrusion that might interrupt water exports for as long as three years. That scenario is hyperbole and is not supported by recent DWR studies of the consequences of even a worse than worst case levee failure scenario. However, the peer-reviewed Economic Sustainability Plan pointed out that a further-improved levee system would not only address the hazards to water exports posed by earthquakes but also would provide improved flood protection, would allow planting on the water side of levees to create shaded riparian habitat, and could be constructed for between $2-4 billion. While the Economic Sustainability Plan, which is directed solely to economic sustainability of the Delta does not address all current problems of the Delta, it is a far cheaper and less intrusive solution to the perceived earthquake problem than constructing twin tunnels under the Delta for $14 billion as proposed by the Day Delta Conservation Plan (BDCP) and it is far more cost-effective because levee improvements serve multiple purposes. The DESP can in fact be viewed as a "no regrets" first stage of the WDIC. The DESP components can and should be funded for immediate construction while the water exporters figure out whether they can afford the additional cost of the full WDIC.

The NRDC portfolio-based conceptual alternative[5] includes a single 3,000 cfs tunnel from the North Delta and more stringent bypass flow requirements than the BDCP. It includes $1 billion for levee improvements and provides for up to 1 maf of new South of Delta storage at an unspecified location. It calls for the conversion of 40,000 acres of Delta farmland to unspecified habitat, a smaller acerage than the BDCP, but still a significant number. It specifically calls for a $2 billion investment in water recycling and a $3 billion investment in urban conservation in order to reduce the demand for water south of the Delta by about 1 maf per year. Such efforts would not be discouraged under the BDCP, the WDIC and the DESP, however, no specific funding is provided under these plans and therefore the NRDC is credited with an additional 1 maf in terms of water supply reliability.

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[4] http://forecast.pacific.edu/desp.html

[5] http://switchboard.nrdc.org/blogs/bnelson/coalition_releases_a_new_portf.html

The colored backgrounds in each cell of the table indicate the relative success of each alternative with regard to the issues listed in the left-hand column, green indicating more success and red indicating less success or that the issue is ignored. The relative importance of the various issues could be indicated by varying the height of each row although that has not been done in this presentation. If that were done, greater weight would, for instance, be given to cost.

Even without more detailed scoring and weighting, it is clear that the BDCP comes in fourth among these four alternatives on both impacts and benefit-cost. The WDIC comes in first and the DESP and the NRDC are somewhere in-between. But all of the WDIC, the DESP and the NRDC are credible alternatives and therefore must be considered in any evaluation of alternatives that is required under NEPA or CEQA and the Clean Water Act Section 404 analysis, and in any comparative benefit-cost analyses undertaken as part of the BDCP.

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