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770 Tamalpais Drive, Suite 401  
Corte Madera, CA 94925

Phone 415.945.0600

Fax 415.945.0606

e-mail [fo@pwa-hd.com](mailto:fo@pwa-hd.com)

April 26, 2000

Karen Garrison  
NRDC  
71 Stevenson  
San Francisco, CA 94105

RE: Review of Lower Snake River Juvenile Salmon Migration EIS

Dear Karen:

As you requested, I have reviewed the U.S. Army Corps of Engineers Draft Feasibility Report/EIS, dated 12/99, to determine whether there is a feasible dam removal alternative that might provide greater environmental benefits, at lower cost and in a shorter timeframe than the 'Alternative 4 - Dam Breaching' project described in this report.

1 I have concluded that there is at least one other alternative that can be formulated and analyzed in the EIS process that better meets the purpose of the Study as articulated in Section 1.2: 'to evaluate and screen structural alternative measures that may increase the survival of juvenile anadromous fish through the Lower Snake River Project'. I characterize this course of action as a true 'Dam Decommissioning' alternative in contrast to Alternative 4 which is essentially a dam breaching with preserved structural facilities alternative. As described below, I believe a single objective dam decommissioning alternative is likely to be cheaper, quicker, and simpler to implement, have greater environmental benefits, and be more sustainable than Alternative 4.

2 In formulating the action plan for Alternative 4, the Corps has attempted to reconcile two somewhat competing objectives: to enhance fish passage and to preserve the concrete structural elements of the dam in place in the event a decision is made to re-commission the project in the future. This second objective is referred to in section 3.4 of the EIS, which states: '*modifications to structures would be done in such a manner that the structures could be restored to operating conditions with later modifications*'. This intended reversibility of the dam breaching alternative is further explained in Appendix D, Section 9.1 and Appendix D, Annex U. The attempt to preserve the concrete structures has led to a design that requires extensive river channelization and riprap bank protection, and significant modification of channel morphology in the vicinity of the dam.

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A single purpose dam decommissioning alternative that is intended purely to enhance fish passage at least cost would require removal of the spillway sections of each dam and probable removal of navigation locks and portions of the existing embankment as well. The power plant structures would not be demolished but be abandoned. This alternative would require much less extensive river channelization work and associated infrastructure relocation costs in the vicinity of the dam. It would not significantly alter river channel morphology and would restore the river channel to approximately its historic alignment. Based on earlier Corps estimates of a demolition time frame of 10 to 12 months for full concrete structure removal (Raytheon, 1998), it appears that removing just the spillway section, with less than half the concrete volume, could be accomplished in a single five month reservoir draw-down period. In addition, draw-down could be expedited – possibly eliminating the need for time consuming modifications to turbines, if the navigation locks were used for draw-downs at low reservoir levels.

It should be noted that this dam decommissioning alternative is substantially different and simpler than the full dam removal alternative examined and rejected in the EIS (see Annex X of Appendix D). The Corps' full dam removal alternative is essentially a phased plan that carries out two separate decommissioning projects in sequence, the first being Alternative 4, the second being full dam concrete structure removal. Phased in this way adds greatly to the cost.

3 I am not challenging the legitimacy of the rationale for formulating Alternative 4 and assessing its impacts in the EIS, however, it needs to be stated explicitly that this is a dam breaching with preservation of structure alternative, rather than a simple dam decommissioning project.

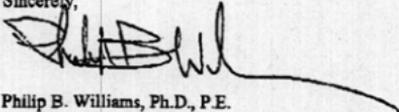
The following is a comparison of Alternative 4 and the single purpose dam decommissioning alternative I have described above:

1. **Environmental Benefits:** A simple dam decommissioning alternative would return the river to a more natural configuration at the dam site, allowing for more gradual variation in flow velocities and bed configuration within the channel. Fish passage in this reach of the river is likely to be easier due to lower velocities and crosscurrents. It also minimizes the need for extensive artificial rip rapped banks that limit the quality of riparian habitat. If this simpler alternative can be implemented quicker, salmon migration benefits would be greater. Compared to Alternative 4 and the Corp's phased full decommissioning alternative there will be less construction activity in the river channel both during decommissioning and in future maintenance.
2. **Cost:** There is a significant chance that implementation costs will be lower because extensive channelization, excavation, bank protection, new training levees and transportation facility relocation costs will be less. In addition it may be possible to eliminate or reduce the need for turbine modification if use of the navigation lock is included in the reservoir draw-down plan. Future bank protection remedial and maintenance costs would be significantly less (see below).

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3. Schedule: Alternative 4 would provide uninterrupted fish passage at the end of year 6 of the plan. It may be possible to accelerate this schedule with this alternative by reducing the need for channelization engineering and by simplifying the draw-down using the navigation lock.
  
4. Sustainability: Alternative 4 is unlikely to be sustainable. It requires the training levees upstream and downstream of the preserved dam structure to remain intact in floods of up to 420,000 cfs. Further hydraulics analysis that the Corps intends to carry out at a later stage will show that because of the sharp deflecting angle of these levees projecting into the direction of the flood flow, they are likely to induce substantial bed scour that undermines the levee in even smaller floods. Once the upstream levee fails, the full force of the flood flow will impinge directly on the concrete dam structure, causing powerful eddies that will scour and undermine both banks. Even without levee failure, the reconfigured channel will tend to create a 'ricochet' affect downstream during flood flows, with the main force of the flood impinging on alternate banks for a considerable distance downstream. This is likely to require substantial continued remedial erosion control work that would further degrade potentially restorable riparian habitat. In contrast, a simple dam decommissioning alternative could be designed to minimize these impacts.

Sincerely,



Philip B. Williams, Ph.D., P.E.  
President

April 24, 2000

Mr. Lonnie Mettler  
Lead Planner  
Department of the Army  
Walla Walla District  
Corp of Engineers  
Walla Walla, WA 99362-1876

**Subject: Review of the DEIS on the Lower Snake River**

Dear Mr. Mettler:

I have reviewed the Draft Environmental Impact Statement entitled *Lower Snake River Juvenile Salmon Migration Feasibility Report* of December 1999. I have performed this review for the Natural Resource Defense Council (NRDC) and with a perspective related to my ongoing work on the Federal Energy Regulatory Commission relicensing process of the Hells Canyon dam complex. The Snake River historically has been an integrated ecosystem and its future requires bold and innovative approaches to the traditional management and engineering works of the past.

I applaud the Corp of Engineers for taking the initiative to evaluate the potential for dam decommissioning, outlined in Alternative No. 4. The Environmental Impact Statement (EIS) and alternative development are required because of the continuing decline of the salmon species that depend upon the Snake River system for their survival. The information displayed in the EIS and the comments that have been stated in the public meetings certainly solidifies what we have known for quite some time. Drastic action is necessary if we are truly committed to the salmon's survival and eventual recovery.

Alternatives 1, 2 and 3 clearly fail to recognize that in spite of increasing fish transportation and engineered bypass systems, the actual smolt-to-adult ratios (SAR) for the spring and summer Chinook salmon has not increased. Overall, in spite of all the hopes, the salmon populations of the Snake River are not increasing. Clearly more drastic measures are necessary and the concept of **Alternative 4** is a step in the right direction. It fails however in achieving the timetable or overall ecosystem needs of the salmon.

4 | The development and presentation of Alternative 4, dam decommissioning, is stated as being a fisheries restoration alternative. In closer examination it reflects a formulation to protect the concrete investment of the Corp of Engineers and will likely be limited in its desired effect to lead to an improved salmon population. The reasons for this are:

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- Timing of the decommissioning is too long. In the timeline presented it is likely that the salmon will decline to such low levels that they will not be able to rebound once the river is returned to a more normal environment.
- The engineering design for the earthen dam removal, levee development and training structures appear to have been ordained as the prescribed approach. This fails to recognize the dynamic nature of the river, the lack of consideration of flood potential, and the overall intent to protect the concrete that has been already poured.
- An engineering risk assessment on the proposed decommissioning approach has not been presented. It is not clear that the approach recommended would work or would be able to sustain the dynamic nature of the Snake River.
- The evaluation of modifying the existing spillways to accommodate a more normative river has not been completed. Thereby contraining the consideration of a more timely and less costly approach to dam decommissioning and thereby potentially compromising the overall intent of the alternative.

The clear intent of Alternative 4 is stated in Section 3.4 of the EIS, *modifications to structures would be done in such a manner that the structures could be restored to operating conditions with later modifications.* It would appear with that statement that the intent of Alternative 4 to restore the salmon populations is being compromised by the desire to keep engineering options open.

A more logical approach, and certainly a less costly and more timely effort, would dictate a thorough evaluation of the potential to initially deconstruct the spillways and navigation locks and to utilize their potential to route the river downstream until the earthen sections can be removed. By modifying the spillways and navigation locks a more controlled, timely and more cost efficient decommissioning process can occur. What is presented represents one foot being kept in the *concrete* while the other is attempting to step to the future. Your efforts are appreciated; it is the approach that is questioned.

I would like to recommend that the Corp meet with the Natural Resources Defense Council and other appropriate entities to discuss an alternative for the final EIS that reflects a logic that will have a higher probability for success. Specifically:

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- A discussion of an alternative for dam decommissioning that:
    - Phases initial efforts on the opening of the spillways and navigation locks to route the Snake River downstream
    - Develop a process that will allow for the systematic and complete removal of the elements of the dam that constrains the Snake River from achieving its dynamic form and nature.
    - Evaluate alternative timing approaches that would allow for an overall reduction in cost and time to completion
    - Perform additional analysis on approaches for decommissioning, including evaluation of upstream management options in the upper and middle Snake

River which may help to lessen the potential for floods during the decommissioning process.

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It is clear that the existing EIS document is incomplete until it addresses additional approaches for decommissioning. You have gotten the concept of evaluating decommissioning included and that is an important first step. Dam decommissioning is a new endeavor for the Corp of Engineers. An endeavor that requires an approach that meets the long-term need of the region and the salmon species. This mandates and requires us to think outside of the traditional engineering box and identify what is needed to meet the goals for the future.

Good luck on your efforts and please include my comments in the review of the EIS. Let's work together to find the best actions for the future of the river and the salmon species.

Sincerely,

David L. Wegner  
Principal Scientist

cc. Karen Garrison, Natural Resources Defense Council, San Francisco, CA