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April 27, 2007

Mr. Greg King and Ms. Erica Terrence
Northcoast Environmental Center
1465 G Street
Arcata, California 95521

Subject: Impressions from Klamath Science Meeting
Klamath Independent Review Project (KIRP)

Dear Greg and Erica:

This letter was prepared in response to attending the Klamath Science meeting in Mt. Shasta, California, on April 10 and 11, 2008. At this meeting, I was able to gain more insight into the science behind the Settlement Agreement and discuss the comments, questions and recommendations I put forth in my November 9, 2007 letter to the Northcoast Environmental Center (NEC) with the subject heading, "Independent Model Review for Klamath Settlement Negotiations, Klamath Independent Review Project (KIRP)." This meeting also provided the opportunity to align my November 9 comments with the current version (Draft 11, January 15, 2008) of the Settlement Agreement (SA). I've learned that the final language contained in the Agreement addresses and negates some of my stated concerns, which were based on earlier draft versions of the Agreement. Presented below is a summary of my main concerns (bold italic text) taken from the November 9 letter and how these concerns have been addressed and alleviated (plain text) during the Science meeting or in review of the current SA.

1. ***The SA does not identify specific project areas that will provide the needed increase in UKL storage.*** Section 17.2 of Draft 11 of the SA provides the location and acreage for restoration projects that have or will cumulatively provide the added 100K AF of storage to UKL.

2. **How will the SA confirm that water supply gains are attained through water budget and evapotranspiration analyses?** Further development and expansion of the USGS hydrologic model is funded and thoroughly explained in Draft 11 of SA. As recommended, the SA indicates that this tool will be used as the means to verify targets and thresholds specified in the Water Resources Program.

3. ***How will the SA verify that additional 30K AF of inflow to UKL will be realized through land conversion?*** (see response 2. above)

4. ***I recommend that the Settlement Group endorse and support the development and maintenance of a watershed-scale integrated surface water-groundwater model used to: a) evaluate how changes in groundwater pumping impact the overall upper basin water budget; 2) evaluate how changes in groundwater pumping effect surface water***

flow and inflow to UKL; 3) evaluate how changes in land use and vegetation effect the overall upper basin water budget and inflows to UKL; and 4) provide quantitative estimates of the above mentioned water budget variables that can then be used to establish specific safe-yield groundwater use requirements. (see response 2. above)

5. ***Determine impacts to salmonids due to decreased river flow rates during the September-February period, especially under the R32_NewStorage alternative conditions.*** See Klamath Science meeting comments by Dr. Thomas Hardy, April 23, 2008.

6. ***Complete a hybrid model simulation that imposes a drought on the "Interim" Agreement period. This simulation would likely represent a worst-case dry-year scenario over the "Interim" Settlement Agreement period***. We did not discuss this comment specifically, but from related discussions during the Science meeting and Appendix A of Draft 11 of the SA, I better understand prioritization of Drought Plan, Emergency Response Plan and Climate Change Assessment and where they fall within Agreement implementation schedule.

7. ***Determine how the shifted UKL annual storage hydrograph and significantly reduced (from historic) "Interim" lake levels impact the aquatic/wetland ecology and water quality of UKL.*** Larry Dunsmore provided a lot of insight to this concern as it relates to potential impacts to UKL. According to Larry, the shift in seasonal hydrograph will actually be better aligned with a more natural pattern than what has occurred historically. In addition, the ecological benefits associated with increased wetland habitat area due to UKL expansion will likely significantly out-weigh the adverse effects associated with lower lake levels.

8. ***Delete language in the Settlement Agreement that endorses the use of groundwater as a measure to augment surface water flow and irrigation until a complete and comprehensive analysis and understanding of associated impacts of the upper basin water budget are determined, likely from USGS groundwater modeling.*** Appears that this or acceptably similar language has been incorporated into Draft 11 of SA (see section entitled, "New Wells" on page 63).

9. ***The Settlement Agreement should contain specific language to ensure that water and water rights associated with land conversion or retirement are retained for instream beneficial use.*** These concerns/needs are addressed under current groundwater adjudications and Oregon Groundwater rights.

10. ***Clarify the definition of "adverse impact" in the Settlement Agreement in Section 15.2.4 to include a 6% reduction (relative to the 2000 baseline condition) in the cumulative inflow to UKL. This includes springs and stream inflows from areas out-side of the KIP area.*** Section 15.2.4 of Draft 11 of the Settlement Agreement provides a better quantified and location-specific definition of adverse impact.

11. ***The Settlement Agreement should specify guidelines and protocols to verify that land retirement in the off-project areas is providing the desired annual increase in inflow (30K AF) to UKL. Two possible independent methods include: 1) flow monitoring and water budgeting of UKL and 2) water budget tracking using the USGS groundwater-based model.*** This item was discussed at length during the Science Meeting and I've come to feel that this issue is likely being addressed as best as practical at this time. Both physical monitoring and UGSG numerical modeling will be used to track changes and identify potential adverse impacts if they occur.

12. ***Develop more detailed, verifiable and enforceable drought emergency response and adaptive management plan language for the Settlement Agreement. Ensure that there are triggers in place that allow participants to revisit and modify operations if egregious allocations result during droughts or other situations.*** Section 18 of Draft 11 of the SA appears to have evolved along these lines, at least to the best as possible until the Drought and Emergency Response Plans and Climate Change Assessment are initiated.

I appreciate the opportunity to learn more about the specific scientific analyses behind development of the Settlement Agreement and to have obtained clarification to my stated concerns. It was also a unique opportunity to learn of and discuss some of the strategic decisions regarding the stated restoration goals contained (or not contained) in the Settlement Agreement. I strongly support the development and incorporation of the USFWS "White Paper" into the Agreement with the intent to summarize and publicize the opportunities and constraints to ecological restoration within the basin under a variety of Settlement Agreement alternatives.

Finally, I would like to take the opportunity to make a recommendation. It is my opinion that as it is currently written, there is an imbalance in stated goals in Draft 11 of the SA, such that a layperson reading it could perceive that there are more benefits and guarantees being provided to irrigators versus fish. Having attended the Klamath Science meeting, I've been fortunate to learn more about the history, study focus and commitment of resource managers to improve fish habitat. A lay person reading the Agreement for the first time, however, will not gain this perspective. Therefore, I believe that stating more definitive goals for fish habitat improvement will benefit the Agreement and address the perceived imbalance. If asked if I would support the Settlement Agreement as currently written, I would do so.

If you have any questions or would like to discuss the contents of this letter, please don't hesitate to contact me.

Sincerely,

Greg Kamman
Principal Hydrologist