

## **BLM Study Review of Hells Canyon Complex Studies**

### **Exhibit E Environmental Report**

#### **E.3.0. Geomorphology and Sediment**

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#### **1. INTRODUCTION**

This section is included in the Environmental Report under E.3. REPORT ON FISH, WILDLIFE, AND BOTANICAL RESOURCES as a precursor to the discussion on availability of and reasons for lack of spawning gravels and sandbars below HCC. This section is supported by Technical Appendices E.1-1 through E.1-4 that contain more detailed analysis and support for the Geomorphology and Sediment portion of the draft license.

#### **2. CONCLUSION**

Generally, the Geomorphology and Sediment portion of the draft license concludes that flows experienced in historical times are less than in the Pleistocene, that flood flows from events like the breach of Lake Bonneville have created a bed and bank armor that is relatively stable under current flow regimes, that anthropomorphic sediment causation from farming, timber, grazing, trapping, etc. starting in the early 1800's has lessened in recent times by land use changes and better management practices, that upstream dam development now intercepts much of the sediment production in the upper basin that otherwise would reach the HCC, and that other than the anthropomorphic "slug" of sediment predating the HCC, the mainstem channel has apparently been generally sediment deficient with respect to the upstream supply of sediment over a long geologic timescale. (See Pages E.3-3 to E.3-7 of the draft application and Executive Summary of Technical Appendix E.1-2).

**The BLM generally agrees that the applicants premise is reasonable and the analysis would allow a reasonable person to draw these same conclusions.**

**However, both the analysis and the conclusions about the sediment production and its importance below the HCC compared to the analysis of sediment produced and entrapped within the HCC appears to be deliberately slanted or weighted to lead to lead to the conclusion that within HCC sediment sources are insignificant while sources below HCC are highly important to maintaining spawning beds and sandbars below the dam. BLM disagrees that the studies relative to this aspect of the license and the impacts of the existing dams are either correct or adequate and does not believe that the conclusions are supported**

#### **3. STUDY ADEQUACY**

The attached Table 1 indicates how the analysis of sediment production between these two areas is treated and provides comments on specific issues relevant to the analysis.

#### **4. BLM CONCLUSIONS AND RECOMMENDATIONS**

##### **CONCLUSIONS:**

Studies of sediment production provided in the Application and Technical Appendices, particularly for sand and larger sized components, appear to use different premises and methodologies between the analysis of sediment yield for the within HCC reach and the downstream HCC reach. As comments in the attached Table 1 indicate, the effect of these differences is to understate and underestimate sediment production from local sources within the HCC complex that are retained in the reservoirs behind the dams, while at the same time, implying that sediment production from similar situations below the HCC complex are supplying sufficient sediment to maintain spawning beds and sandbars, or, if they are not, the loss of these features is related to upstream (above HCC) sediment reduction and these features are relics of an anthropomorphic “slug” of sediment unrelated to the construction of the HCC. The treatment of the within HCC sediment analysis appears to be calculated to demonstrate minimal responsibility for the loss of these features due to dam construction in an effort to control potential mitigation costs.

##### **RECOMMENDATIONS:**

1. The analysis of both the within and below HCC reaches has to done in a way that demonstrates scientific integrity by using comparable assumptions, rigor, and methodology.
2. Absent any reliable sediment yield data for the within HCC, BLM suggests that the same sediment yield estimation used below HCC be used for the within HCC reach (average sediment yield of 28,100 tons/square mile/year) for all of the drainage area directly adjacent to the reservoir characterized by “. . . steep slopes, relatively small drainage areas, and limited ground cover resulting from arid conditions, high sediment yields . . .” (Page 5-16, Technical Report E 1-2).
3. Any reduction of this estimator for larger, lower gradient tributaries draining into the HCC reservoirs needs to demonstrated with credible scientific analyses and be comparable to results obtained by independent scientific studies in drainages with comparable characteristics.
4. BLM further recommends that a similar hillslope sediment factor be added to the within HCC reach that is used below HCC.
5. Sediment production for the within HCC reach caused by extreme events (particularly historical events like the 1997 flood) need to acknowledged as important sediment contributors (similar to the below HCC analysis) that will be foregone from sandbar and spawning gravel maintenance because of retention in the HCC reservoirs.
6. Once these studies are completed and reviewed, the impact of the loss of sediment production from this reach needs to be reanalyzed relative to impacts to fisheries (spawning gravels) and recreation (sandbars).
7. If these impacts are deemed significant through the agency and public consultation and review process, appropriate mitigation alternatives should be

proposed by the applicant, or in the absence of an applicant's proposal, by the agencies and the public.