Development of Inflow Hydrology For Hells Canyon Complex Studies (E.1-4, Chapter 2) (Appendix C-F)

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I. Introduction

This study selected the best alternative for modeling inflow to the Hells Canyon Complex. Seven alternatives were identified. The alternative that was easiest to apply within the time frame of the study and would adequately preserve the desired statistical properties found in the historically observed data would be chosen.

II. Conclusions

1. "Seven alternatives were presented for study selection:

1. *Direct stochastic generation of annual inflows and two stage disaggregation (first to monthly inflows and then to daily inflows) using time series models.*
2. *Direct stochastic generation of annual inflows, with disaggregation to monthly inflows using time series models and to daily inflows using pattern-fitting techniques.*
3. *Direct stochastic generation of monthly inflows and disaggregation to daily inflows using time series models.*
4. *Direct stochastic generation of monthly inflows and disaggregation to daily inflows using pattern-fitting techniques (direct use of historic daily pattern).*
5. *Direct stochastic generation of weekly inflows and disaggregation to daily inflows using time series models.*
6. *Direct stochastic generation of weekly inflows and disaggregation to daily inflows using time pattern-fitting techniques.*
7. *Direct generation of daily inflows." (Page 1-3, Appendix C)." (Page 51, Paragraph 4)*

"In addition to developing a record of inflow hydrology at Weiser, other inflow files were also developed to account for additional water from tributaries as well as reach gains and losses to Brownlee, Oxbow, and Hells Canyon reservoirs for the purposes of operations modeling." (Pages 1-2, Appendix D)

"The study objective was to demonstrate an approach for generation of realistic sequences of synthetic streamflows using stochastic streamflow generation techniques. "The streamflows may be later used in reservoir operations models and in studies of the

effects of those operations." Appendix E describes the statistical analysis. "This activity used an existing times series analysis package, "Stochastic Analysis, Modeling, and Simulation (SAMS)." (Page 1, Paragraph 2, Appendix F and Page 8, Figure 1)

"The study produced 100 separate sequences of streamflow which are reasonable sequences of streamflow for the time horizon of 50 years into the future. Comparisons were made that demonstrate the generated streamflows are reasonable." (Page 1, Paragraph 2, Appendix E)

"The study plotted traces (streamflow sequences) that compared known streamflow data to the expanded synthetically generated streamflow data. The results showed a good correlation that could then be used to select the input to the model." (Page 7, Paragraph 1, Appendix E)

"In Appendix F the study used stochastic analysis to evaluate flood frequency. The average flow for these traces indicates the variability in flow that could be expected of the long term (5,000 years). They focused on droughts that are most likely to affect vegetation in the study area. They developed a summary of drought information from both the historic and the stochastic records." (Page 2, Paragraph 3, Appendix F)

"The model also examined high flow events. It generated a value of 40 million acre feet (maf) which is higher than the 25maf that currently is the 1910 record at Weiser gage. The model suggests that flows in the range of 25-40 maf could be higher 3 or 4 years out of 100 than those that occurred historically." (Page 2, Paragraph 1, Appendix F)

Response: The BLM agrees with the approach described for developing a flow input model to the Hells Canyon Complex. Appendix A through F presents the analysis of potential approaches that lead to the selection of the hybrid approach described in Chapter 2.

III. Study Adequacy

The study appears to be adequate for selecting the best approach for modeling inflow to the Hells Canyon Complex.

IV. BLM Conclusions and Recommendations

Conclusions

1. The BLM concludes that the approach to developing the inflow model is adequate and meets scientific standards of rigor.

Recommendations

1. The BLM should accept the study.