



FISH PASSAGE CENTER

2501 SW First Avenue, Suite 230, Portland, OR 97201-4752

Phone: (503) 230-4099 Fax: (503) 230-7559

<http://www.fpc.org>

e-mail us at fpcstaff@fpc.org

MEMORANDUM

TO: FPAC

FROM: David A. Benner

DATE: October 1, 2004

RE: Miscalibrated Spill at Bonneville Dam

This memo is the follow-up analysis you requested after the August 10th, 2004 FPAC meeting. At the August 4, 2004 Technical Management Team meeting, the COE distributed a summary of the miscalibration of spill at Bonneville Dam. This summary is available at the following web address: <http://www.nwd-wc.usace.army.mil/tmt/agendas/2004/0804.html>. In this document, the COE outlines the differences in reported and potential spill levels for various levels of spill at Bonneville Dam (Table 1).

Table 1. Differences in reported versus potential spill flow at Bonneville Dam at various spill levels.

Spill Flow Quantities Based on Current Dog Markings		
Reported Spill Flow (Kcfs)	Potential Spill Flow (Kcfs)	Percent Difference
50	35	29.8
75	64	14.5
100	90	9.6
125	118	5.6
150	143	4.1

According to the COE, the above discrepancy could have dated back to the 1970's, but became more apparent in 2002 when the spill pattern was changed to a spread out pattern across all 18-spill bays, all with small gate openings.

Using information provided by the COE, I have summed miscalibrated spill at Bonneville Dam since April of 2002. For this calculation, I utilized hourly reported spill data for Bonneville Dam

between April 1, 2002 and August 31st, 2004. Hourly spill levels were divided into three blocks that bracketed the first three reported spill levels in Table 1 (50, 75, 100 Kcfs): spill range between 37.5 and 62.5 Kcfs, spill range between 62.6 and 87.5 Kcfs, and spill range between 87.6 and 112.5 Kcfs. Spills of above 112.5 Kcfs were not included in this analysis because at spill levels above 112.5 Kcfs, spill begins to be constrained by the TDG Gas Cap.

If reported spill for an hourly data point was between 37.5 and 62.5 Kcfs, then the hourly reported spill was multiplied by a factor of 0.298 (percent difference in above table associated with spill level of 50 Kcfs) and converted to a volume in Kaf. This volume represented the amount that spill was overestimated for that hour, relative to the potential level. If reported spill for an hourly data point was between 62.6 and 87.5 Kcfs, then the hourly reported spill was multiplied by a factor of 0.145 (percent difference in above table associated with spill level of 75 Kcfs). If reported spill for an hourly data point was between 87.6 and 112.5 Kcfs, then the hourly reported spill was multiplied by a factor of 0.096 (percent difference in above table associated with spill level of 100 Kcfs).

In summary, between April 2002 and August 2004, spill was overestimated by 937 Kaf when reported hourly spill ranged between 37.5 and 62.5 Kcfs. When hourly reported spill ranged between 62.6 and 87.5 Kcfs, spill was overestimated by 4184 Kaf; and when reported spill ranged between 87.6 and 112.5 Kcfs, spill was overestimated by 685 Kaf. In total, between the spill levels of 37.5 Kcfs and 112.5 Kcfs at Bonneville Dam between April 2002 and August 2004, spill was overestimated by 5806 Kaf. For scale, this volume is more than the useable storage at Grand Coulee Dam (5185 Kaf). Also, if this water were distributed evenly over the 432 days that encompassed the spill seasons in 2002, 2003, and 2004, this would leave 13.4 Kaf or 6.8 Kcfs for each of those days.