United States Department of Agriculture | Forest Service | Region One | 200 East Broadway P.O. Box 7669 Missoula, MT 59807

File Code: 7500 Date: September 3, 2003
Route To:

Subject: Evaluation of Tincup Dam

To: Forest Supervisor Bitterroot National Forest

The Tincup Dam, located approximate 14 miles west of Darby, Montana, is in imminent danger of failure for the following reasons,

- The current spillway configuration is not the recommended 1998 design configuration. Consequently, the spillway is not able to evacuate water from the reservoir quickly enough to ensure the Tincup Dam is not overtopped at the current crest elevation of 6,288.7 feet. The lowered dam crest in combination with the undersized spillway allows only inflows with an approximately 20% chance of occurring any given year (5 year flood event) to safely pass the spillway before the reservoir pool elevation exceeds the dam crest.

  Unfortunately, it appears inflows into the reservoir from snowmelt have nearly overtopped the dam 4 of the last 5 years exceeding statistical expectations. Based on this it is highly likely Tincup Dam will overtop and fail in the spring of 2004. Therefore, emergency measures need to be undertaken this Fall to place the Tincup Dam in a safe condition before snows accumulate and prevent construction activities.

- During a visit to Tincup Dam by Forest Service personnel on July 17, 2003 a debris line marking the high water elevation was observed in the breach indicating water had entered the breach area at some point in the spring or early summer of 2003. Water in the breach area has caused the formation of a sinkhole. In the event the reservoir pool elevation reaches the breach/lowered crest area in 2004 there is a high probability of failing the Tincup Dam by piping.

Based on these observations it is my recommendation that a dike be constructed in the breach/lowered crest area to a minimum height of 6,294 feet to prevent the failure of the Tincup Dam during moderate and extreme events. This will also allow the spillway to pass flows resulting from more conservative estimates of the ½ PMF event with minor modifications to the spillway. The maximum long-term pool elevation should be limited to 6,290 feet until the dam is reconstructed in a manner that addresses known structural weaknesses.

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Director of Engineering