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OAK RIDGE NATIONAL LABORATORY
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NUCLEAR DIVISION

POST OFFICE BOX X
OAK RIDGE, TENNESSEE 37830

November 16, 1983

Mr. Ed Hawkins
U.S. Nuclear Regulatory Commission
Uranium Recovery Field Office
P.O. Box 25325
Denver, CO 80225

Dear Mr. Hawkins:

RE: Edgemont Mill, Docket #40-1341

I have reviewed TVA's analysis of the impact of the "probable maximum precipitation" (PMP) on operation of Pond #10 at Edgemont. Although my numbers are larger than TVA's for the PMP (20" versus 16" of rain for a 6-hour duration storm at Edgemont, see enclosed figures), I agree with TVA's end result. Pond #10's capacity is capable of storing the PMP if maximum operating capacity of 50 acre feet is observed and TVA can verify that the catchment area adjacent to the haul road is no greater than 19 acres. A properly scaled map showing drainage divides should suffice for this purpose.

Using my estimates for the PMP the total volume of water in the impoundment after a 72 hour event would be a maximum of 150 acre feet (Table 1) as opposed to TVA's estimate of 131 acre feet. This is still only 1/2 the maximum capacity of Pond #10 allowing for 2 feet of freeboard. Thus a 100 year sequential precipitation event could also be accommodated.

Because Pond #10's service life is only about 10 years, it is appropriate to analyze the erosion risk to the outer embankment with respect to the 100 year flood. TVA provided such an analysis in their August, 1983 report. According to their analysis the 100 year combined flood plain of the Cheyenne River and Cottonwood Creek is substantially below the toe of Pond #10's embankment. The lowest elevation of the

embankment's toe is 3466 feet in the northwest corner of the impoundment whereas the highwater mark on Cottonwood Creek near the site boundary is 3442 feet.

Copies of an earlier transmittal (ORNL's seepage analysis and embankment stability) are enclosed.

Sincerely,

William P. Staub

William P. Staub
Geotechnical Engineer

WPS:db

Enclosure: Figures from "Design of Small Dams" Seepage Analysis, Embankment Stability

cc: M. J. Kelly

TABLE 1. PMP Summary, Duration Versus Volume
Compared to Storage Capacity

PMP Duration (Hours)	Rainfall (Inches)	Runoff Volumes (Acre Feet) Pond	Haul Road	Maximum Normal Operating Volume (Acre Feet)	Total Volume (Acre Feet)
6	20	33	27	50	110
48	30	50	43	50	143
72	32	53	47	50	150

Total Storage Capacity = 342 acre feet - 40 acre feet (2 feet of freeboard)
= 302 acre feet

Figure 15. Probable maximum precipitation (inches) east of the 105° meridian for an area of 10 square miles and 6 hours' duration. 288-D-2449A, 288-D-2754, 288-D-2755.

durations shorter than 6 hours, the time distribution of precipitation can be obtained from curve C, figure 18. After the publication of Hydrometeorological Report No. 33, the Corps of Engineers recommended [12] that the following reductions be applied to the report values in order to provide for the imperfect "fit" of storm isohyetal patterns to the shape of a particular basin.

Drainage area (square miles)	*Reduction factor applicable to H.R. 33 rainfall values (percent)*
1,000	10.0
500	10.0
200	11.0
100	13.0
50	15.0
10	20.0

[12] Engineer Circular No. 1110-2-27, dat 1 August 1, 1966, "Policies and Procedures Pertaining to Determination of Spillway Capacities and Freeboard Allowances for Dams."

*The NWS (National Weather Service) periodically updates these maps. Therefore, it is suggested that the user utilize the latest map of the NWS.

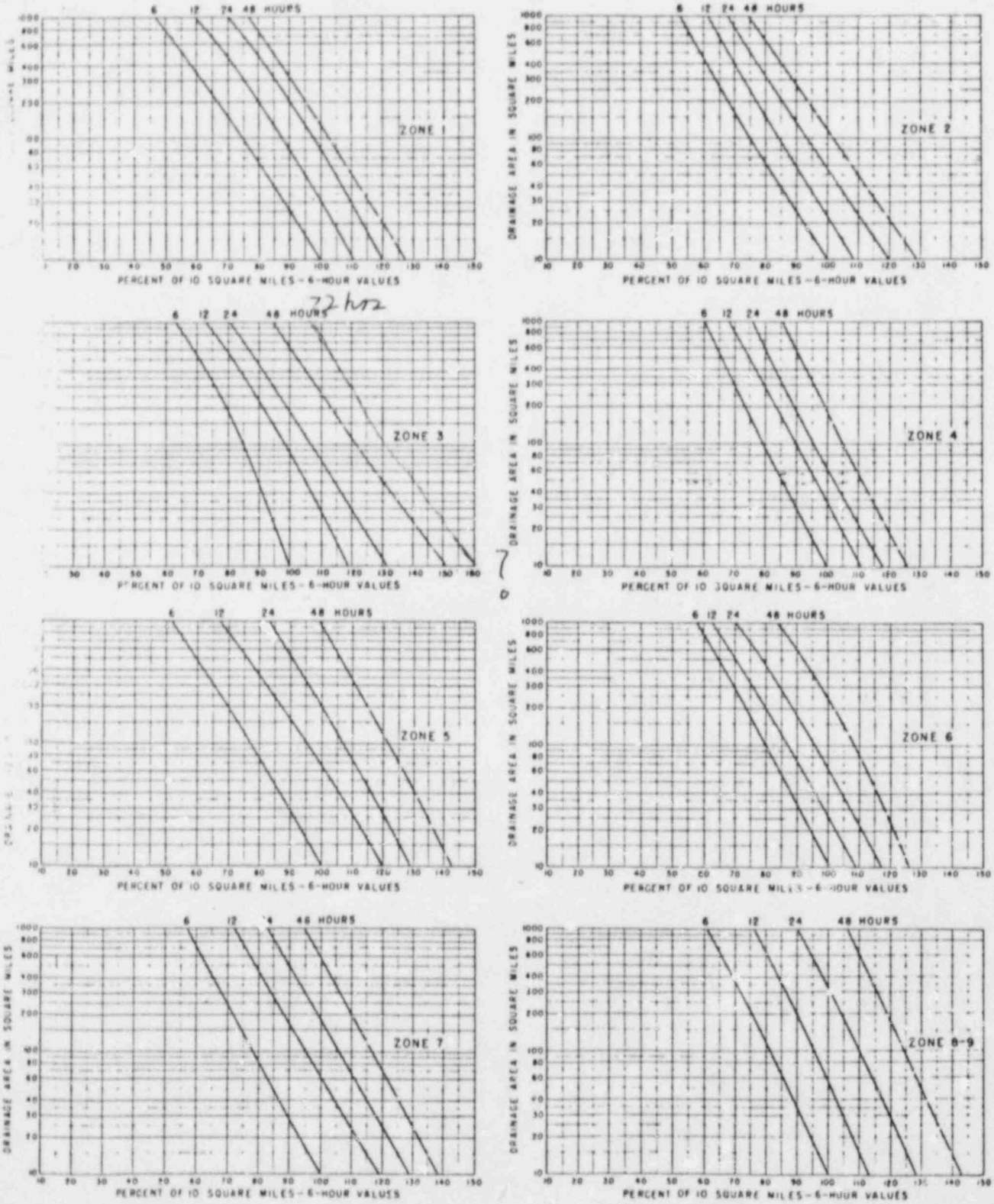

Figure 16. Depth-area-duration relationships. Percentage to be applied to 10 square miles, 6-hour probable maximum precipitation values. 288-D-2450.