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Hello xxxxx,

I am doing this response in Word because it is easier to write the math. Here is a quick analysis of the hydraulic capacity of the emergency spillway:

Drainage Area- 64.7 Sq.Mi., or 41,408 Acres.

Rainfall- The 100 year 24 hour rainfall event is 6.0 inches, meaning that a 6 inch rainfall over 24 hours has a 1% chance every year. It is possible to have two 6.0 inches of rainfall events on succeeding days. Therefore, we need to look at the rates.

Assuming that all of the rainfall ran off for one day of maximum rain 20,704 Ac-Ft of water would enter the lake.

Emergency Spillway and Embankment- The top of the embankment is at 2475 and the crest of the emergency spillway is at 2462. 2475-2462 = 13 feet of available head before the dam is overtopped. The emergency spillway is a secant ogive, which is the most hydraulically efficient shape. The length of the spillway scaled from the drawings of the dam is ~700 feet.

The weir equation for an overflow spillway section is $Q = CLh_e^{1.5}$, (Ven Te Chow, Open Channel Hydraulics, pp. 363-368), where Q is discharge in cfs, C is the weir coefficient 4.03, and h_e is the effective head. Assume an effective design head of 12 feet. Therefore, $Q = 4.03 \times 700 \times 12^{1.5}$, or 117,300 cfs, or ~2.7 Ac-Ft/sec.

The area of the lake at elevation 2462 is ~3,937 Acres. 20,704 Ac-Ft/3,937 Acres = 5.25 Feet.

Therefore, if the spillway has 10 feet of depth head and 2 feet of velocity head it would take a little over two hours to pass the 20,704 Ac-Ft of inflow. But consider this.

If the lake was at stage 2462, and assuming no outflow, the lake would only come up to 2467.25. I think we can forget about the weir equation. I am sure that the design of the embankment and the spillway was very conservatively done because most of the design procedures we use today did not exist when the work was done.

Respectfully submitted,

Morgan