



VIEW LOOKING UPSTREAM AT WASH
FROM ABOVE CULVERT



YIELD
FOR
PULSATING
WAVES

WAVE









VEHICLE IS STOPPED

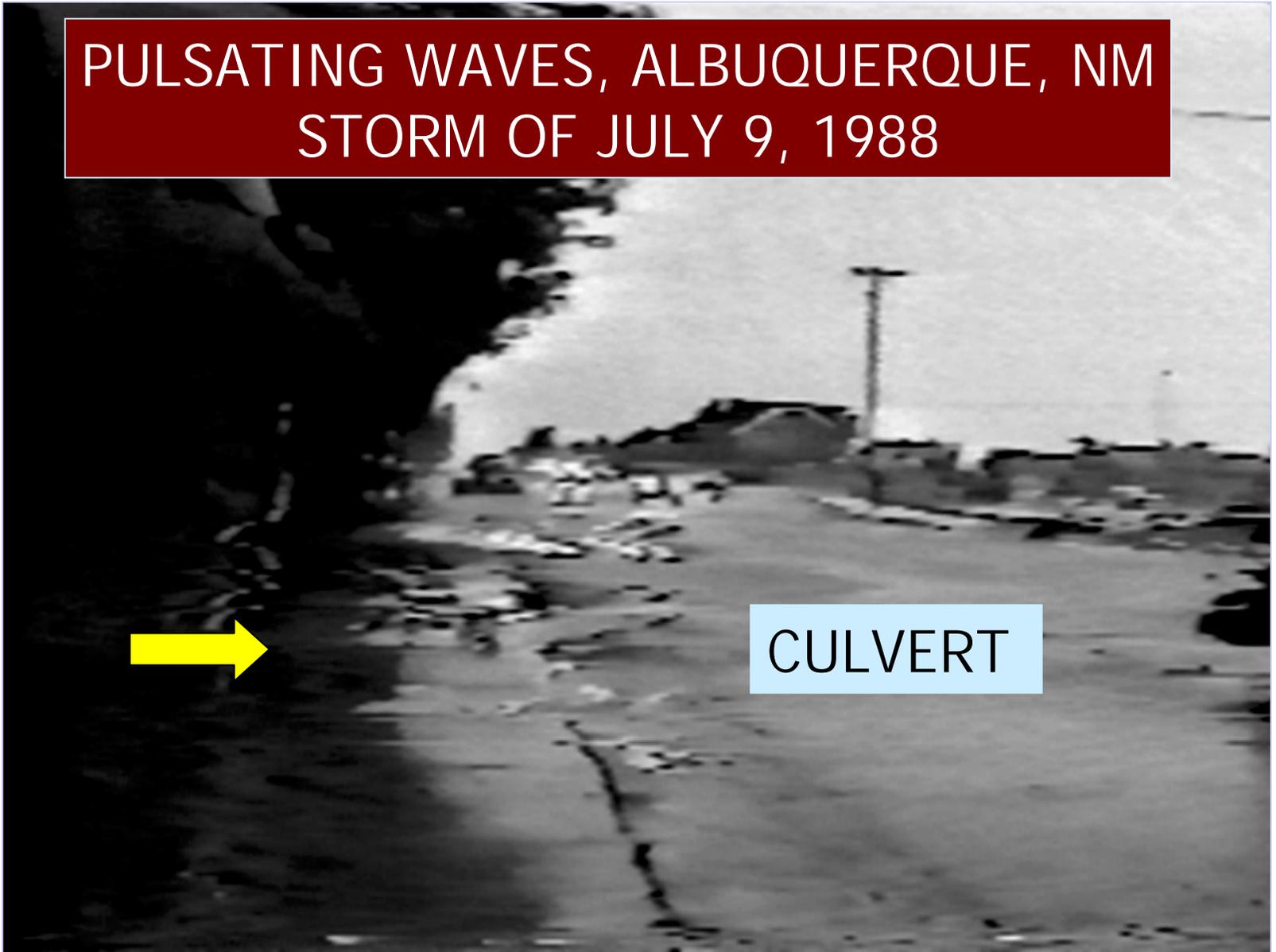


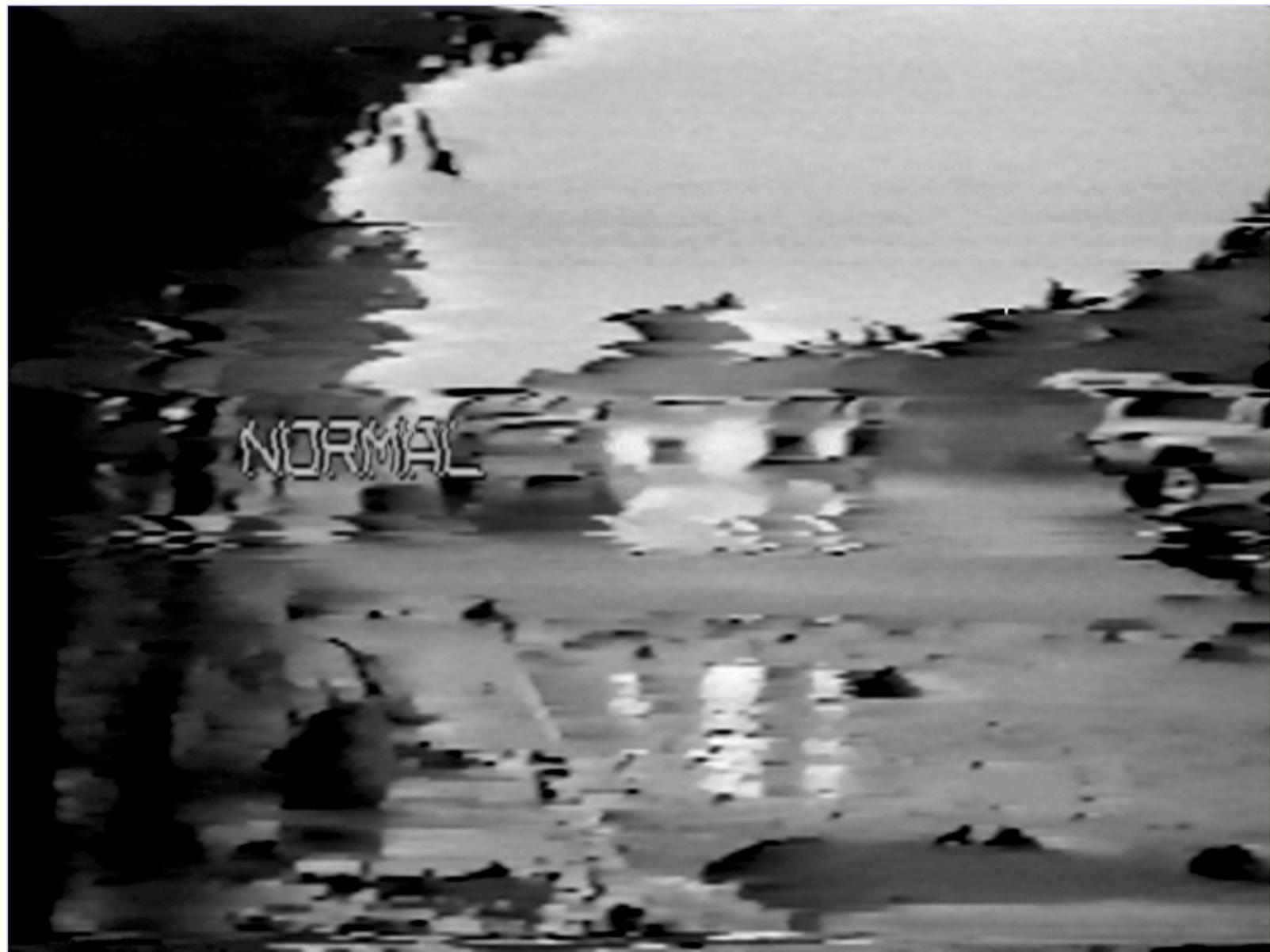


PULSATING WAVES, ALBUQUERQUE, NM
STORM OF JULY 9, 1988



CULVERT





NORMAL





PLAY

00:00:00



PLAY

00:00:00







PLAY

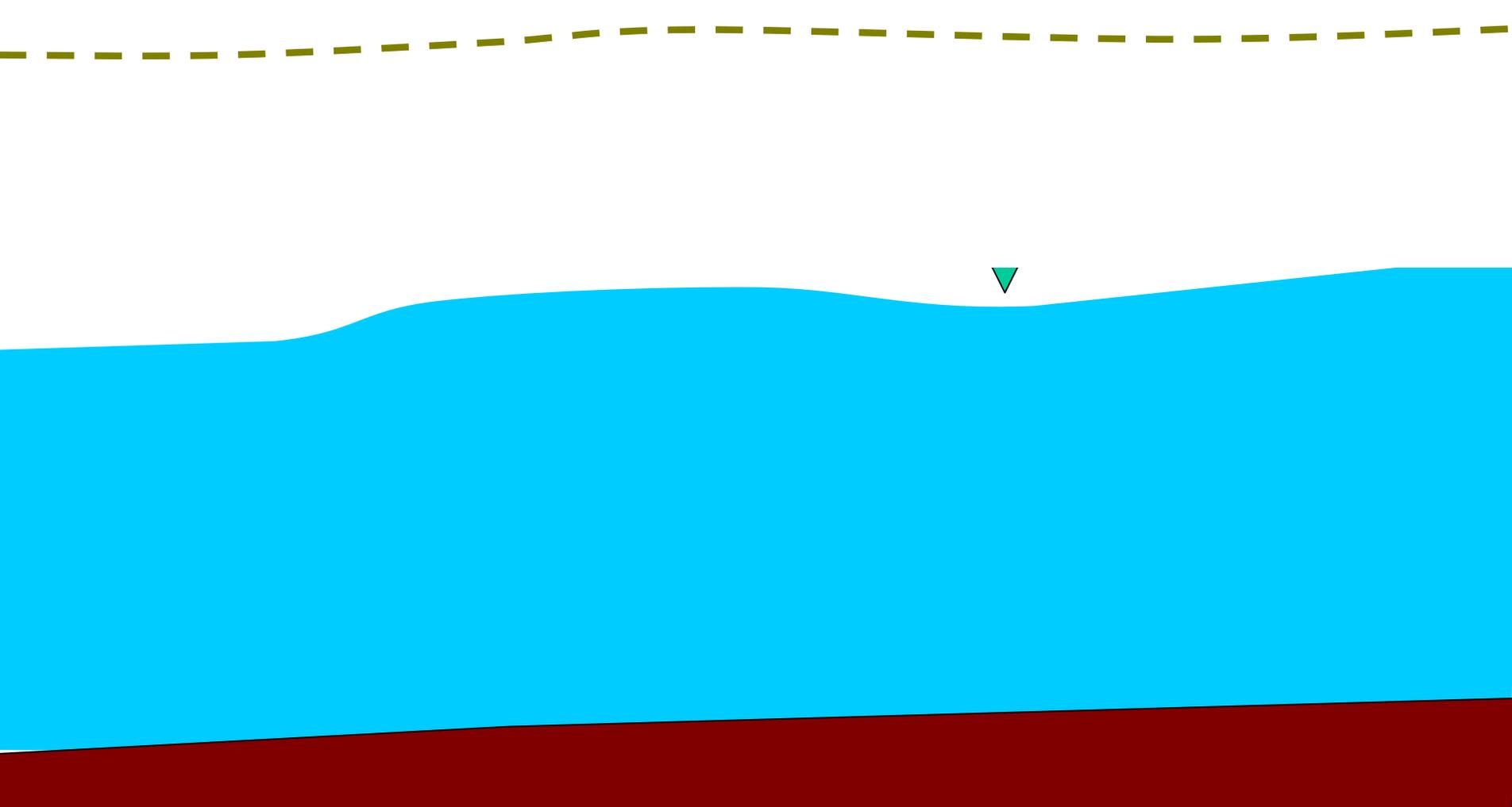
NORMAL



WAVES IN A NATURAL CHANNEL?

Pulsating roll waves

HWMs

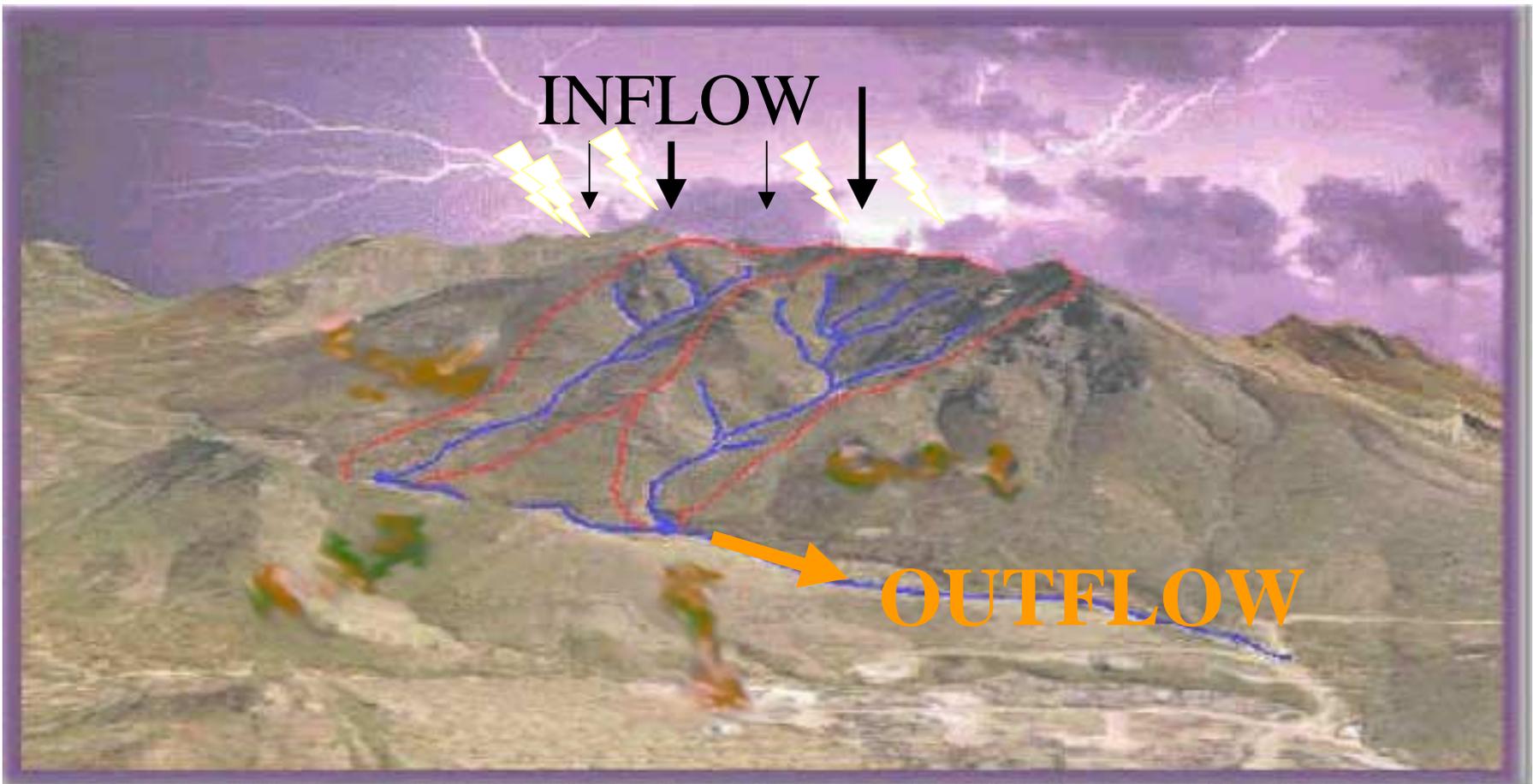


These waves would hit the bridge and splash across the bridge deck and roadway embankment at the south abutment.

Water overtopped the roadway and damaged the pavement.

LET'S TAKE ANOTHER
LOOK AT THE RAINFALL
FOR BRONCO CREEK.

OLD HYDROLOGISTS ESTIMATE PEAK DISCHARGE USING RAINFALL INTENSITY AND DRAINAGE AREA



FOR EXAMPLE

GIVEN:

19 mi² BASIN

RAINFALL OF 3 in/0.75 hr

NO STORAGE IN BASIN

NO RESISTANCE TO FLOW

OUTFLOW RATE = INFLOW RATE

FOR BRONCO CREEK BASIN

$$\text{AREA} = 19 \text{ MILE}^2 = 530,000,000 \text{ FEET}^2$$

ASSUME AVERAGE RAINFALL

$$= 3 \text{ INCH} / 0.75 \text{ HOUR} = 0.33 \text{ FEET} / \text{HOUR}$$

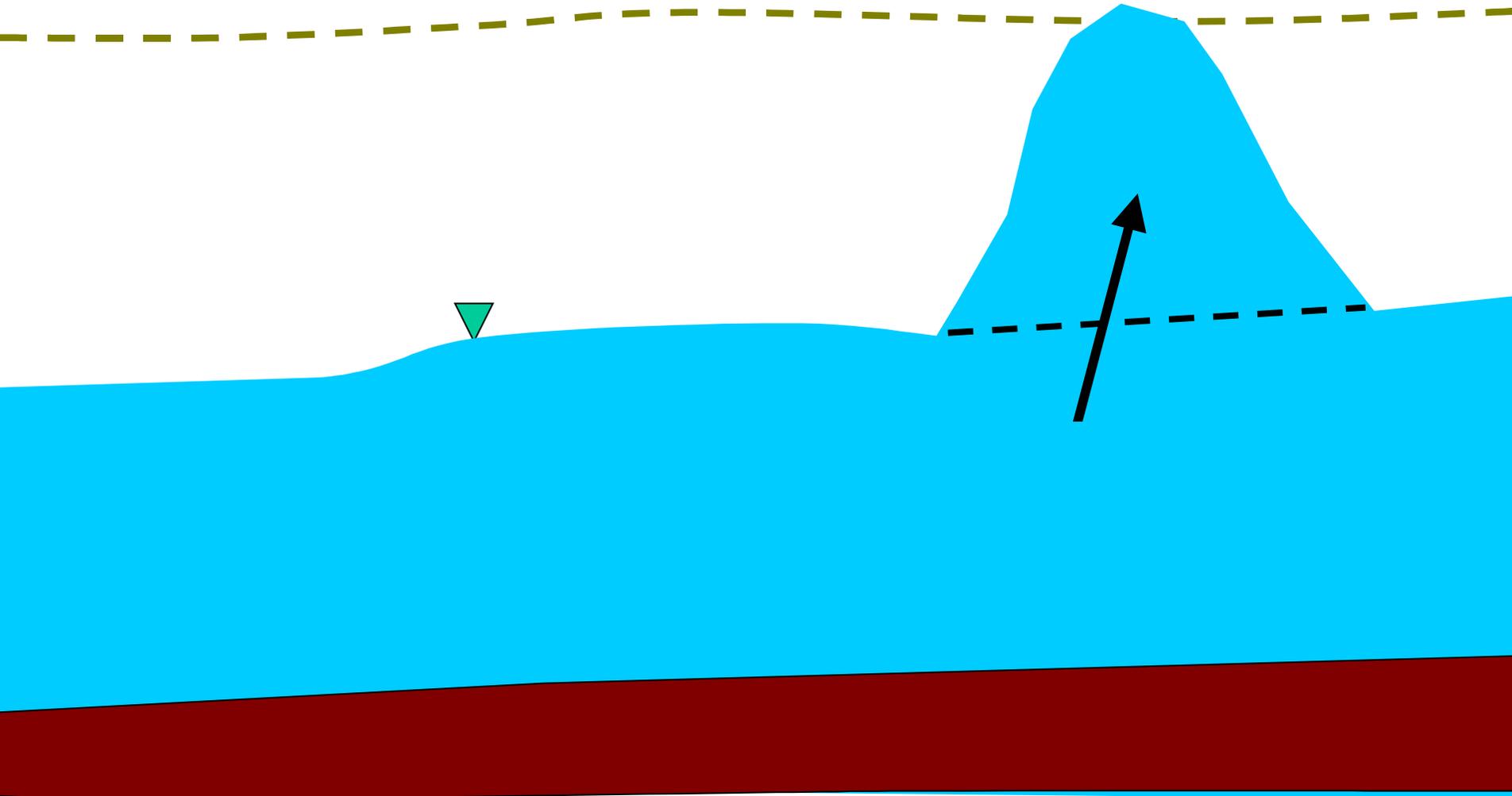
TOTAL RAINFALL RATE OVER BASIN

$$= .33(530,000,000) = 177,000,000 \text{ FT}^3 / \text{HOUR}$$

OR

$$49,000 \text{ FT}^3/\text{S}$$

HWMs



Is this an opportunity to
make progress?

An opportunity to advance
how we solve for peak
discharge?