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Techniques of Water-Resources Investigations
of the United States Geological Survey

Chapter A8

DISCHARGE MEASUREMENTS AT GAGING STATIONS

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Book 3

APPLICATIONS OF HYDRAULICS

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Meas. No. 264
Comp. by TJB
Checked by

DISCHARGE MEASUREMENT NOTES

Big Creek near Dogwood, Va.

Date Mar. 26, 1962 Party T. J. Buchanan
Width 140 Area 1,040 Vel. 8.16 G. H. *6.35 Disch. 8,490
Method 2-8 No. secs. 30 G. H. change +.90 in 1¼ hrs. Susp. 75C
Method coef. 1 Hor. angle coef. Varies Susp. coef. 1.00 Meter No. 3684

EST	GAGE READINGS			
Time	El. T	Recorder	Inside	Outside
1415	5.54	5.54	5.54	5.52
1440	Start	5.90*		
1500		6.14*		
1530		6.50*		
1555	Finish	6.80*		
1630	7.16	7.16	7.16	7.14
Weighted M. G. H.		6.35		
G. H. correction				
Correct M. G. H.				

Date rated 2-16-62 Used rating for rod ~ susp. Meter 1.0 ft. above bottom of wt. Tags checked
Spin before meas. 2:55 after 2:50
Meas. plots ____ % diff. from ____ rating
Wading, cable, ice, boat, upstr., downstr., side bridge 0.6 feet, mile, above, below gage, and
Check-bar, chain found
changed to ____ at ____
Correct
Levels obtained

Measurement rated excellent (2%), (good (5%)) fair (8%), poor (over 8%), based on following conditions: Cross section Fairly even; stone & gravel bottom
Flow Good distribution; some. Weather Raining
Other debris flowing Air 44 °F. @ 1635
Gage OK Water 38 °F. @ 1635
Record removed Yes Intake flushed U / L
Observer Talked with
Control Clear
Remarks * Gage height adjusted for time of travel of flood wave.

G. H. of zero flow ____ ft. Sheet No. 1 of 4 sheets.

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$$t = \frac{L}{1.3V} = \frac{3170}{1.3(8.16)} = 299 \text{ secs.} = 5 \text{ min.}$$

Figure 69.—Discharge measurement notes with mean gage height adjusted for time of travel of flood wave.

is not submerged. A weir is not submerged when there is free circulation of air on all sides of the nappe.

The general equation for flow over a sharp-edged triangular weir with a 90° notch is

$$Q = Ch^{5/2}, \tag{8}$$

where Q is the discharge, h is the static head, and C is the coefficient of discharge. Each weir should be rated by determining the flow volumetrically. In the absence of such a rating a value of C of 2.47 may be used.

To place the plate in a sand or silt channel, the only tools required are a carpenter's level and a shovel. The level is used to make the top of the plate horizontal and the plate plumb. Another way to level the plate is by fastening a staff gage or level bubble to each end of the weir. The staff gages are set at the same