

WASHINGTON DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
FRESHWATER MONITORING UNIT
STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 31B070
STATION NAME: Rock Creek at Old Hwy 8 Bridge
WATER YEAR: 2009
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Introduction

Watershed Description

The Rock Creek basin in south central Washington lies between the Bickleton Ridge in the north and the Goodnoe Hills in the south. The creek drains into Lake Umatilla on the Columbia River about three miles downstream from the gage. The basin above the gage drains approximately 217 square miles and includes range and agricultural lands with limited forest areas at higher elevations in the north. Elevation ranges from about 420 feet at the gage to 4730 feet along the ridge at the northern basin boundary. About five percent of the basin is covered by forest canopy. Annual precipitation averages 18 inches per year. Surface water generally flows in Rock Creek from November until July. A deep pool remains at the gage site year around.

Gage Location

The gage is about 18 miles southeast of Goldendale at the west end of the Old Highway 8 bridge, near river mile 3. The gage is on the right bank and measures water level in a deep year-round pool in the channel under the bridge. The Primary Gage Index is a staff gage mounted on the bridge abutment at the right bank near the gage house and slant pipe.

Table 1.

Drainage Area (square miles)	217
Latitude (degrees, minutes, seconds)	45 44 52
Longitude (degrees, minutes, seconds)	120 26 11

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	34 cfs
Median Annual Discharge (cfs)	3.4 cfs
Maximum Daily Mean Discharge (cfs)	347 cfs
Minimum Daily Mean Discharge (cfs)	0 cfs
Maximum Instantaneous Discharge (cfs)	491 cfs
Minimum Instantaneous Discharge (cfs)	0 cfs
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	117 cfs
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	0 cfs
Number of Days Discharge is Greater Than Range of Ratings	4 days
Number of Days Discharge is Less Than Range of Ratings	8 days

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

Flow started on 11/2/2008, and ceased on 7/14/2009. The eight days with discharge less than the range of ratings were known to have surface flow, but at a discharge less than 1 cfs. An additional 110 days had zero discharge with the water level below the measured point of zero flow. The time-weighted flow analysis found zero discharge during 30 percent of the year. The large number of days with zero flow skews the Median Annual Discharge downward to a value much lower than the Mean Annual Discharge.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	1%
Weighted Rating Error (% of discharge)	15%
Total Potential Error (% of discharge)	17%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	1	2	3
Period of Ratings	10/1/2008-10/24/2008	10/24/2008-1/15/2009	12/29/2008-9/30/2009
Range of Ratings (cfs)	0.12 to 610	0.55 to 610	0.0 to 610
No. of Defining Measurements	9	7	12
Rating Error (%)	13%	11%	16%

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

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Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

The minor fill between rating 1 and rating 2 can be attributed to leaf litter accumulated during the fall. The shift to rating 3 was more substantial and occurred during high flow events in early January.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	3.50 ft
Maximum Recorded Stage (feet)	10.82 ft
Range of Recorded Stage (feet)	7.32 ft
Number of Un-Reported Days	4 days
Number of Days Qualified as Estimates	8 days
Number of Days Qualified as Unreliable Estimates	None

Narrative

The four unreported days had discharge greater than twice the highest flows measured for the applicable ratings. The eight days qualified as estimates had mean flow estimated to be more than zero cfs, but not greater than 0.8 cfs.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	None
Range of Modeled Stage (feet)	N/A
Range of Modeled Discharge (cfs)	N/A
Valid Period for Model	N/A
Model Confidence	N/A

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date
None	N/A

Activities Completed

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