

## 015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA

Lower Susquehanna Basin  
Lower Susquehanna Subbasin

LOCATION.--Lat 39°58'38", long 77°08'34" referenced to North American Datum of 1927, Adams County, PA, Hydrologic Unit 02050306, 2.2 mi north of Heidlersburg.

DRAINAGE AREA.--10.2 mi<sup>2</sup>.

### SURFACE-WATER RECORDS

COOPERATION.--Station established and maintained by the U.S. Geological Survey in cooperation with the Pennsylvania Department of Environmental Protection, Bureau of Waterways Engineering.

PERIOD OF RECORD.--September 2000, September 2004 to current year.

REMARKS.--Restoration designs for impaired stream reaches frequently are based on the dimension, pattern, and profile of reference stream reaches that effectively accommodate streamflow and sediment without excessive channel erosion or deposition. Long-term data documenting stream-channel adjustments provide a basis to effectively assess the suitability of a particular reference reach for stream stabilization or other fluvial-geomorphology based projects. Approximately 1,000 feet of Bermudian Creek in Adams County, Pennsylvania (see map below) was selected as the first reference reach within the Pennsylvania Fluvial Geomorphic Reference Reach Network. The upstream end of this reference reach is located at of USGS station number 015738492 and is approximately 0.6 miles downstream of USGS streamgaging station 01573849.

The reference reach was initially surveyed in September 2000 (White, 2001) and again in September 2004 and July 2005 (Durlin and Schaffstall, 2005; Durlin and others, 2006) following methods described by Harrelson and others (1994) and Rosgen (1996). The data presented on the following pages were collected from a fourth survey completed in September 2006. Selected components of the reference-reach surveys are described in more detail below.

The longitudinal profile is a survey along the length of the stream displayed as if viewed from the side, or in profile. There are three components to the longitudinal profile; the water surface that would occur when the bankfull channel is flowing full (bankfull stage); the water surface at the time of the survey; and the streambed along the line of maximum depth and velocity (thalweg). Locations of surveyed cross sections are plotted on the longitudinal profile along with their respective distance along the reach (station). The slope of the water surface assigned to the longitudinal profile is 0.00680 feet per foot.

Cross-sections are surveyed perpendicular to the stream channel and are displayed as if looking in the downstream direction with station zero being located in the left overbank area. There are four components to the cross-section survey; the streambed, streambanks, and overbank areas (bed and bank surfaces); the water surface at the time of the survey; the water-surface elevation that would occur when the bankfull channel is flowing full (bankfull stage); and the water surface that would occur at twice the maximum depth of the bankfull channel (twice bankfull stage).

For additional information, contact Kirk White at the USGS Pennsylvania Water Science Center, Exton Office, 770 Pennsylvania Drive, Suite 116, Exton, PA 19341; 610-321-2434 (email [kewwhite@usgs.gov](mailto:kewwhite@usgs.gov)).

### REFERENCES.--

Durlin, R.R. and Schaffstall, W.P., 2005, Water resources data, Pennsylvania, water year 2004, v. 2 - Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-04-2.

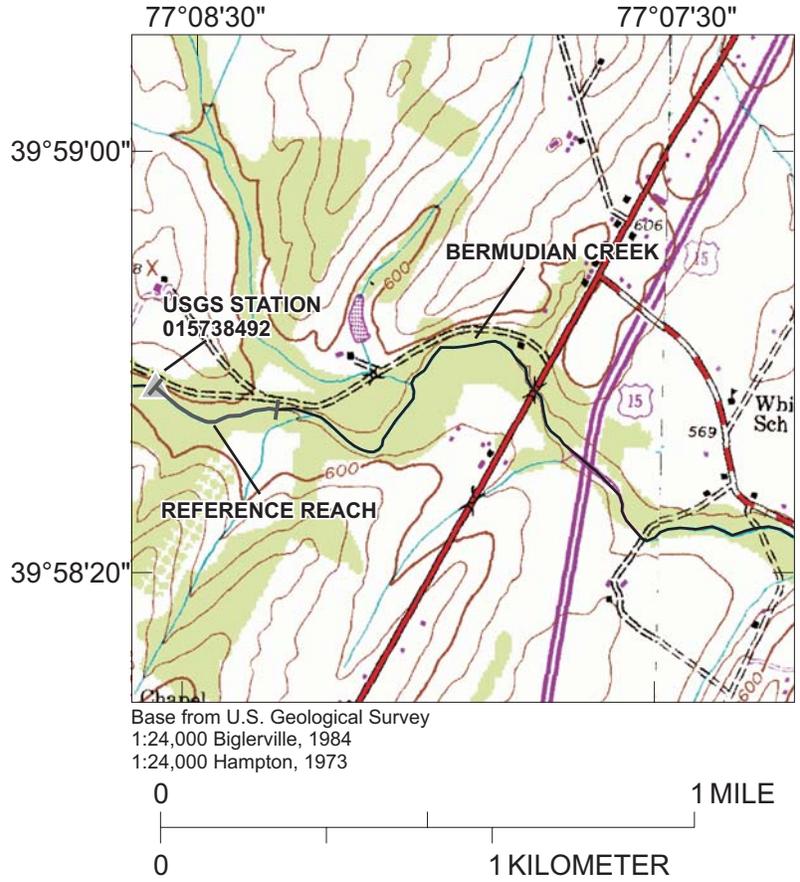
Durlin, R.R., Schaffstall, W.P., and Beaver, M.R., 2006, Water resources data, Pennsylvania, water year 2005, v. 2 - Susquehanna and Potomac River Basins: U.S. Geological Survey Water-Data Report PA-05-2.

Harrelson, C.C., Rawlins, C.L., and Potyondy, J.P., 1994, Stream channel reference sites - An illustrated guide to field technique: U.S. Forest Service, General Technical Report RM-245, 61p.

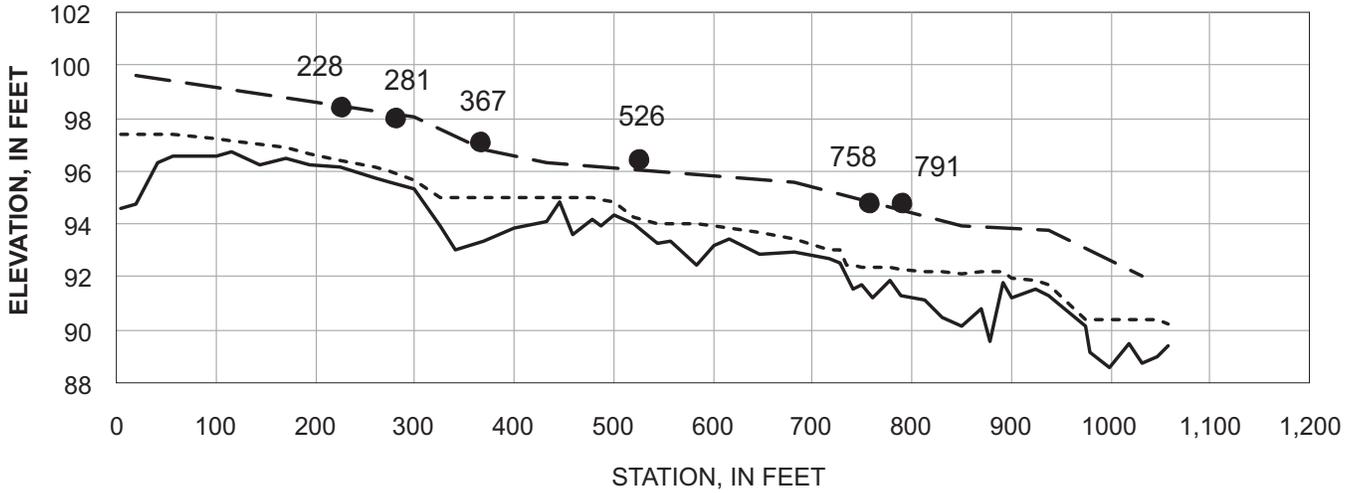
Rosgen, D., 1996, Applied river morphology: Minneapolis, Minn., Printed Media Companies, 352p.

White, K.E., 2001, Regional curve development and selection of a reference reach in the non-urban, lowland sections of the Piedmont Physiographic Province, Pennsylvania and Maryland: U.S. Geological Survey Water-Resources Investigations Report 01-4146, 20p.

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**BERMUDIAN CREEK LONGITUDINAL PROFILE**

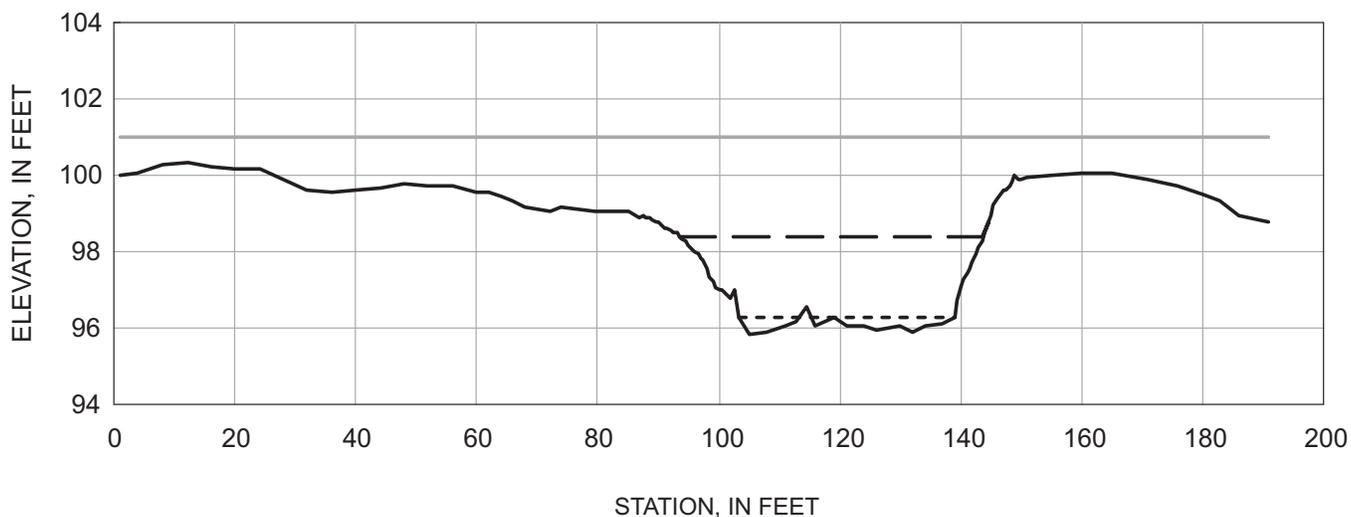


**EXPLANATION**

- THALWEG
- WATER SURFACE
- . - . - . BANKFULL STAGE
- 791 CROSS-SECTION LOCATION WITH STATION

015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA—Continued

BERMUDIAN CREEK CROSS SECTION STATION 228



EXPLANATION

BED AND BANK SURFACE     
  WATER SURFACE     
  BANKFULL STAGE     
  TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
228	Riffle	96.9	1.9	50.2	C3	64.0	146.7

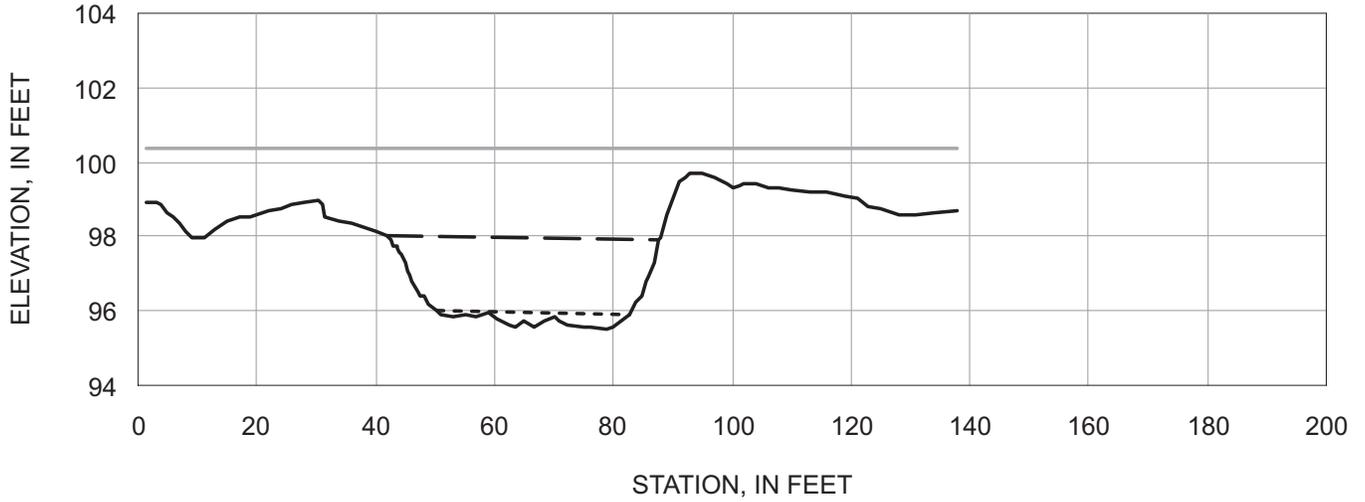
a. Rosgen, 1996.

b. D<sub>50</sub>, indicates 50 percent of particles have a medium axis less than or equal to reported value.

c. D<sub>84</sub>, indicates 84 percent of particles have a medium axis less than or equal to reported value.

015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA—Continued

BERMUDIAN CREEK CROSS SECTION STATION 281



EXPLANATION

BED AND BANK SURFACE     
  WATER SURFACE     
  BANKFULL STAGE     
  TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
281	Riffle	87.3	1.9	45.6	C4	48	104.1

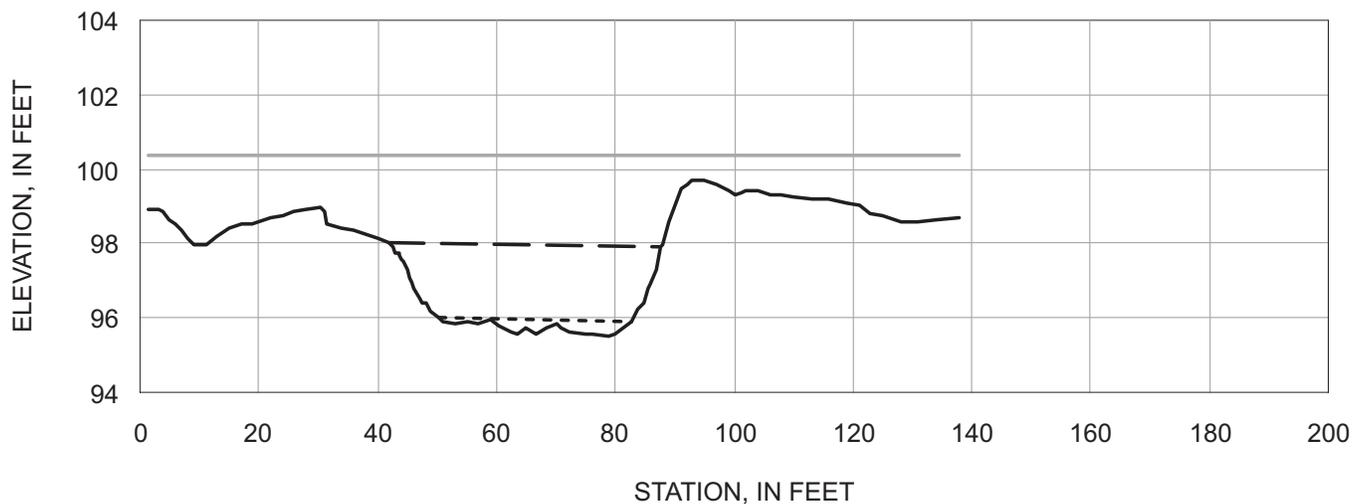
a. Rosgen, 1996.

b. D<sub>50</sub>, indicates 50 percent of particles have a medium axis less than or equal to reported value.

c. D<sub>84</sub>, indicates 84 percent of particles have a medium axis less than or equal to reported value.

015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA—Continued

BERMUDIAN CREEK CROSS SECTION STATION 367



EXPLANATION

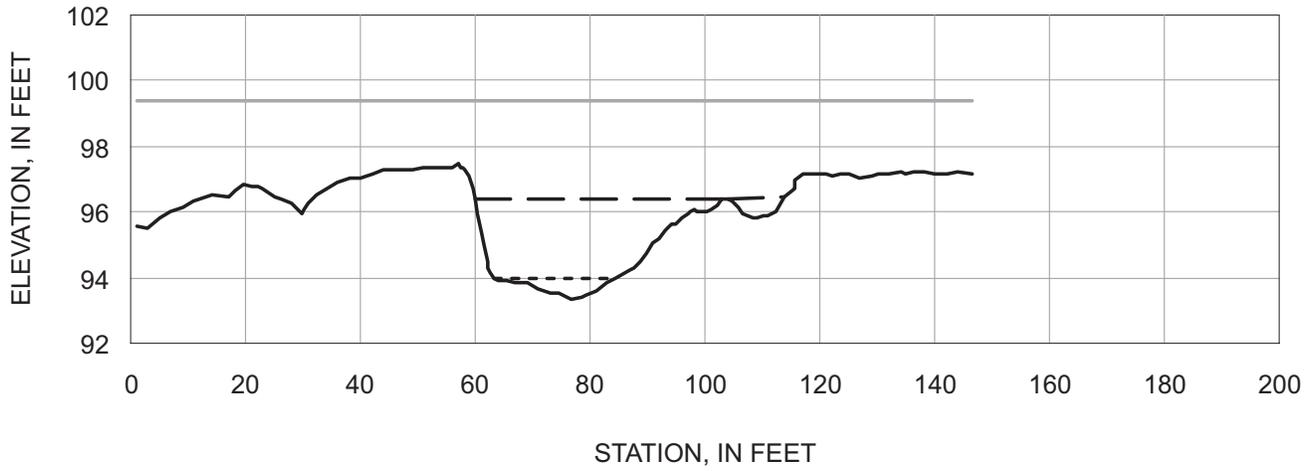
BED AND BANK SURFACE     
  WATER SURFACE     
  BANKFULL STAGE     
  TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
367	Pool	81.1	1.2	46.2	N/A	38.2	107.0

- a. Rosgen, 1996.
  - b. D<sub>50</sub> indicates 50 percent of particles have a medium axis less than or equal to reported value.
  - c. D<sub>84</sub> indicates 84 percent of particles have a medium axis less than or equal to reported value.
- N/A Not determined.

015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA—Continued

BERMUDIAN CREEK CROSS SECTION STATION 526



EXPLANATION

BED AND BANK SURFACE                      WATER SURFACE                      BANKFULL STAGE                      TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
526	Riffle	86	1.2	52.6	C4	44.5	113.3

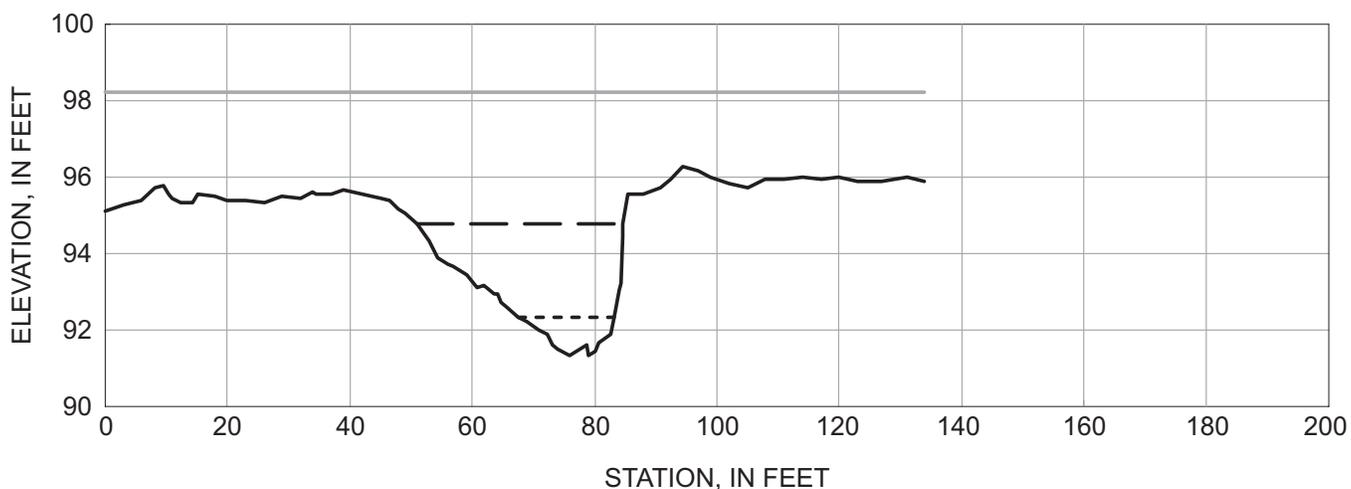
a. Rosgen, 1996.

b. D<sub>50</sub>, indicates 50 percent of particles have a medium axis less than or equal to reported value.

c. D<sub>84</sub>, indicates 84 percent of particles have a medium axis less than or equal to reported value.

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BERMUDIAN CREEK CROSS SECTION STATION 758



EXPLANATION

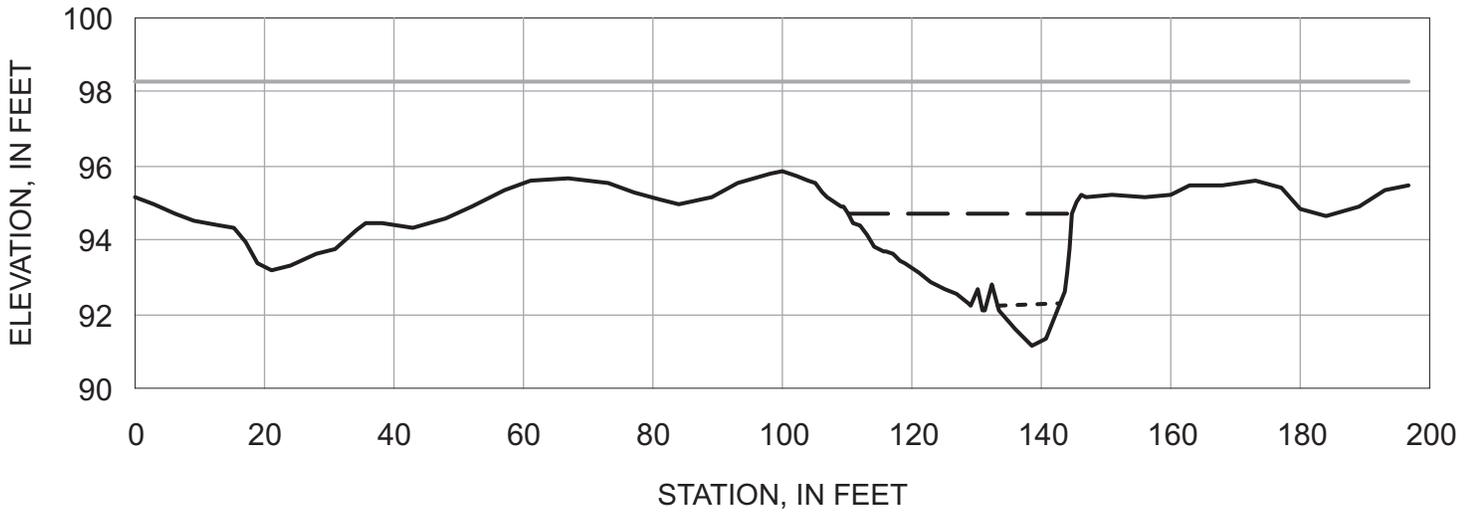
BED AND BANK SURFACE                      WATER SURFACE                      BANKFULL STAGE                      TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
758	Pool	72.5	2.2	33.6	N/A	55.4	127.5

a. Rosgen, 1996.  
 b. D<sub>50</sub>, indicates 50 percent of particles have a medium axis less than or equal to reported value.  
 c. D<sub>84</sub>, indicates 84 percent of particles have a medium axis less than or equal to reported value.  
 N/A Not determined.

015738492 BERMUDIAN CREEK AT WILLOW LANE NEAR HEIDLEBURG, PA—Continued

BERMUDIAN CREEK CROSS SECTION STATION 791



EXPLANATION

BED AND BANK SURFACE
 
 WATER SURFACE
 
 BANKFULL STAGE
 
 TWICE BANKFULL STAGE

Cross-section station	Cross-section type	Bankfull area (ft <sup>2</sup> )	Bankfull mean depth (ft)	Bankfull width (ft)	Stream type <sup>a</sup>	D <sub>50</sub> <sup>b</sup> (mm)	D <sub>84</sub> <sup>c</sup> (mm)
791	Pool	69.4	2.0	34.8	N/A	66.6	146.5

a. Rosgen, 1996.  
 b. D<sub>50</sub>, indicates 50 percent of particles have a medium axis less than or equal to reported value.  
 c. D<sub>84</sub>, indicates 84 percent of particles have a medium axis less than or equal to reported value.  
 N/A Not determined.