

Figure 7.--Profile of computed water-surface elevations for the 100-year flood, streambed elevations, and location of cross sections.

EXPLANATION
 - - - - - WATER SURFACE OF 100-YEAR FLOOD
 _____ STREAMBED
 (16) LOCATION OF CROSS SECTION AND NUMBER

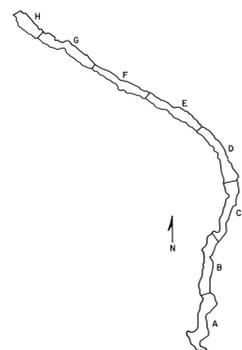


DIAGRAM SHOWING RELATIVE POSITION OF SEGMENTS OF THE PROFILE ALONG THE POPLAR RIVER

SUMMARY
 Standard hydrologic and hydraulic methods were used to analyze flood-hazard data for the Poplar River. The 100-year flood was selected as having special significance for flood-plain management.

Hydrologic analysis was used to determine the magnitude of the 100-year flood for a reach of stream extending from the mouth of West Fork downstream to Poplar. The flood magnitude was determined to range from 61,000 to 65,000 ft³/s, depending on location.

Data used to compile 55 channel and flood-plain cross sections were obtained from field surveys of a 37-mi reach of the river. The data also were used to calculate water-surface elevations for the 100-year flood at each cross section, using WSPRO, a step-backwater computer program.

The water-surface profile was drawn showing computed water-surface elevations of a 100-year flood. The flood profile also shows the streambed elevations and locations of bridges and cross sections used in the hydraulic analysis. Flood boundaries were delineated using the flood elevations determined at each cross section.

REFERENCES CITED

Omang, R.J., Parrett, Charles, and Hull, J.A., 1986, Methods for estimating magnitude and frequency of floods in Montana based on data through 1983: U.S. Geological Survey Water-Resources Investigations Report 86-4027, 85 p.

Shearman, J.O., Kirby, W.H., Schneider, V.R., and Filippo, H.N., 1986, Bridge waterways analysis model/research report: U.S. Geological Survey and Federal Highway Administration, Office of Research and Development, FHWA/RD-86/108, 112 p.

U.S. Environmental Data Service, 1971, Climate of Montana: Department of Commerce, National Oceanic and Atmospheric Administration, Climatology of the United States No. 60-24, 21 p.

U.S. Water Resources Council, 1981, Guidelines for determining flood flow frequency: Bulletin 17B, 27 p.

CONVERSION FACTORS

The following factors can be used to convert inch-pound units to metric (International System) units.

Multiply inch-pound unit	By	To obtain metric unit
cubic foot per second (ft ³ /s)	0.028317	cubic meter per second
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
square mile (mi ²)	2.59	square kilometer

Temperature in degrees Fahrenheit (°F) can be converted to degrees Celsius (°C) by the equation:

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Sea Level Datum of 1929."

Table 2.--Elevation reference marks

Ref-er-ence mark	Elevation (feet above NGVD of 1929)	Description of location
RM1	1,966.21	A standard U.S. Coast and Geodetic Survey benchmark disk, stamped "W542" and set in the southwest end of bridge crossing the Poplar River, is located 1.0 mi westerly along U.S. Highway 2 from the Fort Peck Tribal Headquarters in Poplar, 16 ft south of centerline of highway, and 3.4 ft east of west end of bridge.
RM2	1,966.72	A U.S. Coast and Geodetic Survey stainless steel rod underneath a 5-in. logo cap is located 0.2 mi easterly along U.S. Highway 2 from the Fort Peck Tribal Headquarters in Poplar, at the entrance of the Poplar Airport, 34 ft east of center of paved road leading to the Poplar Airport, 10.6 ft east of fence corner, and 1.4 ft south of chainlink fence.
RM3	1,969.08	A disk, stamped "Gaging Station" and set in top of right cable anchorage, is located 3.8 mi north of Poplar, along the Poplar River, at the U.S. Geological Survey streamflow-gaging station on right bank, 40 ft southwest of gage house.
RM4	1,981.86	Downstream crown of left 8-ft corrugated metal culvert is located at crossing along the Poplar River, 5.7 mi north of Poplar, at culvert on access road to local ranch.
RM5	2,035.37	Top of brass cap, stamped "191 1946" and set in top of iron section post projecting 0.5 ft above ground, is located 7.0 mi northeast of Poplar, along the Poplar River, on left bank, 0.5 ft north of fence line.
RM6	2,048.29	A disk, stamped "FAS 4183" and set in top of concrete post projecting 2.7 ft above ground, is located 11 mi northeast of Poplar, along Federal Aid Secondary Highway 251, 50 ft west of highway, 6.0 ft north of fence corner, and 35 ft south of gravel road.
RM7	2,037.00	Top of brass cap, stamped "54 53 59 510 1946" and set in top of iron section post projecting 0.7 ft above ground, is located 12 mi northeast of Poplar, along the Poplar River, on right bank, 200 ft north of river.
RM8	2,043.00	Top of center of steel cattle guard, 5.5 ft long and 15 ft wide, is located 13 mi northeast of Poplar, along the Poplar River, at township line of Tps. 29 and 30 N., on right bank, 1,400 ft west of river, and along fence line.
RM9	2,085.00	Top of brass cap, stamped "518 517 519 520" and set in top of iron section post projecting 0.6 ft above ground, is located 16 mi northeast of Poplar, along the Poplar River, at quarter corner of secs. 17, 18, 19, and 20, 800 ft south of river, along a power line.
RM10	2,105.02	Top of brass cap, stamped "2112" and set in top of iron post projecting 0.7 ft above ground, is located 16.5 mi northeast of Poplar, along the Poplar River, at quarter corner between secs. 13 and 18, on right bank, 1 ft east of fence line.
RM11	2,095.67	Top of brass cap, stamped "2103" and set in top of iron section post projecting 0.5 ft above ground, is located 18 mi northeast of Poplar, along the Poplar River, at corner of secs. 1, 6, 7, and 12, on left bank, along a power line.
RM12	2,093.71	Top of brass cap, stamped "2101" and set in top of iron section post projecting 0.2 ft above ground, is located 19 mi north of Poplar, along the Poplar River, at corner of secs. 1, 2, 38, and 36, on left bank, 27 ft south of fence line.
RM13	2,115.42	A standard U.S. Geological Survey aluminum disk, stamped "48 JBJ 1977" and set in concrete post level with the ground, is located 20 mi north of Poplar, along the Poplar River, 45 ft south of centerline of a gravel road, 1 ft south of fence, and 2.8 ft east of witness post.
RM14	2,180.71	A standard U.S. Geological Survey aluminum disk, stamped "49 JBJ 1977" and set in top of concrete post level with the ground, is located 21 mi north of Poplar along the Poplar River, 45 ft east of centerline of gravel road, 3.0 ft west of fence, and 3.0 ft west of witness post.
RM15	2,205.00	Top of brass cap, stamped "56 57" and set in top of iron section post projecting 1.0 ft above ground, is located 26 mi north of Poplar, along the Poplar River, on left bank, 2.0 ft west of quarter corner between secs. 6 and 7.
RM16	2,189.24	Top of brass cap, stamped "2196" and set in top of iron section post projecting 0.3 ft above ground, is located 27 mi northeast of Poplar, along the Poplar River, at township corner of Tps. 31 and 32 N., 84, 49 and 50 E., on left bank, 1.5 ft south and 1.0 ft west of fence line.
RM17	2,196.92	A standard U.S. Coast and Geodetic Survey benchmark disk, stamped "D286 1935" and set in top of concrete post projecting 1.0 ft above ground, is located 27 mi northeast of Poplar, along the Poplar River, at north quarter corner of sec. 2, 100 ft east of corner marker, and 16 ft east of centerline of trail.
RM18	2,169.17	A standard U.S. Coast and Geodetic Survey benchmark disk, stamped "C286 1935" and set in top of concrete post projecting 0.5 ft above ground, is located 28 mi northeast of Poplar, along the Poplar River, at southeast corner of sec. 27, on left bank, at junction of T-road leading north, 75 ft west of centerline of T-road, 29 ft north of centerline of east-and-west road, and 27 ft north of fence line.
RM19	2,234.42	Top of brass cap, stamped "1990" and set in top of iron section post projecting 0.5 ft above ground, is located 30 mi northeast of Poplar, along the Poplar River, at south quarter corner of sec. 22, on left bank, 1.0 ft south of trail.

Table 2.--Elevation reference marks--Continued

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For additional information write to:

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