PR116 NARRATIVE Updated 17 May 2014

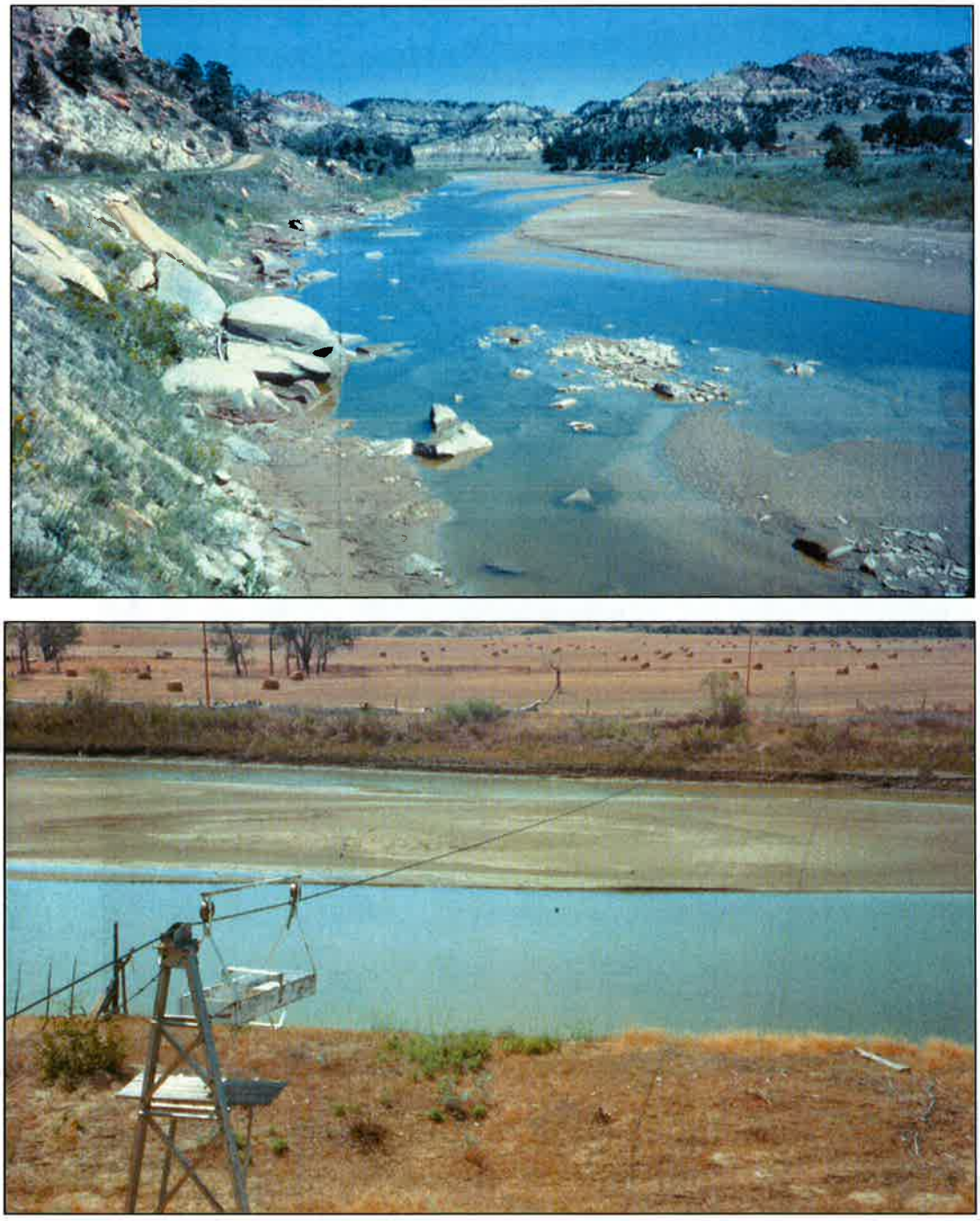
Cross section PR116 was installed in 1975 at the exact location of a cross-channel cableway that had been built earlier by the USGS Montana District for measuring water discharge at the gaging station, Powder River at Moorhead MT. Our intention in this 1975 installation was to be able to include previous measurements made here with those we intended to make ourselves in the coming years. Like many such USGS cableways installed on US rivers, this one's location was selected for its stability, so as to be able to develop, over the long term, a permanently stable relation between river stage and water discharge, and thereby produce a useful discharge rating curve. Section PR116 is, therefore, a "bedrock" section, which shows the least channel change with time.

In addition to its usefulness to USGS hydrologists during periods when river flows were swift and deep enough to preclude wading measurements of the velocity and depth of the water, the cableway also served at least one ranch lad (Hugh Fulton) when he wanted to visit a friend on the opposite bank of Powder River. The overhead cableway was dismantled in September 1988, but the concrete foundations for the cableway's pylons are still visible (and usable as section benchmarks) on both sides of the river.

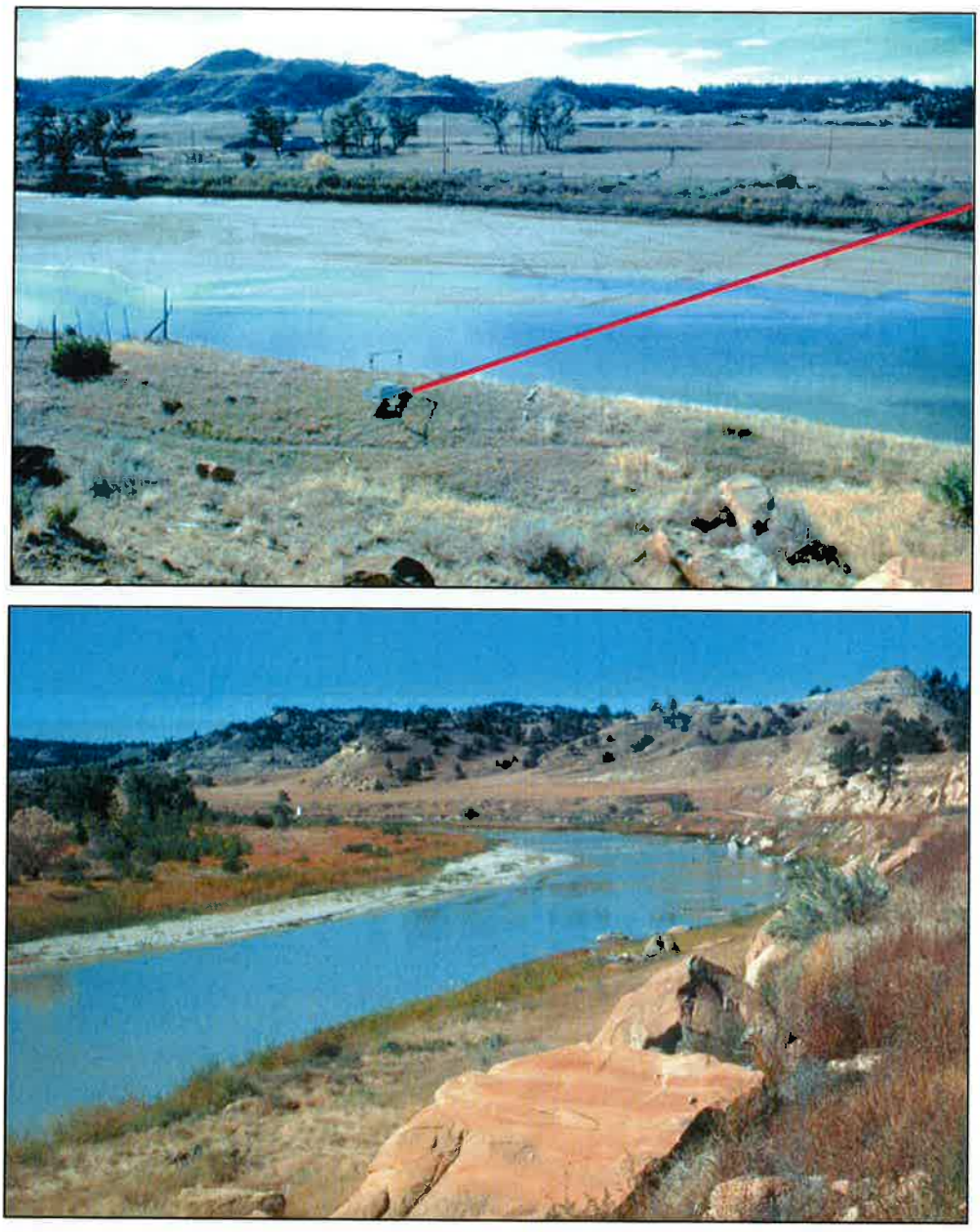
Leveling surveys re-measured the elevations every year from 1975 through 1998, with the exceptions of years 1976, 1981, 1982, and 1983. During the flood of 1978, the left-side terrace bank was eroded laterally1.8 m, while a 0.2- 0.7 m thickness of new sand was deposited over a 6-7-m width atop the left-side terrace, and a 0.3-0.4 m thickness of new sand was deposited atop the riverward edge of the right-side terrace (Meade and Moody, 2013, *their* Figure 16). The flood deepened the channel by 0.1-0.3 m, but these deepened spaces were soon refilled with sands during subsequent years.

During the two decades following the 1978 flood, annual resurveys showed how the active river bed varied between net deposition one year and net erosion the next, at rates of only a few decimeters of vertical change, either up or down, from year to year. During the same two decades, the left terrace bank was eroded back at an average rate of 0.1 m per year.

Meade, R.H., and Moody, J.A., 2013, Erosional and depositional changes wrought by the flood of May 1978 in the channels of Powder River, southeastern Montana: U.S. Geological Survey Scientific Investigations Report 2013-5035, 28 p., 1 pl.



PR116. **Top**. 21 July 1977. View is downriver from PR116, showing bedrock control of this exceptionally stable reach of Powder River. **Bottom.** 16 August 1986. View is from left bank and cableway is on section. Flow is to the left.



PR116. **Top**. 19 September 1988, about 10 days after removal of cableway. View is from above the left bank. Cable car is approximately on section shown by the red line. The gage site at PR116 was abandoned and moved upriver. Flow is toward the upper left. **Bottom.** 19 September 1989. View is upriver from left bank standing on PR116. The white cylindrical structure on the left bank upriver, left of the center of the photograph, is the old gage house for Powder River at Moorhead, Montana. New gage house is now at Moorhead Bridge, about 1.8 km upriver from the old gage house.

PR116. **Top**. 25 August 1993. Newly-deposited sand bench on right bank just downriver from PR116. Flow is from right to left.