

OUTSTANDING GEOLOGIC FEATURE OF PENNSYLVANIA

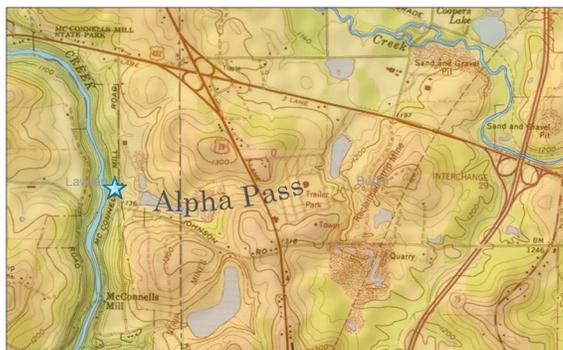
ALPHA FALLS, LAWRENCE COUNTY

Stuart O. Reese and Gary M. Fleegeer, 2016



Location

McConnells Mill State Park, Lawrence Co., Slippery Rock Twp.,
lat: 40.9605, lon: -80.1697; Portersville 7.5-minute quadrangle



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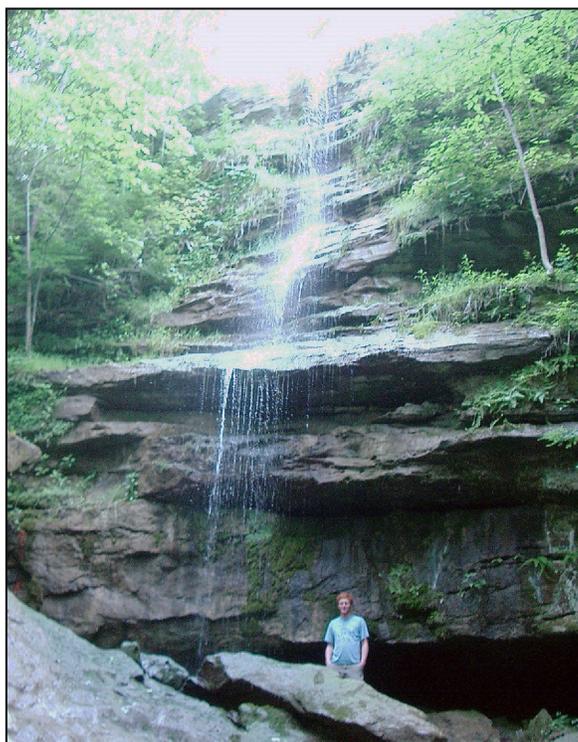


Geology

The 50-foot-tall Alpha Falls, also known as Gardiner Falls or Spillway Falls, marks the exit of a small stream from a “hanging valley” into the deeper [Slippery Rock Gorge](#). A hanging valley is one where the mouth of the tributary valley occurs on a cliff above a much deeper valley.

Prior to the formation of the gorge, outflow from glacial Lake Watts (current site of [Lake Arthur](#) in Moraine State Park) temporarily drained from Alpha Pass through this site. As the glacier further retreated, lower drainage passes were opened, leaving this valley with negligible flow. Almost none of the Homewood Sandstone has been eroded at the top of the falls, which suggests that the valley has not had much water flow since glacial lake drainage through it ceased and the gorge eroded deeper.

The falls formed after Alpha Pass was abandoned and outflow from glacial Lake Watts used the lower passes to Slippery Rock Creek, which continued to erode deeper. This left the mouth of the stream for Alpha Falls hanging 50 feet above the Slippery Rock Gorge floor. Numerous other waterfalls along the rim of the gorge formed in the same manner.



Alpha Falls at McConnells Mill State Park. Photograph by Richard Campbell, Pennsylvania Geological Survey intern.



Looking south from U.S. Route 19 at Alpha Pass, a low area between Bear Run to the east and Slippery Rock Creek to the west. Drainage is to the right (west) toward Slippery Rock Creek. Photograph by Gary Fleegeer, Pennsylvania Geological Survey.

Recommended Reading

Fleegeer, G. M., Bushnell, K. O., and Watson, D. W., 2003, Moraine and McConnells Mill State Parks, Butler and Lawrence Counties—Glacial lakes and drainage changes, *with an addendum on Muddy Creek oil field* by Carter, K. M., and Sager, Kelly (2010): Pennsylvania Geological Survey, 4th ser., [Trail of Geology 16-004.0](#), 18 p.

[McConnells Mill State Park](#) web page of DCNR.