NONPOINT SOURCE SUCCESS STORY

Pennsylvania

Treatment of Mine Drainage Improves Hubler Run

Waterbody Improved

Metals in discharges from abandoned coal mines impaired Pennsylvania's Hubler Run, prompting the Pennsylvania Department of Environmental Protection (PADEP) to add 1.40 miles of the mainstem stream to the state's Clean Water Act (CWA) section 303(d) list of impaired waters in 2005. PADEP developed a total maximum daily load (TMDL) and a watershed implementation plan to address the pollution sources entering Hubler Run. Project partners installed four passive treatment systems for a cost of over $720,000 to address the impacts of the mine drainage discharges entering the stream. Water quality and aquatic habitat have been improving, and the stream was removed from the impaired waters list in 2018.

Problem

The Hubler Run watershed drains approximately 1.05 square miles in Clearfield County in central Pennsylvania (Figure 1). This watershed is predominantly forested with some farmland, but it has experienced impairments from abandoned mine drainage (AMD) discharges from drift mines, informal openings where coal had been mined for household use, and some surface mining completed in the 1960s. Hubler Run is a tributary of Alder Run; according to the Alder Run Operation Scarlift report published in 1977, the stream's water quality was declining due to acidity and metals from AMD.

A stream survey conducted by PADEP indicated that Hubler Run was a degraded aquatic ecosystem with depressed aquatic life due to AMD impacts. As a result, PADEP included 1.40 stream miles of the main stem of Hubler Run on the state's 2005 CWA section 303(d) list of impaired waters for not meeting the aquatic life designated use due to low pH and elevated levels of metals.

PADEP developed a TMDL in 2006 to serve as a pollution diet for the Hubler Run watershed. The TMDL set limits for metal loading (aluminum, iron and manganese) systematically along stations on Hubler Run. These limits, which differ at each station based on the existing site-specific pollutant loads, served as goals for remediation.

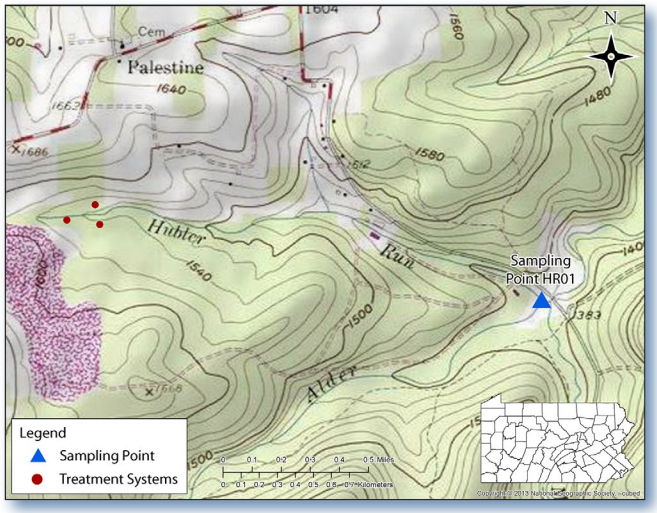

Figure 1. Hubler Run is in central Pennsylvania.

Story Highlights

The Emigh Run/Lakeside Watershed Association received a CWA section 319 grant in 2004 to assess the watershed. Using TMDL assessment data, project partners developed a watershed implementation plan for Hubler Run, which was approved in 2007. More than six AMD seeps were identified and sampled, and four priority areas were listed in the watershed implementation plan. Passive treatment systems composed of anoxic limestone drains and limestone leach beds have been constructed to address each of the four priority areas (Figures 2 and 3).

Figure 2. A passive treatment system installed at one of the four priority sites.

Figure 3. A buried anoxic limestone drain empties into a limestone channel.

Results

Monitoring has been occurring at the mouth of the stream at TMDL point HR01 since 2011. This point is downstream of the four constructed passive treatment systems. The TMDL data collected in 2005–2006 is considered the baseline. Data show that the treatment systems have improved water quality. For example, pH improved from a range of 4.1–5.7 in 2005–2006 (before treatment) to 6.65 in 2017 (after treatment). Additional data are shown in Table 1. As a result of these improvements, Hubler Run was removed from the list of impaired waters in 2018. Project partners attribute the improvements of water quality to the passive treatment systems installed to address the AMD discharges in this watershed.

Partners and Funding

Multiple stakeholders partnered to address the water quality problems in the Hubler Run watershed, including the West Branch Sportsman's Association; Alder Run Engineering, LLC; Emigh Run/Lakeside Watershed Association; Skelly and Loy, Inc.; Canaan Valley Institute; and PADEP. Emigh Run/Lakeside Watershed Association was awarded close to $700,000 from the CWA Section 319 Program, along with other funds from the Office of Surface Mining, the Foundation for Pennsylvania Watersheds and the Canaan Valley Institute, to construct the four passive treatment systems. It is estimated that these partners contributed an additional $60,000.

Table 1. Hubler Run data collected at TMDL sampling point HR01 before and after treatment.

Pollutants of Concern (in mg/L)	Pre-Treatment	Post-Treatment	TMDL Limit for HR01
Iron	Not detected	0.12	Not applicable
Aluminum	1.50	0.09	0.25
Manganese	3.40	0.56	0.47
Acidity	41.65	0.00	3.82

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-20-001J
May 2020

For additional information contact:

Kelly Williams
Clearfield County Conservation District
814-765-2629 • kwilliamsccd@atlanticbbn.net
R. Scott Carney
PA Department of Environmental Protection
717-783-2944 • rscarney@pa.gov