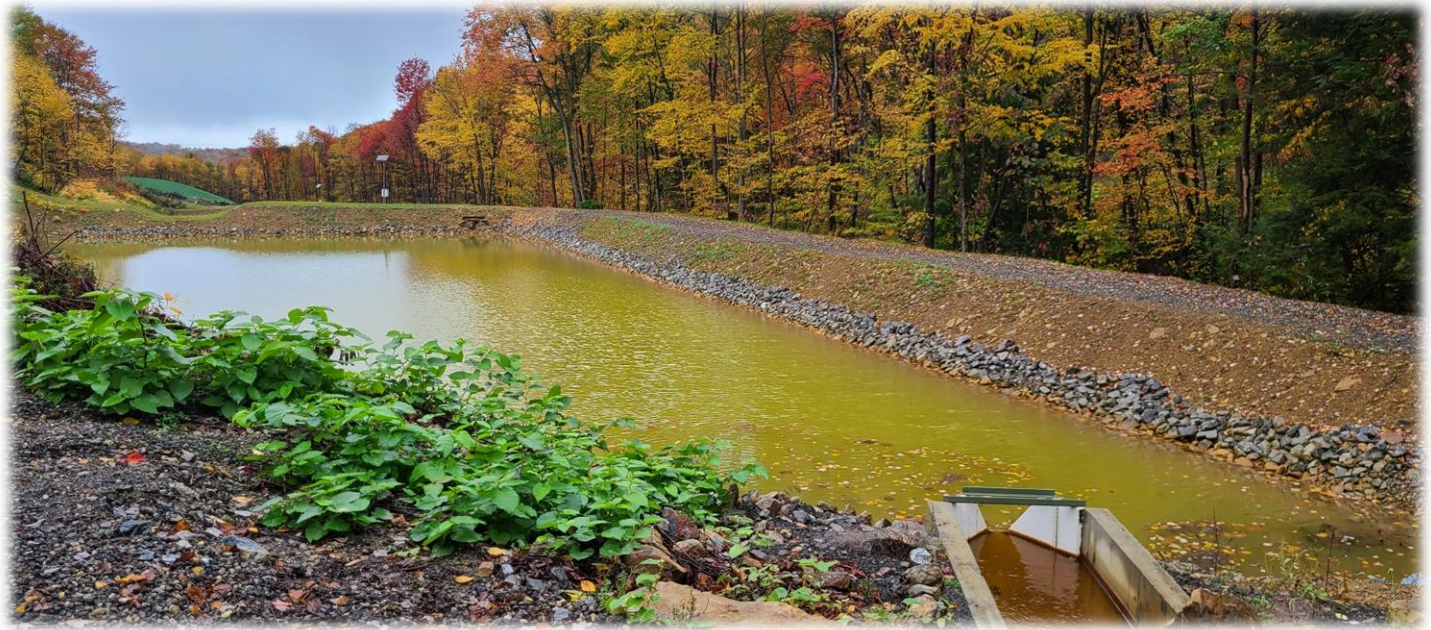


# Puritan AMD Full Treatment

## *A Trout Run Watershed Association Project*

Portage Township, Cambria County, Pennsylvania



Pictured above: TR4 discharge enters the Puritan Passive Treatment System through a 1.5-foot H-Flume into the Holding Pond. Solar-powered Agri Drain Smart Drainage Systems for the Holding Pond and Automatic Flushing Pond 1 seen in background. Bright green area in far background is a revegetated coal refuse removal area.

Stream Order: Trout Run→Little Conemaugh R.→Conemaugh R.→Kiskiminetas R.→Allegheny R.→Ohio R.

Project Sponsor: Stream Restoration Incorporated; System Design: BioMost, Inc. & Saint Francis University (SFU)

Problem: Acid Mine Drainage (AMD) from an abandoned underground coal mine degraded Trout Run.

Goal: Construct a passive treatment system capable of treating the full flow from the Puritan (TR4) discharge.

Project Description: Trout Run was degraded by the TR4 discharge that decreased the stream pH and alkalinity while increasing the acidity, iron, manganese, and aluminum. In addition to the AMD pollution, coal refuse eroded into the stream from numerous piles along Trout Run. BioMost, Inc. in cooperation with SFU developed an innovative passive treatment system that uses a first-of-its-kind automatic flushing Holding Pond (HP) to rapidly fill the first Automatic Flushing Vertical Flow Pond (AFVFP1) that contains 4,600 tons of high-quality limestone. As the pH is increased and the acidity neutralized by the limestone in AFVFP1, both iron and aluminum precipitate which are then flushed to Settling Pond 1 (SP1). Float switches installed in the HP and AVFP1 feed information to two solar-powered valves controlled by a unique Agri Drain Smart Drainage System that includes a timer to control the retention time in AFVFP1. A second 2,000-ton (AFVFP2) operates autonomously and in parallel with AFVFP1 to accept AMD when the flow is excess of 400 gallons per minute. Based on extensive bench scale testing performed by SFU, the system has the ability to completely neutralize acidity with as little as four hours of retention time which would permit the Puritan Passive Treatment System to provide meaningful treatment for up to about 1,500 gpm of AMD. The project was expanded to include the removal of four refuse piles by Robindale Energy Services, Inc. The stream is no longer degraded by TR4 with pH and alkalinity now increasing from upstream to downstream and meets in-stream criteria set forth by the Pennsylvania Department of Environmental Protection.

### **Project Partners**

PA Department of Environmental Protection, Bureau of Abandoned Mine Reclamation (\$641,504 Growing Greener Grant)| U.S. Office of Surface Mine Reclamation and Enforcement (\$100,000 WCAP Grant)| Foundation for Pennsylvania Watersheds (\$18,000 Grant)| Robindale Energy Services, Inc. (\$313,159 In-Kind; Coal Refuse Reclamation)| Saint Francis University (\$58,000 In-Kind; Monitoring & Design)| Stream Restoration Incorporated (\$58,186.27 In-Kind; Grant Administration)| BioMost, Inc. (\$64,846.05 In-Kind; Design, Permitting, & Construction)| Earth Shapers, LLC (Construction)| Angels Coal Trust, Cooney Brothers Coal Co., Donna Fisher & Scott Brunnet (Landowners)| Wenturine Bros. Lumber, Inc. (Site Access)| Cambria County Conservation District (Permit assistance)