

**Bear Run Phase 1 Passive Treatment System**  
**SRI O&M TAG Project #10 Request #2**  
**OSM PTS ID: PA-306**

Requesting Organization: Indiana County Conservation District  
Receiving Stream: Unnamed Tributary to Bear Run  
Watershed: Bear Run  
Municipality/County: Banks Township, Indiana County.  
Latitude/ Longitude: 40°51'46"N / 78°50'53"W

In 2008, the Bear Run Phase 1 Passive Treatment System was constructed on PA State Gamelands No. 174 to treat an abandoned underground mine discharge in Banks Township, Indiana County, PA. The original passive system was designed by Eric Robertson of the Pennsylvania Association of Conservation Districts (PACD) and consists of a multi-cell wetland with a primary focus on removing metal oxides. The Evergreen Conservancy and the Indiana County Conservation District (ICCD) have monitored and maintained the system since installation.

In the summer of 2014, Stream Restoration Inc. (SRI) was contacted by Adam Cotchen of ICCD concerning the Bear Run Phase 1 system, which was experiencing a pipe clogging issue, which has been an on-going problem at the site. Technical assistance had previously been provided under O&M TAG 1 (Project 10-1) in 2012. Adam reported that the group had been maintaining the pipe on their own utilizing a clean-out tool, but believed that a power snake was needed. On 11/6/14, Ryan Mahony and Daniel Guy of BioMost Inc. (BMI) met with Adam Cotchen of the ICCD to address the issue. A power snake supplied by BMI was used to successfully clean the obstruction from the pipe. The shallow wetland Cell B was overgrown with vegetation near the grate inlet. After snaking the pipe, the grate was cleared to increase flow. Efforts were made to increase flow toward the grate, but Adam expressed the need for the vegetation to be cleared from the wetland to have water continue to flow through the system instead of short-circuiting to the emergency spillway.

Shortly after snaking the pipe, township personnel graciously donated their time and equipment to remove the vegetation. Unfortunately, during the excavation some of the vegetation, iron, and other debris fell or flowed into the pipe and plugged the pipe once again. SRI was informed of the situation and BMI returned to the site on 12/10/14 to snake the pipe out again. The probable cause for the pipe continuing to plug are the utilization of at least four elbows that are used in the 200' long run of pipe that conveys the AMD under the road from Cell B to Cell C. Items such as sticks, leaves, sludge etc., can easily get caught in the elbow, which can then trap other similar materials and eventually become completely plugged.

On 8/5/15, Adam contacted SRI to report that the pipe was clogged again. As this was a frequently occurring problem, in December 2015, Tim Danehy, Daniel Guy, and Ryan Mahony met with Adam Cotchen and Tom Clark from the Susquehanna River Basin Commission to develop a more permanent

fix to flow issues. A power snake was used again to attempt to clear the blockage within the wetland outlet pipe. In addition to the power snake, the pipe was also backflushed using a 3" pump to help clear any remaining blockages. After draining overnight, the wetland water elevation was low enough to work on the outlet box. The inlet structure was then modified utilizing PVC pipe and fittings to try to reduce debris from entering the pipe and provide a backup inlet if the primary inlet were to plug. With the addition of this inlet structure, as well as clearing the area around it of any sediment, frequency of maintenance is expected to be reduced.

While on site, additional maintenance items and improvements were completed. Excess vegetation was cleared from wetland Cell A and Cell B to reduce short-circuiting, increase retention time, and expand capacity. The Cell A emergency spillway was located and cleared of sediment to allow for future use if needed. The drain/flush/bypass valve at Cell A was exercised to make sure it still functioned. The outlet of the pipe that conveys water from Cell B to Cell C has typically been underwater, which made finding the pipe and completing maintenance difficult and was likely reducing the velocity of the water flowing out of the pipe which could be contributing to the plugging issue. To lower the water elevation within Cell C, the spillway was cleaned and lowered. Vegetation and sediment was also removed from other spillways within the system.

#### **Additional Recommendations & Considerations:**

- Continue to conduct site inspections and water quality monitoring on a quarterly basis (minimum). Include field parameters of pH, iron, and flow rate at a minimum. Alkalinity is also recommended. Iron measurements in particular will be useful for indicating treatment issues for this particular system.
- Remove iron sludge and other materials from around the concrete inlet box as necessary to decrease materials entering the inlet pipe. This could be accomplished with a pump.
- Monitor the level of material built up in the settling basin around the box and clean as needed.
- Monitor intake riser pipe to ensure flow continues to enter the pipe.



On multiple occasions, the inlet box and pipe plugged at the Bear Run Phase 1 Passive Treatment System causing the water level to rise in the wetlands. BioMost, Inc., worked with volunteers from the Indiana County Conservation District, Evergreen Conservancy, and the Susquehanna River Basin Commission to unplug the pipe (Top Left & Right). The inlet structure was modified by installing a riser pipe to reduce clogging (Center Left & Right). While on site, spillways were cleaned and the outlet of Cell C was lowered (Bottom Left).