

SR81 Passive Treatment System
SRI O&M TAG Project #46 Request #1
OSM PTS ID: PA-118

Requesting Organization: Pennsylvania Game Commission & SRWC
Receiving Stream: Slippery Rock Creek
Watershed: Slippery Rock Creek Watershed
Municipality/County: Washington Township, Butler County
Latitude/Longitude: 41°5'54"N / 79°51'34"W

The SR81 discharge emanates from an abandoned deep mine that is being treated with a passive system consisting of an Anoxic Limestone Drain (ALD), Settling Pond, and Aerobic Wetland that was constructed in 2002. In May of 2016, the Pennsylvania Game Commission (PGC) contacted the Slippery Rock Watershed Coalition (SRWC) to set up a day to visit passive treatment systems located in PA Gamelands #95 to review their status and identify O&M issues. During the site investigation, water was found to be backed up and overtopping the berm of settling pond. The ALD pipe was also underwater so flow was not able to be measured. The cause was believed to be a build-up of iron sludge, sediment, and vegetation within the wetland, especially in the outlet channel and where the internal directional berms narrow the flow path.

As a result of the site visit, the SRWC requested assistance to conduct maintenance on the SR81 system. BioMost, Inc (BMI) performed a site investigation on 02/18/2017. On 2/27/17, a mini-excavator was used to create flow paths within the wetland by removing excessive vegetation growth especially at the outlet and other strategic locations within the wetland. This allowed more water to flow through the system and lowered the water elevation within the system. Low spots along the berm where the water had been overflowing were raised using on-site material. It is anticipated that this will be a short-term solution. Within the next few years, it is anticipated that approximately 2-3' of material will need be removed from the 28,000 SF wetland. While the wetland is being cleaned, it is also recommended to remove 2-3' of iron sediment from the 12,000 SF settling pond.

Water monitoring data was reviewed. During the initial system construction, significantly more water was encountered and directed to the ALD, which has essentially overwhelmed the system from the first day of operation. While the system typically produces water with significant alkalinity and circum-neutral pH, it has rarely been measured as net-alkaline. Alkalinity measured at the ALD outlet on 02/18/2017 was 64 mg/L, which is significantly lower than the average and median values over the life of the system. Monitoring conducted during the 2015 snapshot indicated the system was producing net-alkaline water on that date and metal concentrations were significantly reduced.

While the system has not yet failed, the SRWC should begin to plan for rehabilitation including replacing the limestone and removing sludge and debris from the settling pond and wetland. A location to place the material will need to be found. If the material needs to be trucked off site and placed in a landfill, the cost could be excessive. There may be a location nearby where a sludge pond could be constructed, but the SRWC will need to work with the PGC to obtain permission and identify a location. If possible, the system should be expanded including enlarging the size of the ALD to produce

net-alkaline water. Expansion of the wetland would also be beneficial. Another snapshot is planned for 2018 which will be used to further assess the effectiveness of the treatment system.



Top Left: A buildup of vegetation and sediment within the wetland was backing up water into the settling pond and overtopping the ALD effluent pipe.
Top Right: The wetland berm was built higher to temporarily prevent over-topping.
Bottom Right: Vegetation was removed from strategic locations in the wetland to encourage flow and lower the water elevation.