

McCaslin Road Passive Treatment System
SRI O&M TAG Project # 17 Request #1
OSM PTS ID: PA-150

Requesting Organization: Montour Run Watershed Association (in-kind partner)
Receiving Stream: West Fork of Enlow Run (Montour Run)
Hydrologic Order: West Fork of Enlow Run→Enlow Run→Montour Run→Ohio River
Municipality/County: Findlay Township, Allegheny County
Latitude/ Longitude: 40°29'30.9984"N / 80°17'26.0016"W
Construction Year: 2009

The Montour Run Watershed Association (MRWA) installed the McCaslin Road Passive Treatment System in 2009 to treat an acidic, metal-bearing, discharge from the abandoned Clinton Lake underground coal mine in Findlay Township, Allegheny County, PA. The passive system located on Findlay Township Public Works property consists of an Auto-Flushing Limestone-Only Vertical Flow Pond (AFVFP), a settling pond and a treatment wetland. On 5/15/12 during the 2012 Passive Treatment Snapshot, the effluent of the treatment system was found to be of poor quality indicating a decline in treatment efficiency. (Refer to the following table.) The system was checked again in August of 2012 and was still not functioning to expectations. The suspected cause was coating and/or plugging of the limestone aggregate by aluminum solids.

After discussion with project partners, the MRWA requested assistance to stir and “wash” the limestone aggregate within the AFVFP to restore functionality of the system. In September 2012, the medium within the AFVFP was stirred by BioMost, Inc., (BMI) and flushed to remove precipitates. During the maintenance activities, Public Works Director John O’Neal made an effort to watch and learn about the stirring process in order to assist the MRWA in the future.

Stirring of the AFVFP significantly improved the functionality of the treatment system. The table below provides water quality data including the average data for the raw discharge (MP5), the average water quality for effluent of the system (SPWL) and the water quality effluent of the system on 5/15/12 and 12/4/12. As can be seen, on 5/15/12 the final effluent had a low pH, was net-acidic with high concentrations of aluminum compared to the typical quality being net-alkaline with low aluminum. A sample collected on 12/4/12 following maintenance had a good pH, was net-alkaline, and had very low metal concentrations. A dissolved metals sample was also collected on 12/4/12 which shows that the 1.0 mg/L of aluminum was mostly in the solid form as the dissolved content was 0.2 mg/L. Additional data is available on *Datashed.org*.

McCaslin Road PTS Water Quality Data

Sample Point	Date	pH	Alkalinity (mg/L)	Acidity (mg/L)	TFe (mg/L)	TMn (mg/L)	TAI (mg/L)	SO ₄ (mg/L)
Raw	(Avg)	3.4	0	238	4.6	7.9	30.0	764
SPWL	(Avg)	6.4	38	-5	0.2	4.7	4.5	742
SPWL	05/15/12	4.3	0	113	0.4	5.2	20.9	587
SPWL	12/04/12	6.2	22	-8	0.4	3.9	1.0	682

Additional data available on Datashed.org

Additional Recommendations & Considerations:

- Conduct site inspections and water quality monitoring on a monthly basis is recommended. Include field measurement of pH at a minimum and alkalinity, iron, and flow rate as feasible.
- The limestone aggregate within the AFVFP will likely need to be cleaned and stirred every 3-5 years.
- Evaluate cleaning of the limestone aggregate when the pH of the final effluent is below ~6 at normal flow conditions.

The project team thanks the Montour Run Watershed Association, John O'Neil, and the Findlay Township maintenance staff for their support of this project as well as continuing to offer assistance for future rehabilitation and maintenance efforts. Funding for technical assistance and maintenance was provided by the PA DEP's Growing Greener and the Foundation for Pennsylvania Watersheds grant programs and in-kind volunteer services from the watershed association.



Poor effluent quality at the McCaslin Road PTS indicated the need for maintenance. In September 2012, the aluminum- and iron-coated limestone aggregate (*bottom*) in the Auto-flushing Limestone-only Vertical Flow Pond was cleaned using a small excavator to handle and to stir the limestone aggregate while using a pump to wash off the coating (*top*). The sludge material that was removed from the limestone aggregate was then flushed into the settling pond.

