Richards Passive Treatment System
SRI O&M TAG Project #36 Request #2
OSM PTS ID: PA-29

Requesting Organization:	Blacklick Creek Watershed Association
Receiving Stream:	South Branch Two Lick Creek
Watershed:	Blacklick Creek
Municipality/County:	Cherryhill Twp., Indiana Co.
Latitude/Longitude:	40°39’ 49"N / 78° 58’ 5”W

The Richards Passive Treatment system complex was designed by VAPCO Engineering and constructed in 1999 to treat an abandoned mine discharge from the sealed Egypt Mine, which was discharging to the South Branch Two Lick Creek. An inlet structure collects the mine drainage flowing out of the underground mine, which is then conveyed by pipe under SR-403 and split between two passive systems known as Richards 1 and Richards 2. Richards 1 contains a VFR followed by a settling pond. Richards 2 consists of two VFRs (2A and 2B) which both discharge into a settling pond and wetland complex. There is also a flush pond for VFR 2A and 2B. Sometimes the Richards treatment system has been considered as 3 separate passive systems known as Richards 1, Richards 2A, and Richards 2B.

In September 2016, Dennis Remy of the Blacklick Creek Watershed Association contacted Stream Restoration Incorporated (SRI) for additional assistance at the Richards system. Maintenance was previously conducted in 2015 through the O&M TAG program. Dennis reported that while VFR2A and 2B were functioning well, the water quality emanating from VFR1 was not good.

In May 2017, BioMost Inc. (BMI) returned to the site to conduct maintenance. VFR1 was allowing very little flow through the media, and VFR2A and 2B were at a much higher water elevation than designed. The flush valves for 2A and 2B were opened to allow the ponds to drain. Once drained, the ponds were stirred using a mini excavator to improve permeability of the media. It was discovered that there was a relatively uneven mixture of compost and limestone within each pond, with pond 2B having a higher limestone content than pond 2A. Both ponds appeared to have a layered media design with a compost mixture on top of a limestone layer.

VFR1 was also drained with the intention of stirring the media. The treatment media only had approximately 6-12 inches of compost with no observable limestone. In conjunction with the iron precipitates on top of the media, it was not possible to effectively stir the media without causing damage to the liner or the piping system presumed to be underneath the media. Due to the lack of permeability of the media in pond 1, the inlet pipe was temporarily capped until a more permanent solution could be found to utilize the pond. Flow which would normally enter VFR 1 is now diverted to VFR2A and 2B.

After stirring the ponds, it was found that some sort of blockage existed within the raw water conveyance pipe. After exercising the valves for both VFR2A and 2B and attempting to snake the pipes manually, the clog within the piping appeared to let loose and allow free flow from the inlet. To

reduce the chance of plugging in the future, a bar guard was installed at the concrete box inlet structure pipe elbow.

Stream Restoration Inc. and BioMost, Inc. would like to thank the Blacklick Creek Watershed Association for their volunteer time and support in maintaining the Richards passive treatment system. Funding for technical assistance and maintenance was provided by the PA DEP's Growing Greener grant programs and in-kind services by project partners.

Additional Recommendations & Considerations:

As the passive system is nearly 20 years old and the media within VFP1 appears to be spent, the BCWA should consider obtaining funding for a system redesign in the near future especially if water quality does not improve after recent maintenance. When the system is rehabilitated, Settling Pond #1 should be lined.

Left: VFR 2A and 2B had layered media which benefitted from the top layer being stirred to improve permeability.
Top Right: VFR 2A after being stirred.
Bottom Right: VFR 1 media was very compacted, shallow and had no observable limestone.

Above: VFR1 was capped to divert all flow to VFR2A and 2B.
Below: Due to debris entering the concrete inlet structure, a bar guard was installed to help prevent blockages in the system inlet pipe.