Dents Run BBWA 3888 Passive Treatment System
SRI O&M TAG Project #62 Request #1
OSM PTS ID: PA-277

Requesting Organization: Elk County Conservation District
Requesting Organization Representative: Micaela Lefever
Dates of work performed: 5/24/2023-6/15/2023

Initial Request: On 4/9/2019, Elk County Conservation District (ECCD) requested a site visit to evaluate the system due to treatment performance issues. The Bennett's Branch Watershed Association (BBWA) and ECCD reinvigorated the request in late 2022 with concerns about possible raw water pipe leaks and media permeability challenges.

Initial Site Visit, Observations, and Identified Needs: An initial site inspection was performed by SRI on 5/1/2019 but found the system to be performing well on that date. SRI worked with the conservation district and the Bennett's Branch Watershed Association (BBWA) to implement a water monitoring program to document when the system doesn't perform well, suspecting that it may just get overwhelmed during high flow events. The request was left open during this time. In late 2022, the BBWA reinvigorated the request. BioMost and SRI returned to the site on 4/17/23 to investigate again. The AMD was found to be largely bypassing the system confirming the group's new concerns about permeability issues of the VFP. A seep present down-gradient from the 2A collection system was found which required further examination. The end of the combined collection channel was becoming clogged with vegetation and debris. Options for maintenance and improvements to the system were developed and discussed with the BBWA and ECCD that would effectively provide some level of treatment until funding can be obtained for enhanced treatment if needed. On 5/24/2023, BioMost mobilized to the site to further investigate the leak and begin maintenance. It was determined that the 2B collection system was functioning properly and the "leak" was likely a separate seep.

Work Completed: Removal of compost from the VFW began shortly after equipment was mobilized to site. A test pit dug within the pond showed that the limestone below the compost layer was approximately 34" thick and generally very clean. Most of the compost was removed from the pond as feasible and limestone removal was kept to a minimal amount. Holes in the liner were noted and repaired. All stop logs for the Agri-drain were removed, cleaned, and lubricated. The remaining limestone was stirred and leveled. Stop logs were set with water above the stone surface. Compost removed from the VFW was graded, seeded, and mulched.

The inlet grate for the 2A collection system was removed and the inlet box was inspected and cleaned. No leaks or cracks were observed in the box. To further assess the status of the conveyance pipe from the 2A inlet, a camera was rented to check for breaks in the pipe. A cleanout tee was installed to check the entire length of the pipe and make future maintenance efforts easier. No breaks or damage to the entirety of the 2A conveyance pipe were observed while using the camera, indicating that the water down-gradient is from another source.

The outlet of the Open Limestone Channel (OLC) was cleared of debris and left similar to design grade. It was determined after examining the concrete box in the OLC that it was already free of debris and no further maintenance was needed.

Results & Discussion

Field water monitoring conducted by the BBWA prior to the 2023 maintenance indicated that the water that flowed through the vertical flow pond was generally improved and often had pH >6 and measurable alkalinity but reportedly could not handle more than about 60 gpm, with the remaining water bypassing treatment. Based upon available data, the 3888 discharge was characterized as acidic with pH of 3.7 and hot acidity of 63 and typically had relatively low iron and manganese concentrations of 1 mg/L or less, but aluminum 7 mg/L. As

the compost was not needed for treatment of this AMD, it was decided to remove the layer and stir the limestone. This significantly improved permeability of the treatment media. Water monitoring conducted by the BBWA post maintenance has demonstrated that the VFP can now handle flow rates exceeding 200 gpm and still produce water with a pH >6 and measurable alkalinity indicating great success of this effort. Water monitoring conducted during the 2025 statewide passive treatment snapshot provide further documentation. As the pH is now typically 6 or higher aluminum remaining in the treated water would be in the solid form and just needs to be settled. Building a settling pond and/or wetland would address this issue.

Recommendations & Future Considerations: Continue to monitor water quality and permeability for VFW. If water quality meets desired standards, continue sampling and consider adding additional limestone. Fresh compost/limestone/woodchip mix could be added if desired for enhanced treatment and higher alkalinity production but is not necessary. The addition of a settling pond would provide for the ability to settle aluminum solids and/or provide for the ability to flush metal solids from the VFP. Additional investigations and design work would be needed to capture and treat the additional seep that was found.

Photo Log

Top Left: Stone from the VFW test pit was generally very clean and free of metal precipitates (5/24/23).
Top Right: Repairs to pond liner completed as needed (6/2/23).
Bottom Left: Compost removed, and limestone leveled in VFW (6/2/23).
Bottom Right: Compost moved from surface of VFW (5/24/23).