Dents Run BBWA 3893 Passive Treatment System
SRI O&M TAG Project #60 Request #1
OSM PTS ID: PA-304

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

Initial Request: On 3/18/2019 Elk County Conservation District requested a site visit to clear vegetation from the forebay and address maintenance concerns in the Oxidation Precipitation Basin (OPB), including water flowing over the emergency spillway.

Initial Site Visit, Observations, and Identified Needs: An initial site inspection was performed by BioMost, Inc and SRI on 3/20/2019. Both inlet grates were clogged with vegetation which were cleaned restoring flow. The OPB was found to be frozen at that time and would need to melt before additional evaluation or maintenance could be completed. The watershed group was able to conduct maintenance on their own and restore flow through the OPB box. They also initiated monthly field water monitoring program for the system. A decision was made to leave the request open while the group conducted monitoring. After a couple of years, the OPB was overflowing again and water monitoring conducted indicated that the system was not able to fully treat the AMD. A plan was developed to improve treatment and BioMost returned to the site in May 2023.

Work Completed: Agri-drain stop logs for both VFWs and the settling pond were removed, lubricated, and reinstalled. An elbow and riser were installed at VFW 2 outlet to OPB to allow for flow measurements.

A 10” schedule 40 pipe and downward turned elbow was installed with the invert approximately 1’ lower than the emergency spillway outlet elevation. This will act as the new OPB outlet and make maintenance easier going forward compared to the previous outlet at the bottom of the pond. To better mix water from Seep 8 with the untreated water from Seep 9, a directional baffle curtain was installed in the OPB.

The Seep 8 forebay on both sides of the access road was cleared of vegetation to the extent the excavator could reach (approximately 20’). Additional deep pools were established near the inlets and outlets of the pond to discourage vegetation growth and reduce clogging.

Vegetation was removed as needed from the gabion baskets at the inlet pipes to each VFW and the OPB to maintain open flow paths and allow for flow measurements. A riser was installed at the OPB inlet from Seep 8 to facilitate flow measurements.

A section of the type M inlet box was removed from the forebay outlet to facilitate easier cleaning of the perforated shielding at the box inlet. A concrete section was also removed from the Seep 9 intake to the OPB and a diversion structure was installed to direct flow to the remaining inlet box structure if the lower intake becomes clogged. A deeper pool was also excavated in front of the inlet box structure.

Results and Discussion

The original design for the passive treatment system included two separate treatment trains for AMD discharges 8 and 9, but only the 8 portion of the system was constructed with the hopes that the treated flow from 8 would mix with the untreated 9 discharge in the OPB and have sufficient excess alkalinity to neutralize the acidity of the 9 discharge. Prior to maintenance and system upgrades completed in 2023, the AMD was only being partially treated with AMD often flowing over the emergency spillway due to problems with the Agridrain box. Field data collected by the watershed group generally indicated low pH from the system. Samples collected

from the final effluent in July 2020 under relatively lower flow conditions had a pH of 4.6, net-acidic and metals remaining. Field water monitoring conducted by the watershed group since the 2023 maintenance has demonstrated mixed results. For large portions of the year, water quality has significantly improved since the upgrades with pH often >6 and measurable alkalinity demonstrating that the new outlet point along with the installed baffle curtain provides better mixing of the treated AMD 8 with the "untreated" AMD 9. However, it appears that during periods of higher flow, the excess alkalinity produced by 8 is not sufficient and the effluent of the pond can still remain a pH less than 6 or even less than 5.

Recommendations & Future Considerations: Continue monitoring the system and impacts to the stream. If full treatment of both discharges is desired year-round, the system will need to be expanded and funding should be sought to develop a design.

Photo Log

Top Left : Seep 8 forebay on both sides of the access road was cleared of vegetation (6/2/23).
Top Right: All stop logs were removed, cleaned, and lubricated for each applicable component (6/2/23).
Bottom Left: A new OPB outlet was installed (6/15/23).
Bottom Right: Directional baffle installed in OPB (5/24/23).

Photo Log

Top Left : Seep 9 inlet before it was cleared of vegetation (6/14/23).
Top Right: Diversion structure was installed to direct flow to the Seep 9 inlet box structure (6/16/23).
Bottom Left: Riser installed at the OPB inlet from Seep 8 to facilitate flow measurements.
Bottom Right: Seep 9 inlet after it was cleared of vegetation and lowered (6/16/23).