Morgan Run Passive Treatment System
SRI O&M TAG Project #77 Request #1
OSM PTS ID: PA-280

Requesting Organization: Western Pennsylvania Conservancy
Requesting Organization Representative: Greg Schaetzle
Dates of work performed: 3/21/2024-5/2/2024

Initial Request and Site Investigations: On 5/30/23, the Western Pennsylvania Conservancy requested assistance with maintenance issues at the Morgan Run 1 & 2 treatment systems initially identified by Hedin Environmental. Limited information about the passive system was available including a lack of design details or as-builts which hindered system evaluation and maintenance considerations. SRI conducted an initial site visit on 8/9/23 to assess the site and then began correspondence with BioMost, Inc about performing maintenance. SRI met with BioMost on 3/21/24 prior to mobilization in April to conduct an additional site visit, discuss needs and develop a plan. Items of note and topics discussed from these site visits included:

Morgan Run 1

- Set a permanent pipe in the collection channel from the MR1 A-2 upwelling to the A-2 VFP. Visual estimate on flow during the site visit was 20-30 gpm.
- A-2 VFP was passing some water but mainly overflowing (VFP is lined).
    - Water level was high and cloudy so top of media was not visible.
    - The treated water passing through the system was “E” pipe = 7.0 pH; “W” pipe = 7.0 pH.
    - Emergency spillway for the A-2 VFP needs cleared of vegetation.
    - Drain valve for VFP located and exercised.
    - VFP iron to be removed (as feasible) and placed in B-2 (Settling Pond).
    - Excavate test pits with depths and photos to document condition of media & evaluate.
    - Avoid full stir due to liner presence and unknown piping configuration.
- B-2 Outlet spillway full of vegetation forcing pond to overtop.
    - Clean outlet spillway of vegetation to restore flow.
- The wetland system was flowing as designed; Flow entering the top of that part of the system was ~3 gpm (visual approx.) pH~5.9.
    - Note: Wetland spillways look like they may have been dug out or washed out during extreme flows; They are eroded but appear stable.
- Final Effluent for Morgan Run 1 system was pH = 6.0.

Morgan Run 2

- MR2-A2 collection was overflowing in two directions (to the stream, and over the berm to the system).
    - Adjust stream side embankment to prevent MR2-A2 from overflowing directly to the stream.
    - Establish new overflow spillway from MR2-A2 down to A-1 pool (for inclusion into B-1 VFP during overflow events
    - This overflow spillway can be rock lined with stone that is covering existing pipe as needed.
- Maintenance needed for the N-12 bypass pipe from Collection ditch to C-1.
    - Clean out the remaining portion of bypass ditch to C-1 of vegetation and iron.
    - Clean out the plugged portion of pipeline from the collection to re-establish flow through the pipe.
- Clean out the channel from A-1 to B-1 VFP where it goes under the pipeline (handwork?)
- Clean the B-1 VFP spillway of vegetation & precipitates.

- B-1 VFP is passing all of the flow, but it has marginal water quality coming through indicating either short-circuiting or insufficient treatment media. "Effluent riser 1" = 4.8 pH, "Effluent Riser 2" = 4.5 pH, "Effluent Riser 3" = ~6.0 pH
    - A lack of design drawing details, as-builts or other information about the treatment media prevents further evaluation.
    - There is concern of damaging liner if test pits or stirring conducted.
    - B-1 VFP issues larger than the scope of this maintenance; No additional work at this time.
- C-1 is overtopping and losing some water to the stream.
    - Clean the C-1 outlet spillway to the wetland of vegetation to reestablish flow through this pond. (C1- effluent pH ~ 5.5).
- Wetland effluent pH ~ 5.1.
- Note the "North Seep" had a small amount of flow and a pH ~ 4 that flows into the stream immediately downstream of the system effluent. This seep might be able to be picked up at a higher location and treated separately in a limestone bed in the future if the system is rehabilitated / expanded (and if deemed worthwhile to add additional treatment for this source). Additional treatment is outside the scope of the current maintenance efforts but should be noted for possible future improvements to the site. The bench paralleling the stream is wet with standing water in places, but buildable looking if an expansion effort is desired.

Work Completed:

- MR1 A-2 VFP valves located, and treatment media washed, pumped, and flushed multiple times to reduce clogging due to sediment accumulation.
- MR1 A-2 VFP emergency spillway cleared of vegetation.
- MR1 A-2 VFP media washed and pumped as feasible to B-2 settling pond. Care was taken to avoid damage to the underdrain and liner, so a more thorough wash was not completed.
- MR2-A2 collection ditch improved including cleaning around the conveyance pipe and directed overflow to A-1 pond rather than Morgan Run.
- Installed overflow channel from MR2-A2 collection channel to A-1
- Jettered pipeline that conveyed the MR2-A2 discharge from collection ditch to pond C-1 restoring flow.
- Reattached MR2B-1 VFP riser
- Monitoring pipes for flow measurements installed at MR1-A2 inlet channel, MR1-A1 inlet channel, and MR2-A2 collection channel overflow to obtain background data for system redesign.
- Various collection channels at both systems cleared of sediment and vegetation as needed.

Additional Recommendations

There appears to be a lack of complete and consistent data sets available for a true evaluation of the system's long-term functionality. Available data does indicate that the system, especially the MR2 system is not performing as desired, even after maintenance was completed, although more water is likely being treated now compared to prior to maintenance activities. Continue to conduct water monitoring, including flow measurements, as well as site inspections on a regular basis. This information will be needed to redesign the system. A redesign of the treatment system should likely be completed. Including a Terraced Iron Formation (TIF) type component at MR1-A2 to promote iron removal prior to treatment in the VFP should be considered to improve long-term viability of the VFP. Installing a channel to convey flow from MR2-A2 to C-1 should be evaluated to reduce maintenance needs associated with the pipeline. An evaluation should be conducted to potentially capture and treat the North Seep. Further maintenance may be required to improve system functionality at MR1 A-2 VFP.

Photo Log

Top Left: Morgan Run 1 vertical flow pond flush valves were located and exercised (4/18/24).
Top Right: Morgan Run 1 media within the vertical flow pond was stirred on the surface and sludge pumped to the settling pond (4/19/24).
Bottom Left: Morgan Run 1 flow monitoring pipe installed for additional discharges (5/2/24).
Bottom Right: Morgan Run 1 flow monitoring pipe installed for main discharge (4/19/23).

Top Left: Morgan Run 2 bypass pipe from Collection ditch to C-1 clogged (5/16/24).
Top Right: Morgan Run 2 bypass pipe from Collection ditch to C-1 was jettered (5/16/24).
Bottom: Morgan Run 2 bypass pipe inlet from Collection ditch to C-1 exposed and jettered (5/16/24).