

Laurel Run #1 Passive Treatment System
SRI O&M TAG Project #29 Request #2
OSM PTS ID: PA-191

Requesting Organization: Blacklick Creek Watershed Association
Requesting Organization Representative: Dennis Remy
Municipality/County: Rayne Township, Indiana County
Dates of work performed: 5/20/2019

Initial Request: On 3/15/2019, the Blacklick Creek Watershed Association (BCWA) reported that a large portion of the AMD was not flowing through the treatment media of the Vertical Flow Ponds and was instead overtopping the berms and bypassing treatment. The group was advised to "burp" the system as air locks have occurred at this system throughout its life. BCWA reported back that it had attempted to do this with little success.

Initial Site Visit, Observations, and Identified Needs: On 5/20/19, a site investigation was conducted to assess the system. Water samples were collected and select data provided in the below table. While the water that flowed through VFP-E and VFP-W was good, a portion of the water was overflowing the berm and bypassing the system without treatment. VFP-N was providing minimal treatment and a possible broken pipe was observed at the VFP-N outlet piping structure. VFP-E and VFP-W were "burped" and flushed for a short period of time. Based upon the age of the system, frequent permeability problems, and other maintenance issues, a decision was made to seek funding to complete full rehabilitation of the system.

Sample Point	Date	pH (Lab)	Conductivity	Alkalinity	Acidity	T. Fe	T. Mn	T. Al	SO4	TSS	Flow
RAW	05/20/19	3.00	864	0	155	24.75	3.39	9.63	321	11	
VFP-E*	05/20/19	6.75	960	133	-100	2.53	3.40	1.83	424	11	62
VFP-N*	05/20/19	3.86	631	0	30	23.16	3.76	0.99	321	38	
VFP-W*	05/20/19	6.87	1160	147	-129	24.57	2.99	1.80	565	22	28
WETLAND	05/20/19	4.96	716	2	20	5.17	3.87	2.92	376	14	

All parameters in mg/L except pH, conductivity in umhos, and flow in gpm. Possible break in VFPN piping; Not all flow through outlets of VFP- E and VFP-W and short circuiting through emergency spillway

Work Completed: A decision was made to conduct maintenance to try to improve performance while seeking/waiting for funding to rehabilitate the system. An additional request was received concerning water short circuiting the treatment system and maintenance was conducted in February 2020. After testing water coming out of the ground near the pipe manifold for the east/ west systems, it was determined from 6-6.5 pH water (53 field alkalinity on 2/20/20) that it was likely not raw mine water but a spring which had developed. Excavation near the VFP North outlet piping revealed that there was a break which had developed, likely due to settling after construction. The break was repaired.

Additional seeps which had developed near the collection system for all three treatment ponds were low pH (about 4 pH with a Hach colorimeter). This water was collected and flowed to the system inlet manifold box. After assessing water quality within the system, each vertical flow pond was stirred to try and improve permeability and extend the system life while funding was obtained to reconstruct the treatment components and improve treatment.

Low pH iron accumulated within the inlet flow control box had begun to clog the distribution pipes. Flow to the VFP-N was not reaching the inlet pipe, indicating that there was low pH iron clogging the pipe. The O&M crew returned on 5/1/20 with additional equipment to snake out the inlet pipe of VFPN and restore flow to the treatment pond.

A conceptual design and cost estimate were developed. A grant application was submitted to PA DEP's Growing Greener program in December 2019. Funding has been obtained and a system rehabilitation is expected to commence in the near future. A grant to US OSMRE Watershed Cooperative Assistance Program was submitted to provide the required matching funds which was also approved. Design of a new system is underway with construction anticipated to begin in 2023.

Photo Log



Top Left: Water level of the VFP-E high due to impermeable media (5/20/19).

Top Right: Water quality was assessed throughout the system (5/20/19).

Bottom Left: VFP-N was drained and a break was found in the outlet piping (5/20/19).

Bottom Right: VFP-W & VFP-E were flushed to rule out an airlock as the cause of lack of permeability (5/20/19).

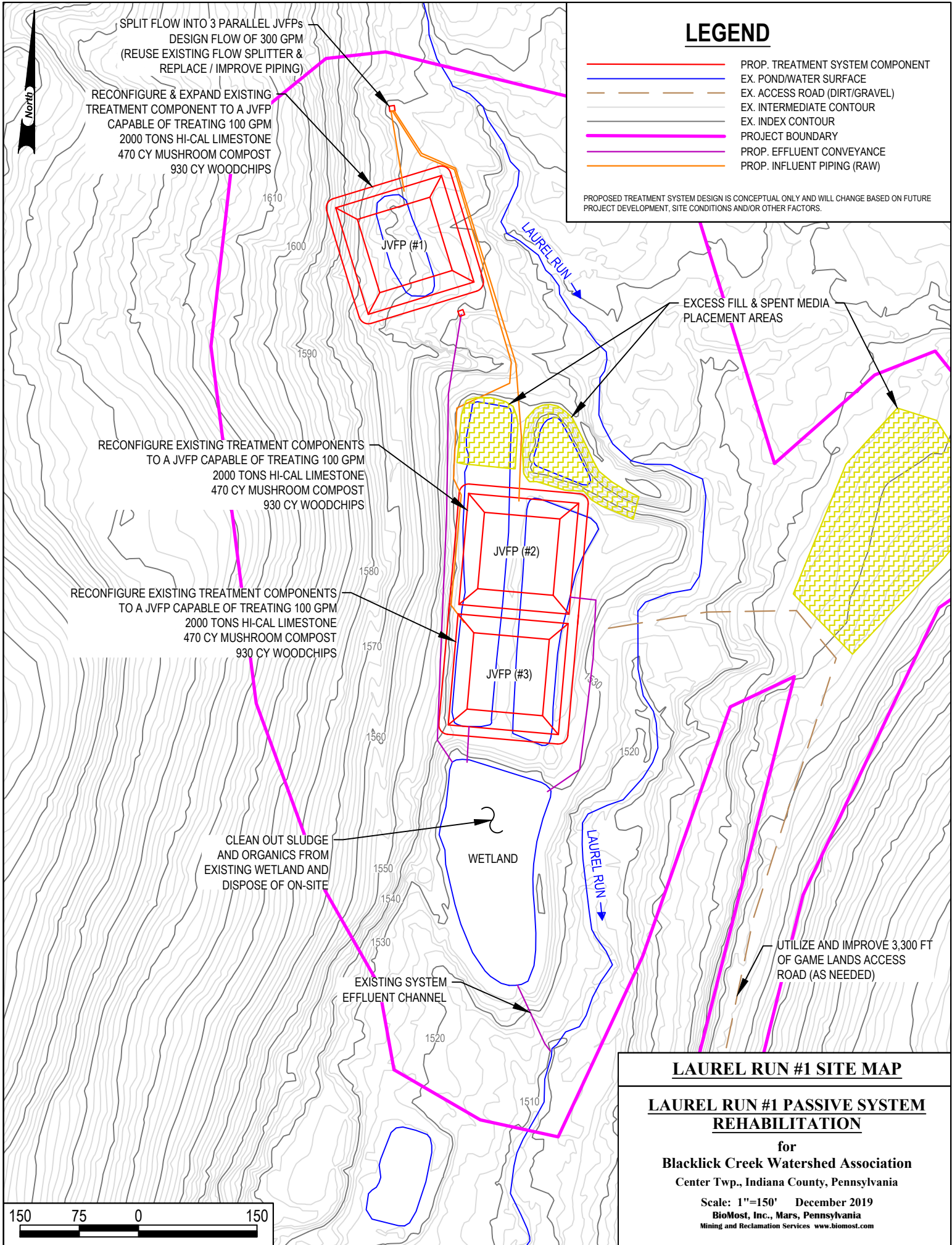


Top Left: Excavation near the VFP-N outlet pipe revealed there was a break (2/19/20).

Top Right: Test pit in VFP-N to check media condition (2/20/20).

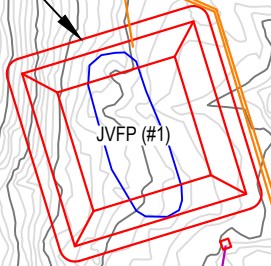
Bottom Left: The inlet pipe to VFP-N was cleaned with mechanical snake (5/1/20).

Bottom Right: All three VFPs were stirred to try and improve permeability (2/25/20).

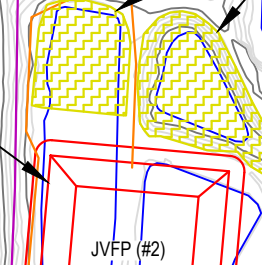


SPLIT FLOW INTO 3 PARALLEL JVFPs
 DESIGN FLOW OF 300 GPM
 (REUSE EXISTING FLOW SPLITTER &
 REPLACE / IMPROVE PIPING)

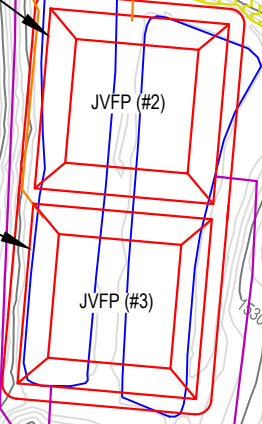
RECONFIGURE & EXPAND EXISTING
 TREATMENT COMPONENT TO A JVFP
 CAPABLE OF TREATING 100 GPM
 2000 TONS HI-CAL LIMESTONE
 470 CY MUSHROOM COMPOST
 930 CY WOODCHIPS



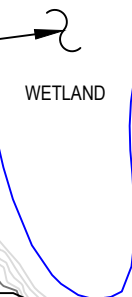
RECONFIGURE EXISTING TREATMENT COMPONENTS
 TO A JVFP CAPABLE OF TREATING 100 GPM
 2000 TONS HI-CAL LIMESTONE
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CLEAN OUT SLUDGE
 AND ORGANICS FROM
 EXISTING WETLAND AND
 DISPOSE OF ON-SITE



EXISTING SYSTEM
 EFFLUENT CHANNEL

UTILIZE AND IMPROVE 3,300 FT
 OF GAME LANDS ACCESS
 ROAD (AS NEEDED)

