

Bilger Run BR3.9 Discharge Passive Treatment System Final Report June 2008

The design and construction of the Bilger Run Passive Treatment System was funded by an EPA 319 grant in 2006. The system consists of an anoxic limestone drain (ALD) that discharges into an existing pond. Treatment of this discharge, identified in the watershed restoration plan as BR3.9, is a was a priority recommendation of the recently developed restoration plan for Anderson Creek (correct?) The following is a description of each project task and its deliverable.

Project Planning

A restoration plan for Anderson Creek, prepared by Western Pennsylvania Conservancy, identified the AMD discharge BR3.9 as a priority treatment effort. The discharge was considered suitable for reliable passive treatment and suitable for restoration by the ACWA through a Growing Greener grant. Hedin Environmental, a small PA consulting firm that specializes in passive AMD treatment, was selected to provide a technical proposal that included a plan and budget to design and construct the system. ACWA incorporated the HE proposal into a Growing Green proposal that was submitted in 2006 and funded in 2007 (right years?). A formal contract was developed with HE to design the system and oversee its construction. Project work began in June? 2007?. (Neil: modify this as necessary idea is provide project background.)

Site Assessment and Survey

A site visit was conducted by Hedin Environmental staff to determine the best method for capturing and treating the discharge. Wetland delineation by Cedar Run Environmental (Mill Hall, PA) identified wetlands on the site. A survey crew from DEM Surveying (Brookville, PA) mapped the site and produced basemapping that showed site topography and wetland locations for use in the design.

Design and Permitting

Design plans were prepared that utilized a curving ALD that avoided wetland impacts while still providing suitable residence time and discharge capture. The design was presented to the ACWA on September 12, 2007. Following the meeting, minor changes were made to the design in order to address ACWA concerns. An erosion and sediment control plan was prepared.

Specifications and Bidding

A bid package was prepared that included detailed specifications for construction of the project. Hedin Environmental staff aided in the bidding process by attending a site pre-bid meeting with prospective contractors and answering questions from bidders. The second lowest bidder, E.M. Brown (Clearfield, PA), was selected by ACWA as the construction contractor due to their assertion that they could begin construction immediately. The low bidder stated in their bid that they could not start until January 14, 2008.

Construction

Construction began with installation of erosion and sediment control measures in the first week of January. Hedin Environmental staff conducted seven oversight visits during the construction process. The dimensions of the ALD were verified prior to limestone placement. The ALD was completed and discharging water by the first week in February 2008. Construction photos are attached.

System Monitoring

Three sample rounds were conducted during which the ALD outfall and final outfall were sampled. Sampling of the raw discharge water is not possible due to the nature of the ALD construction. Flow was measured from the ALD. Field measurements of pH and alkalinity were also made at both the ALD and final outfall. The final outfall pipe is too close to the ground to allow for accurate flow measurement so flows are not measured at this location. The monitoring results are shown in the following table.

Table 1: Treatment System Performance February

Location	Date	Flow	pH	Net Acidity	Fe	Al	Mn
ALD Outfall	2/19/08	63	7.7	-147	ND	<0.1	2.2
Final Outfall	2/19/08		7.9	-131	0.3	0.2	2.3
ALD Outfall	4/14/08	61	7.7	-99	ND	1.6	0.2
Final Outfall	4/14/08		7.4	-113	0.2	0.2	0.3
ALD Outfall	5/28/08	14					
Final Outfall	5/28/08						

Units: Net Acidity, Fe, Al and Mn are mg/L; flows are gpm

Thus far water quality from both the ALD and the Final system effluent are net alkaline with no dissolved iron or aluminum. Minor increases in iron concentration noted between the ALD and Final effluent is likely due to the fact that the pond is excavated below the local water table. As a result the pond receives both treated effluent from the ALD and, under some conditions, groundwater from other parts of the site.

Complete laboratory results are attached.

O&M Plan and Final Report

An Operation and Maintenance Plan has been prepared and is attached. It is intended to provide clear and concise instructions for the relatively minor maintenance tasks required for this system.

Bilger Run Construction Photos



ALD excavation and dewatering pump, January 21, 2008



ALD excavation, January 24, 2008

Bilger Run Construction Photos



ALD excavation, January 28, 2008



ALD excavation, January 29, 2008

Bilger Run Construction Photos



ALD limestone placement, February 6, 2008



ALD finished grade, February 19, 2008

Bilger Run Construction Photos



ALD outfall, February 19, 2008



System final outfall, February 19, 2008

Bilger Run ALD Water Quality Monitoring Results

SAMPLE

<u>ID</u>	<u>SAMPLE</u> <u>DATE</u>	<u>FLOW</u> <u>/ SWL</u>	<u>LAB</u> <u>PH</u>	<u>COND.</u> <u>umhos</u>	<u>ALK.</u> <u>mg/L</u>	<u>FIELD</u> <u>ALK</u>	<u>ACIDITY</u> <u>mg/L</u>	<u>IRON</u> <u>mg/L</u>	<u>MANG.</u> <u>mg/L</u>	<u>ALUM.</u> <u>mg/L</u>	<u>SO4</u> <u>mg/L</u>	<u>TSS</u> <u>mg/L</u>	<u>LAB</u> <u>ID</u>
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ALD	19-Feb-08	63.10	7.73	1017	165.14	140.00	-146.96	<0.04	2.21	0.06	367.6	2	397392
ALD	14-Apr-08	61.00	7.65	572	125.14	140.00	-99.29	<0.04	0.24	1.55	157.8	2	400856
FINAL	19-Feb-08		7.89	600	145.18	125.00	-131.20	0.26	2.26	0.16	141.3	3	397391
FINAL	14-Apr-08		7.40	557	133.43	126.00	-112.68	0.16	0.34	0.22	142.9	4	400857