



**LACKAWANNA
WONDERFUL**

Lackawanna County Commissioners
A.J. Munchak, Robert C. Cordaro
and Michael J. Washo

AYLESWORTH CREEK ACID MINE DRAINAGE PROJECT

Archbald Borough, Lackawanna County, Pennsylvania

Lackawanna County, under funding from the Lackawanna Watershed Program has improved the water quality in Aylesworth Creek and Aylesworth Creek Lake by replacing a malfunctioning mine water treatment system with a buried oxic limestone drain. The project is located on the West Branch of Aylesworth Creek, approximately 2,700 feet upstream of the Aylesworth Dam in Archbald Borough, Lackawanna County, Pennsylvania. Average pH of water in the West Branch is 4.9; without treatment pH of lake water can fall below 6.0.

This mine drainage project replaced a malfunctioning revolving drum/limestone doser acid treatment system that had been constructed in 1983 by the Commonwealth under the Scarlift Program. Disadvantages of the doser system were that it was frequently out of service awaiting repair from vandalism, required manual reloading of the limestone, and did not function during freezing temperature.

The Lackawanna Watershed Program constructed a limestone drainage system consisting approximately 25,000 cubic feet (1,260 tons) of buried limestone. The replacement system utilizes the existing intake structure/piping, filled the existing doser structures and constructed a new underground drainfield, measuring 25 feet wide, 260 feet long and 5 feet deep. The system will require no maintenance for at least 20 years, and the buried nature of the system is not subject to vandalism. Construction of the drainfield was completed in spring 2006; problems with the existing intake structure, delayed start up until May 4, 2007. Total construction project costs = \$ 259,538.

Lackawanna County's Project Partners

US EPA – Grant Funding through Special Appropriations Grant
 US Army Corps of Engineers – Baltimore District: Property owners
 US Army Corps of Engineers – Philadelphia District: Technical assistance to EPA
 PADEP Bureau of Abandoned Mine Reclamation: Design technical assistance
 Archbald and Jermyn Boroughs: Property lessees

Test Results

Location	Before Start Up	10 days after		System	System restarted
	5/1/2007	Start-up	5/31/2007	Bypassed	after 3 wk Bypass
	pH	5/14/2007	pH	6/21/07	7/13/07
Intake Pond	4.90	4.89	5.57	6.06	5.23
Outlet of Drain	n/a	7.71	8.31	n/a	6.55
Inlet Stream	5.68	6.51	8.23	7.75	6.70
Lake Inlet	5.40	5.91	6.02	6.07	5.55
Beach East	5.23	5.65	6.30	6.38	6.40
Beach West	5.19	5.54	6.57	6.43	6.10
Dam Outlet	5.83	5.42	7.25	6.57	6.05

PROGRAM MANAGER:
MWH
1300 Old Plank Road
Mayfield, PA 18433

Program Partner:
Acker Associates
P.O. Box 899
Moscow, PA 18444

Lackawanna County Liaison:
Lackawanna County
Strategic Planning & Special Projects
200 Adams Avenue, Suite 614
Scranton, PA 18503



Placing Geotextile Liners – April 2006



Limestone and Monitoring Ports – May 2006

Project: Aylesworth Creek
Archbald Borough, Lackawanna County

Quantity calculations are based on Acid Mine Drainage: Control and Treatment, Second Edition publication compiled by Jeffrey Skousen and Paul Ziemkiewicz, 1996, West Virginia University and the National Mine Land Reclamation Center, Morgantown, West Virginia.
Chapter 25 - "Anoxic Limestone Drains for Acid Mine Drainage Treatment" by Jeffrey Skousen

Given:

Flow (gpm) = 2500
Acidity (mg/l) = 10
Life of Drain (year) = 20
CaCO₃ content (%) = 90
Limestone Dissolution (%) = 75

Results:

Tons of limestone needed, cubic feet and yards of excavation, and retention time

Calculations:

Flow x acidity x 0.0022 = **A** tons/year acid = 55.0
A tons/year x year of life = **B** tons of limestone = 1,100
B tons/calcium carbonate content = **C** tons = 1,222
C tons/dissolution = **D** total tons = 1,630

Convert total tons to cubic feet and cubic yards (unit weight of limestone = approx. 100 pcf)

D total tons = 32,600 ft³
= 1,210 yd³