

SLIPPERY ROCK WATERSHED COALITION
GOFF STATION RESTORATION PROJECT

“A Public-Private Partnership Effort”
 Venango Township, Northern Butler County, PA

PROJECT PARTICIPANTS:

PADEP Knox District Mining Office	Quality Aggregates Inc. (EIS Member)
Grove City College	Aquascape (EIS Member)
BioMost, Inc. (EIS Member)	SRWC Volunteers
Private Landowners	Girl Scouts
PA Game Commission	Stream Restoration Inc. (EIS Member)
Jack Camberlain Surveying	Venango Township Supervisors
Scrubgrass Generating Plant	PADEP Bureau of Abandoned Mine Reclamation
Urban Wetlands Institute	Jennings Environmental Education Center PADCNR
WOPEC (EIS Affiliate)	Butler County Youth Services
Concordia Haven residents	

COMPLETION DATE: Major construction completed Fall 2001; Water Quality Monitoring ongoing by PA DEP, Knox DMO and Grove City College(receiving stream)

DRAINAGE ABATEMENT: With an average total flow of about 400 gpm, six discharges, ST38, 39, 40, 40A, 41, 42, issue from a large, abandoned underground mine through an abandoned surface mine. Mine pool elevations required manipulation during construction. Four Vertical Flow Ponds (two sets operating in parallel) containing a total of 8200 tons, AASHTO #1, 90% CaCO₃ limestone aggregate, were installed to treat the mine drainage. (ST38 & 39 VFPs contain 3000 T/pond while ST40 & 42 VFPs contain 1100 T/pond.) Three of the four Vertical Flow Ponds have ~½-foot of spent mushroom compost overlying the aggregate. One for ST40 & 42 contains limestone only to evaluate the treatment contribution of the spent mushroom compost. Three acres of naturally-functioning aerobic wetlands supporting 38 species were created. Innovative implementations: cleanouts, bioswale, pit ponds as treatment wetlands, two-tiered Vertical Flow Pond underdrains, muskrat barrier within berms, subsurface stream incursion barrier, demonstration of compost and limestone vs. limestone-only treatment media.

The treatment media generates alkalinity. Two tiers of perforated plastic pipe aid in flow distribution and flushing in the Vertical Flow Ponds. Treated water discharges through outlet control structures into settling or flush ponds to allow periodic flushing to remove accumulated metal precipitates (mainly iron and aluminum). The wetlands enhance wildlife habitat and facilitate additional iron oxidization and settling of metal solids.

OTHER RESTORATION ACTIVITIES: Removing, neutralizing (with circulating, fluidized-bed coal ash), and using ~78,000 CY of abandoned coal refuse to reclaim a nearby abandoned surface mine. Installation of bluebird, kestrel, and bat boxes. Creation of unique bat hibernaculum to potentially winter thousands of bats, the first in PA.

WATER QUALITY(representative):

	Flow (gpm)	pH	alkalinity (mg/l)	acidity (mg/l)	Fe (mg/l)	Mn (mg/l)	Al (mg/l)
Raw	50-400	3.6	0	100	20	3	7
Final	64-300	6.5	30	0	0.3 (diss. 0.1)	0.9 (diss. 0.3)	0.5 (diss. 0.2)

Neutralization of ~87,100 lbs/yr of acidity and retention of ~12,600 lbs/yr of metals in settling ponds.

PUBLIC OUTREACH: During construction and within the first year of operation an estimate of over 400 people have toured the site or directly participated in the development of the project. The site is continuing to be used in watershed education programs by the Jennings Environmental Education Center.

FUNDING SOURCE:

Commonwealth of Pennsylvania “Growing Greener” and WRAP; contributions from project partners



BEFORE:

Old strip pit filled with acidic, iron and aluminum-bearing mine drainage.



DURING:

Bulldozer spreading limestone over the pipes in a Vertical Flow Pond.



AFTER:

Completed VFP 3 AND 4 successfully treating mine discharges.