

Glenwhite Run Watershed Restoration Project - Fact Sheet

Abandoned Mine Drainage in Blair County

“It is the goal of all watershed stakeholders, including the Blair County Conservation District to at least begin restoration planning on all four watersheds by 2005.”

Blair County has four (4) watersheds impacted by AMD

- Glenwhite Run
- Kittanning Run
- Shaw Run
- Sugar Run

Glenwhite Run Restoration

Background – Glenwhite Run Watershed

- Glenwhite Run is located just west of the historic Horseshoe Curve
- Is a 5.8 mile stream with headwaters in Gallitzin Township, Cambria County and leading through Allegheny and Logan Townships, Blair County and then finally into Kittanning Point Reservoir
- 3.8 miles of Glenwhite Run is listed on the State’s 303 (d) “List of Impaired Waters” as a medium priority with the source of impairment being abandoned mine drainage with the cause of impairment listed as metals
- The watershed encompasses approximately 3,500 square acres primarily consisting of mixed hardwood forest with 12% mined land

History

The Horseshoe Curve Resources Coalition was founded in late 1995. The Blair County Conservation District called a meeting in September of that year to discuss the potential restoration to the Glenwhite and Kittanning Run Watersheds. Twenty-three individuals were present that day representing Local, State and Federal governments, local landowners, and local environmental and historical organizations.

The group’s first major accomplishment was receiving the whole-hearted support of the Blair County Commissioners by signing the PL-566 Project Application for the Assessment of the Glenwhite Run Watershed, which occurred in early 1996. The final watershed plan and environmental assessment was completed in July of 1997. The group continued to meet regularly through 1997 and from these meetings the groundwork was laid to begin restoration within not only Glenwhite Run but to include any of the four Blair County Watersheds impacted by abandoned mine drainage.

From this endeavor, the first Abandoned Mine Drainage abatement project completed in Blair County was in the Shaw Run Watershed, located west of Bellwood. This project, which consisted of extensive surface revegetation and a rock lined channel, was completed in the

summer of 1999. Construction in Glenwhite began in mid 1999 with work being performed using U.S.D.A. Natural Resource Conservation Service PL-566 and Section 319 funds on the South Tributary Site. Work then progressed by virtue of Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation (BAMR) Staff and Funding (10% Set Aside) in 2000 on the Squatter Falls Site. In the meantime, PL-566 and Growing Greener Funds were utilized to complete the Barrens Project in 2000. Progression through BAMR with funding from the Appalachian Clean Streams Initiative and Growing Greener continued on Coke Ovens, Clearwater and Spaghetti Hole sites being completed late 2001. The final project, North Slope commenced in 2001, with a new funding source. This time Growing Greener was matched with a portion of the Penalty Assessment levied against Conrail through the Attorney Generals Office. North Slope was completed in summer of 2002.

Restoration Planning:

- A coalition was formed of local professionals, concerned citizens and governmental agency personnel
- The next step was to adequately assess the problems and develop a watershed restoration plan. In conjunction with all partners a Watershed Plan and Environmental Assessment was completed by the United States Department of Agriculture, Natural Resources Conservation Service in July, 1997
- A restoration plan was developed which included a total of eight (8) treatment sites using several passive treatment systems in conjunction with land reclamation

The eight (8) passive treatment sites were divided between Pennsylvania Department of Environmental Protection-Bureau of Abandoned Mine Reclamation (DEP-BAMR) and the Blair County Conservation District

- Coke Ovens
- Clearwater
- East Barrens
- North Slope
- South Tributary
- Spaghetti Hole
- Squatter Falls
- West Barrens

Project Responsibility:

The Conservation District addressed 4 of the 8 sites,

- East Barrens – land reclamation
- West Barrens – land reclamation
- South Tributary – vertical flow system
- North Slope – vertical flow system

The remaining 4 sites were addressed by PA-DEP- BAMR.

- Squatter Falls – vertical flow system/ ® Pyrolusite bed
- Coke Ovens – vertical flow system
- Spaghetti Hole – vertical flow system
- Clear Water – anoxic limestone drain

Construction cost of Reclamation:

- North Slope \$640,000
- Spaghetti Hole \$359,600
- Coke Ovens \$328,900
- Squatter Falls \$252,000
- East & West Barrens \$209,284
- South Tributary \$162,000
- Clearwater \$152,400

Total cost of construction was approximately 2.1 million dollars

Partnerships make everything happen:

- Altoona City Authority
- Blair County Commissioners
- Blair County Conservation District
- Horseshoe Curve Resource Coalition
- Pennsylvania Department of Environmental Protection
- U.S.D.A. Natural Resources Conservation Service

Primary Landowners:

- Altoona City Authority
- Cooney Brothers Coal Company

Funding Sources:

- Blair County Conservation District: Watershed Restoration Fund
\$340,000 (North Slope and South Tributary)
- DEP- Bureau of Abandoned Mine Reclamation - 10% Set Aside
\$252,400 (Squatter Falls)
- Growing Greener: Environmental Stewardship and Watershed Protection Grant
\$847,600 (East & West Barrens and North Slope)
- Growing Greener: Funding directly to the Dep - Bureau of Abandoned Mine Reclamation
\$767,400 (Coke Ovens, Clearwater, Spaghetti Hole)
- Office of Surface Mining - Appalachian Clean Streams Initiative
\$73,500 (Coke Ovens, Clearwater, Spaghetti Hole)
- Watershed Protection and Flood Prevention Act: PL 83-566
\$135,400 (Barrens and South Tributary)
- Section 319 (U. S. Environmental Protection Agency)
\$99,570 (South Tributary)

Average Water Quality of Glenwhite Run

EASI Senior Environment Corps
 SEC: Blair County
 Water Body: Glenwhite Run
 Site ID: 16428:4.70:20020607 (1031)

	pH	Dissolved Oxygen mg/L	Specific Conductance uS/cm	Nitrates mg/L	Phosphates mg/L	Sulfates mg/L	Total Alkalinity mg/L
Mean	7.49	9.5	197	0.27	0.04	124.25	17.5

East Barrens & West Barrens - This site consists of two abandoned strip mine areas that were eroding at an excessive rate. Sediment delivery to the streams was estimated at 300 tons/ year. Both sites were graded, limed, fertilized and seeded. Extensive diversions and rock channels were installed to manage surface water flow to reduce erosion.

Coke Ovens - The mine opening was exposed to allow free flow of the mine drainage out of the mine. The discharge then flows into the initial sediment basin, from there down a rock channel and into the vertical flow system for treatment. The water is then discharged into a final settling basin and then into an aerobic wetland for final polishing

Average Flow 22 gpm

Average Water Chemistry – Pre-treatment:

pH 2.97
 Iron 6.95 mg/l
 Aluminum 2.26 mg/l
 Acidity 106 mg/l

Average Water Chemistry – Post treatment

pH 7.33
 Iron 0.48 mg/l
 Aluminum 0.15 mg/l
 Acidity -100 mg/l

Clearwater - This discharge is mildly contaminated by mining. The mine flow in this case has been enclosed in a pipe which is then directed through an anoxic limestone drain (ALD). This system is closed to eliminate oxygen while providing an increase in pH. The flow is then discharged into an aerobic wetland.

Average Flow 75 gpm

Average Water Chemistry – Pre-treatment:

pH 4.4
 Iron 0.11 mg/l
 Aluminum 1 mg/l
 Acidity 22.0 mg/l

Average Water Chemistry – Post treatment

pH 8.04
 Iron 0.16 mg/l
 Aluminum 0.13 mg/l
 Acidity -95 mg/l

North Slope - There are five acid discharges flowing from abandoned deep mine openings and large, denuded seepage areas. Approximately two acres of upland forest has been destroyed by mine drainage.

This site has the highest levels of aluminum and acid of any discharges in the watershed. The treatment system includes two initial sediment basins, two vertical flow treatment ponds and a large final settling basin. This project took two years to complete and required additional components such as a High Density Poly Ethylene (HDPE) liner (to prevent the potential of leaks) and chain link fence as a safety precaution.

Average Flow 111 gpm

Average Water Chemistry – Pre-treatment:

pH 4.5
 Iron 25.0 mg/l
 Aluminum 17.0 mg/l
 Acidity 210.0 mg/l

Average Water Chemistry – Post treatment

pH 7.45
 Iron 0.11 mg/l
 Aluminum 0.23 mg/l
 Acidity -49.33 mg/l

Upstream Water Quality

pH 4.2
 Iron 0.57 mg/l
 Aluminum 3.92 mg/l
 Acidity 31.5 mg/l

Downstream Water Quality

pH 6.0
 Iron 0.51 mg/l
 Aluminum 2.14 mg/l
 Acidity 5.7 mg/l

South Tributary – Two mine openings were combined into one pipe to treat the discharges with an anoxic limestone drain. Unfortunately about two years after construction the system began to fail due to a significant change in water chemistry. In the fall of 2002 the existing system underwent a significant modification into a vertical flow system and has since been operating properly. In addition a 300 foot section of stream had additional limestone placed within the channel to add alkalinity to the watershed. The system includes an initial sediment basin, a vertical flow treatment pond and a final settling basin. The post treatment water quality data is reflective of the average water chemistry observed since 2003.

Average Flow 25 gpm

Average Water Chemistry – Pre-treatment:

pH 5.5
 Iron 12.9 mg/l
 Aluminum 1.0 mg/l
 Acidity 30.0 mg/l

Average Water Chemistry – Post treatment

pH 7.78
 Iron 0.57 mg/l
 Al 0.05 mg/l (below detection limits)
 Acidity -75.0 mg/l

Upstream Water Quality

pH 6.4
 Iron 0.06 mg/l
 Aluminum 0.09 mg/l
 Acidity -0.56 mg/l

Downstream Water Quality

pH 6.7
 Iron 0.10 mg/l
 Aluminum 0.08 mg/l
 Acidity -16.77 mg/l

Spaghetti Hole – Is a large volume discharge treated using a vertical flow treatment system. The system includes an initial sediment basin, vertical flow treatment pond and final settling basin

Average Flow 105 gpm

Average Water Chemistry – Pre-treatment:

pH	3.34
Iron	2.0 mg/l
Aluminum	8.5 mg/l
Acidity	80.0 mg/

Average Water Chemistry – Post treatment

pH	7.36
Iron	0.34 mg/l
Aluminum	0.18 mg/l
Acidity	-138 mg/l

Squatter Falls – The mine opening for this site was exposed to allow for free flow into the initial pond containing limestone rock, the flow then exits through a limestone channel into a wetland; the wetland then discharges into a Pyrolusite bed. The Pyrolusite bed uses microbial activity to create an environment of high pH. This environment aids in the precipitation process of manganese.

Average Flow 67 gpm

Average Water Chemistry – Pre-treatment:

pH	3.75
Iron	96.0 mg/l
Aluminum	1.0 mg/l
Acidity	188.0 mg/l

Average Water Chemistry – Post treatment

pH	7.30
Iron	0.24mg/l
Aluminum	0.20 mg/l
Acidity	-115 mg/