

Abandoned Mine Drainage (AMD)

Abandoned Mine Drainage (AMD) is drainage flowing from, or caused by, **deep mining, surface mining** or **coal refuse piles**. Drainage may be acidic or alkaline, with elevated levels of dissolved metals.

Where Does AMD Originate?

SURFACE MINING — past unregulated strip mining

DEEP MINING — underground tunnels

BORE HOLES— a hole drilled to relieve pressure in deep mines

REFUSE PILES— waste coal, otherwise known as bony piles



Boozer Discharge—Wells Creek

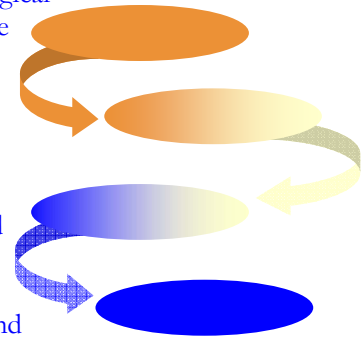
Photo by: Kiski-Conemaugh Stream Team

What are the Indicators of AMD?

1. Little or no evidence of aquatic life
2. Toxic chemical readings in the stream
3. Stream bottom coating
4. Stream discoloration
5. Colors that indicate metals are present:
 - orange→ evidence of iron
 - white/gray or blue → evidence of aluminum
 - black→ evidence of manganese

How is AMD Treated?

1. *ACTIVE TREATMENT* – Acidic discharges are neutralized by the addition of strong alkaline chemicals such as: lime or ammonia. These systems may need less capital to build, but more funding for operation and maintenance.
2. *PASSIVE TREATMENT* – Naturally occurring chemical and biological reactions are established in a controlled environment. Typically, these systems require more capital to build, but less funding for operation and maintenance.
 - How do Passive Treatment Systems work?
AMD passes through one or several of these systems:
 - wetlands - including marshes, swamps, or bogs
 - open limestone channels- ditches lined with limestone sand
 - anoxic limestone drains– beds of buried limestone that intercept subsurface mine water
 - vertical flow reactor– AMD is directed through compost and limestone
3. *LAND RECLAMATION* – Restoring an area scarred by mining to a more natural state. This usually involves the elimination of dangerous highwalls, AMD, clogged streams, and hazardous water bodies. The site will usually be graded to a gentler slope and then vegetated with native plants.
4. *COAL REFUSE REMOVAL AND UTILIZATION*— Coal Refuse piles (bony) will be tested for energy use and if found to be suitable, it may be removed and utilized by an energy producing company. By removing coal refuse from the watershed, a source of AMD will also be removed.
5. *REMINING*— Opening an abandoned mine in order to remove additional quantities of coal and waste rock that cause AMD to form. The new operation will be governed by the existing mining regulations.



The goal of AMD treatment is to restore streams to their natural state. Monitoring the chemistry, aquatic life, and stream flow rates before and after treatment allows sites to be evaluated and properly treated. It also offers many opportunities to volunteer and learn about our environment.

How Can You Help?

Ask questions and volunteer for watershed associations and local government agencies that deal with stream restoration. For more information, contact the **Kiski-Conemaugh Stream Team** at: (814)-532-5049 or visit the website: www.kcstreamteam.org/partners.

