# Reclaiming Abandoned Mine Lands

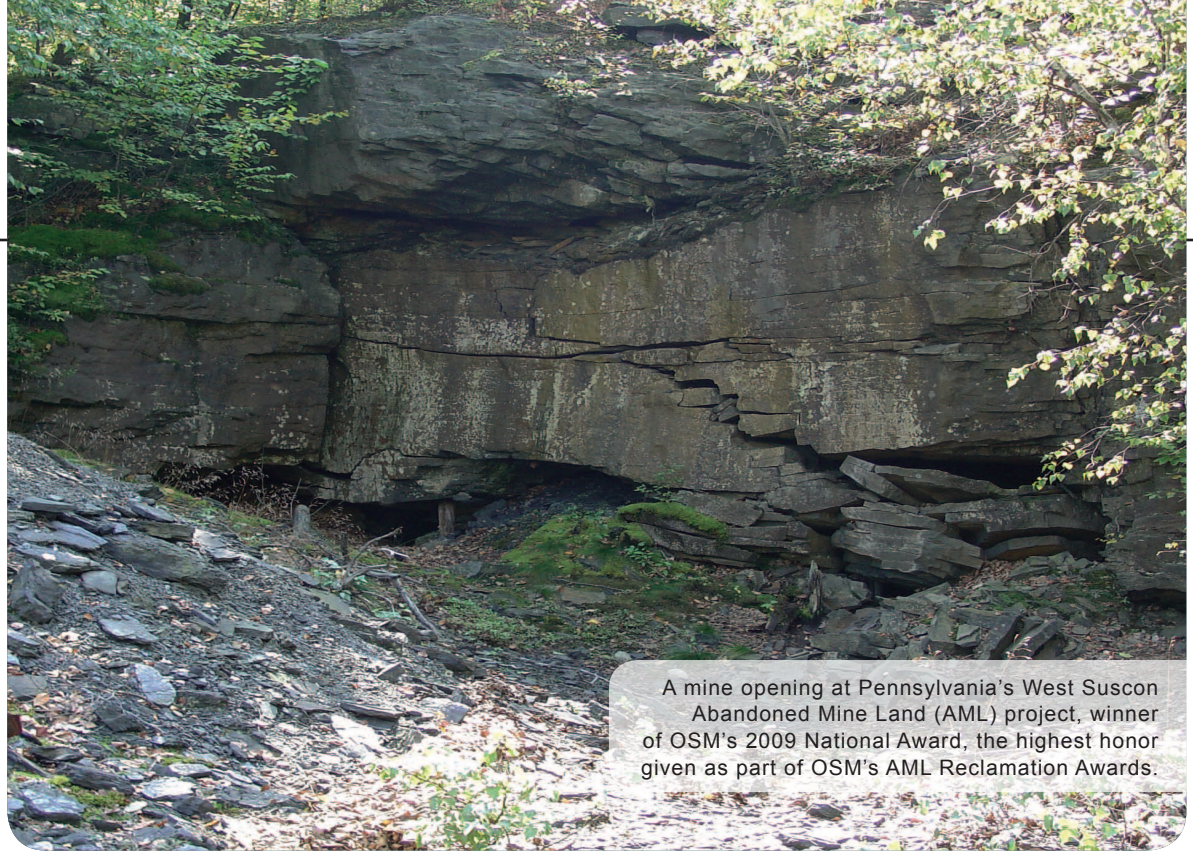
The Abandoned Mine Land Reclamation Program is one of OSM's primary responsibilities under SMCRA and OSM's largest program. Over the past 33 years, the AML program has collected more than $9 billion in coal production fees and invested over $6.5 billion in grants to states and tribes to reclaim the lands and waters damaged by coal mining before it began to be regulated under SMCRA in 1977.

The AML program addresses hazards and environmental problems associated with abandoned mine lands, including subsidence of land affecting homes and communities, open entrances to abandoned mines, dangerous highwalls, surface and ground water pollution, damage from landslides, and toxic fumes and unstable land resulting from coal mine fires and burning coal refuse.

The AML program also seeks to assist community improvement and watershed groups in their efforts to address local challenges within their communities. As part of its Watershed Assistance efforts, OSM created a partnership with Volunteers in Service to America (VISTA) to bring college-educated OSM/VISTA workers to local communities that experience the adverse impacts of pre-SMCRA mining. These OSM/VISTAs work in the communities for a year, on a full-time basis. OSM also assists in supporting a Summer Internship program, placing college students for eight or ten weeks with sponsoring community watershed improvement groups (photo below).

Despite the AML program's long and successful history, the dangers associated with unreclaimed coal mines are still present. Many states have inventories of problems that will exceed the funding available to them. For instance, Kentucky, Pennsylvania and West Virginia have so many AML-related problems that each of them could spend all of the AML funds collected and still not complete their projects.

In West Virginia, participants in OSM's partnership with Volunteers in Service to America sample a stream for the presence of aquatic insects, useful indicators of water quality.



A mine opening at Pennsylvania's West Suscon Abandoned Mine Land (AML) project, winner of OSM's 2009 National Award, the highest honor given as part of OSM's AML Reclamation Awards.

The identification of AML-related problems continues to increase. OSM and its state and tribal partners are aware of problems in mined areas that are not listed in the AML inventory because they do not currently present a danger to life or property. However, as new subsidence events occur or people move closer to abandoned mines, these sites will become reclamation priorities.

What follows are just a few examples of the bureau's work in 2009 to continue its ongoing effort to clean up pre-SMCRA mine sites, and to address emergencies related to mine reclamation.

## 2009 AML Reclamation Award Winners

In 1992, OSM began recognizing outstanding examples of abandoned mine reclamation work and innovation in reclamation techniques. The annual AML Reclamation Awards are given for all types of reclamation work, including coal, non-coal and emergency programs that are fully or partially funded and completed by approved state or tribal programs. The awards are given after a panel of state reclamation program directors and OSM managers vote to determine the winners.

### The National Award

#### Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation

*West Suscon Abandoned Mine Reclamation, Jenkins Township, Luzerne County, Pennsylvania*

Scarred with features such as dangerous highwalls, open mine shafts, and acid mine drainage that degraded local water quality, the West Suscon project was a typical example of an abandoned coal mine (photo above). Challenges at this site in northeastern Pennsylvania included eliminating health and safety problems associated with the highwalls, controlling drainage, and preventing access to the abandoned underground mine openings while protecting the area's bat population. Operators graded the entire area so that it would

blend in with the surrounding landscape and be developed in the future. The area is now the site of an office park with several commercial tenants.

## Small Project Awards

Small project awards are reserved for states and tribes receiving less than $6 million annually in AML funding and for projects under $1 million.

### Iowa Abandoned Mine Land Program, Mines and Minerals Bureau

*Waal West Reclamation Project, Section II, Mahaska County, Iowa*

This abandoned mine site was last mined in the 1960s, with mostly barren spoil piles and sparse vegetation left behind. It consisted of a sediment-clogged stream, a hazardous water body, and industrial and residential waste. The State of Iowa, local government, and private citizens succeeded in establishing a wetland and enhancing an existing wetland. An embankment created on the downstream end of the existing wetland allows water to be retained in the area for a longer time, thereby improving the quality of the entire wetland area and pond.

### Alaska Department of Natural Resources, AML Program

*Suntrana Tipple AML Project, Healy Creek Valley, Alaska*

The Suntrana Tipple project (photo below) site was littered with power transformers,

Testing for evidence of PCBs at Suntrana Tipple Reclamation Project, Healey Creek Valley, Alaska.


Water sampling and analysis at the Belden Acid Mine Drainage reclamation project in Carroll County, Ohio.

partially filled diesel storage tanks, and buildings containing trash and hazardous materials. Flash floods, high winds, and other factors created special risks and unknown expense factors for the contractors working at the site. Alaska DNR demolished all of the onsite buildings and mitigated the contaminants found on the site, including hydrocarbons and polychlorinated biphenyls. The Alaska Department of Environmental Conservation subsequently issued a clearance for this site.

## The Appalachian Regional Award

Ohio Department of Natural Resources, Division of Mineral Resources Management

*Belden AMD Reclamation Project, Carroll County, Ohio*

The Belden site (photo above) is one of eight stream reaches along Huff Run that the Ohio Department of Natural Resources has identified for eventual reclamation. The current project has restored about 4,000 feet of surface waters affecting two streams in the Huff Run watershed, primarily to benefits aquatic insects and na-

tive fish such as darters and catfish, which once occurred throughout the watershed. The early results are promising: the discharge of iron and aluminum measured at the project's retention pond has decreased from seven pounds per day to less than a pound per day, which should ultimately reduce the water treatment costs that local municipalities face each year.

## The Mid-Continent Regional Award

### Railroad Commission of Texas, Surface Mining and Reclamation Division

*Mabel New-Superior AML Reclamation Project, Live Oak County, Texas*

The Mabel New-Superior open-pit uranium mine site was last operated in the 1960's, and it left behind more than 11,000 linear feet of highwalls. In addition, abandoned spoil and low-quality ore adjacent to the pits presented a radiation hazard. To remedy the situation, contractors eliminated the dangerous highwalls, graded the site to a stable topography, and buried the radioactive materials in the pit bottom. As a result, post-reclamation radiation readings are lower than estimated pre-clean-up readings in about 70 percent of the project area.

## The Western Regional Award

### Colorado Division of Reclamation, Mining and Safety, Inactive Reclamation Program

*Millsap Creek Tailings Reclamation Project, Teller County, Colorado*

By the late 1990's, 45 acres of sandy refuse material from an abandoned gold mine had washed down Millsap Creek in central Colorado, causing severe sedimentation into a tributary of the Arkansas River. The State of Colorado partnered with the Bureau of Land Management, local government, private landowners, and industry to finance and then reclaim the Millsap Creek Tailings. Reclamation work included excavation and re-grading 320,000 cubic yards of tailings, hauling and spreading 60,000 cubic yards of cover soils and rock to stabilize the site, and mulching, seeding, and revegetating the reclaimed area.

## 2009 AML Grant Amounts

On December 15, 2008, OSM announced it would provide $298 million in Fiscal Year 2009 grants to states and tribes to restore abandoned mine lands, treat water quality problems associated with past mining, and, in some cases, put to other uses. The grants increased about $24 million from the amounts available in Fiscal Year 2008.

States and tribes may use AML funds to eliminate health, safety, and environmental problems caused by past mining practices, improve water quality by treating acid mine drainage, and other uses.

The 2006 amendments to SMCRA provide that, in addition to the funds distributed to eligible states and tribes based on AML fee collections from coal production in Fiscal Year 2008, each state and tribe will receive the equivalent of one-seventh of its unappropriated state or tribal share balance from Treasury funds.

The amendments also direct Treasury funds to certified states and Indian tribes, or those that no longer have coal reclamation projects to address, that are no longer eligible for funds from AML fee collections.

## Fiscal Year 2009 Abandoned Mine Land Grant Amounts

### Certified States/Tribes

Louisiana $ 289,586

Montana $ 9,547,050

Texas $ 3,781,470

Wyoming $100,783,068

Crow Tribe $ 1,580,977

Hopi Tribe $ 968,045

Navajo Nation $ 5,851,308

### Uncertified States/Tribes

Alabama $ 5,471,464

Alaska $ 1,723,541

Arkansas $ 1,569,094

Colorado $ 6,485,403

Illinois $ 11,356,792

Indiana $ 10,546,634

Iowa $ 1,724,386

Kansas $ 1,725,188

Kentucky $ 31,184,323

Maryland $ 2,085,185

Mississippi $ 210,739

Missouri $ 1,807,121

New Mexico $ 3,823,848

North Dakota $ 2,937,279

Ohio $ 8,376,067

Oklahoma $ 1,850,042

Pennsylvania $ 29,975,292

Tennessee $ 1,896,843

Utah $ 3,620,533

Virginia $ 7,022,985

West Virginia $ 39,878,051

These Treasury funds are based upon the amount of fees collected within state or tribal boundaries during Fiscal Year 2008. The amount of AML funding distributed in Fiscal Year '09 is depicted to the left.

## Deluge on Mother's Day, OSM's AML Program Responds in Troubled Times

For many locations, 2009 proved to be a drought year, but not in the Appalachian region, and especially not in the Ashland, Kentucky, area. The unusually wet weather in winter and early spring 2009 triggered dozens of emergency-related mine reclamation complaints, putting a strain on OSM's Ashland office, which had about 40 percent fewer workers available due to retirements, attrition, and other staff changes.

The Ashland office is responsible for handling emergency AML complaints in Kentucky. Normally, it receives a few hundred AML complaints each year, and after evaluating them to see if they fit the criteria, it will handle an average of 65 to 70 complaints in a fiscal year. Of those, about 18 to 20 are attributed to severe weather in a typical year. As OSM staff would discover, 2009 was not a typical year.

On May 9th and 10th, Mother's Day weekend, a series of thunderstorms raged in the Ashland area. Those storms dumped more than four inches of rain in a very short time, compounding a difficult situation because of the already saturated ground. To make matters even worse, for the next two weeks after that, a "train" of similar storms passed over eastern Kentucky, washing

A landslide from the Mother's Day thunderstorms that occurred in and around Ashland, Kentucky. OSM staff responded swiftly to a record number of claims, saving dozens of homes and businesses.

out rivers, streams, and creeks, and taking out roads and bridges, leaving many rural communities cut off and isolated.

The storms prompted Governor Steve Beshear to declare most of southeastern Kentucky a disaster area.

When the storms passed, and citizens surveyed what was left, it was up to OSM to respond to one of the biggest calls to action the Ashland office had ever seen – and to handle it quickly.

The Ashland office received 42 storm-related complaints in less than three weeks after the first storm, 40 of which focused on mine drainage, flooding and large landslides that threatened homes, businesses, churches and public roads. OSM's AML program has a stated goal of visiting and evaluating a potential AML claim within 48 hours of its receipt, and then to quickly design, contract and implement the remedy to protect public health, safety and welfare.

However, receiving so many complaints at one time put that goal beyond the ability of the office to handle alone.

OSM's managers called for help and received it in short order. OSM offices in other Appalachian states sent additional staff who worked nights and weekends to address the situation.

In the end, OSM declared 30 of the 42 complaints as AML emergency sites, with all 30 projects addressed and completed within 60 days. Because of OSM's quick response, dozens of homes and businesses were saved from damage or destruction.

As a result of the Mother's Day deluge, the Ashland office handled the fourth-largest number of AML annual complaints in its history. It successfully evaluated those storm-related problems and abated them faster than many people thought possible.

## Airport Mine Fire, Allegheny County, Pennsylvania

Imagine for a moment the chaos that would ensue if the 47th busiest airport in America came to a grinding halt, or even if the pace and tempo of the 200 flights each day was restricted for one day.

Many passengers would miss connecting flights, and subsequent business or personal meetings. If the problem continued for a year, nearly nine million passengers and almost 170,000 takeoffs and landings would suffer an impact of some type.

Without some much-needed help from OSM and the Pennsylvania Department of Environmental Protection, Pittsburgh International Airport would have suffered such a degree of disruption. With nearly nine million passengers and almost 170,000 takeoffs and landings each year, the airport is a major transportation hub.

The airport's midrange radar tower is about one mile south of the terminal, sitting on top of an abandoned mine site. On June 3, 2008, the airport authority contacted OSM, saying the old mine site was on fire and that the authority was unable to suppress the flames. The fire presented a major problem because it was burning near the radar tower.

From June through December 2008, OSM staffers used a variety of computer applications and both GPS and geospatial imaging systems to explore and map the



A panoramic view of the area affected by the Airport Mine Fire. Note the depth of the trench in the upper left hand corner, (inset) as compared to the OSM staffer standing above.

area. They discovered a four-acre area rich with blocks of coal buried in the spoil of the original mine, and determined a large fire was indeed burning.

After performing more engineering studies on the area, the Abandoned Mine Reclamation team decided to isolate the underground fire by digging a 475-foot trench. They backfilled the trench with clay, extinguished or capped the fire where possible, and left the trench open to prevent the remaining underground fire from migrating to the tower area.

The major portion of the work was completed in October 2009, and the Pennsylvania Department of Environmental protection has taken over the role of monitoring the flames while planning to eventually put the fire out. Overall, the project cost about $370,000 to complete.

Thanks to the swift intervention of OSM and the Commonwealth of Pennsylvania, Pittsburgh International Airport was able to avoid a disaster that would have had a major impact on the Nation.

## OSM's Mid-Continent Region Responds to One of the Largest AML Emergencies in Oklahoma State History

Oklahoma was once home to a thriving, booming coal mining industry, but in the four decades since the boom, people living there have learned the hard way about the dangers of mine subsidence. It is a widespread problem that not only affects homeowners, but even people trying to travel on the roads.

In 2009, a mine subsidence incident that grew quickly would have stopped traffic if OSM's Mid-Continent Region, the Oklahoma Department of Transportation, and the Oklahoma Conservation Commission had not intervened.

U.S. Highway 270 in Alderson, Oklahoma, had experienced minor problems with mine subsidence beginning in 2006. By late 2009, the state had patched nearly 1,100 feet of asphalt due to minor cave-ins. The problem eventually grew to the point where it forced the State of Oklahoma and OSM to declare an emergency, likely the largest single AML emergency project in state history.

No one knew the full extent of the problem until OSM staff members collaborated with the state Department of Transportation to drill exploratory holes into the areas beneath the highway surface. From there, OSM staff used a state-of-the-art borehole camera system that provides both black and white and color high-resolution photos and video of what lies beneath, even to a depth of 1,000 feet.

The Oklahoma Conservation Commission took the information from the borehole cameras to identify the depth and extent of the voids under the highway. What they discovered were holes as much as 23 feet deep from a mine dating back to the early 1900s. These voids can become dangerous when the mine support structures wear

out and collapse, causing the upper levels to sink as well.

From there, the Oklahoma Conservation Commission contracted with a local company to pump a concrete grout mixture into the voids to prevent more subsidence. The total cost for the project was more than $800,000. To place this in context, most emergency subsidence projects in Oklahoma cost between $8,000 and $12,000.

Today, more than 11,000 drivers each day pass over that section of U.S. Highway 270, and most drivers have no idea what was needed to ensure their safety. For OSM, it also shows how well the Federal program works with state and local governments to abate problems associated with pre-SMCRA mining.

Oklahoma workers used the borehole camera provided by OSM to determine the depth and extent of the subsidence before making the necessary repairs.