



2015 Abandoned Mine Land Reclamation Awards Nomination Form



Name and Location of the Nominated Reclamation Project:

SIMPSON NORTHEAST COAL REFUSE FIRE, Fell Township, Lackawanna County, PA

Award Category:

- National Award Small Projects National Award
 Appalachian Region Mid-Continent Region Western Region

Information on Person(s) Submitting the Nomination:

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Project Start Date: December 15, 2013

Project Completion Date: May 28, 2014

Construction Costs: \$2,213,477.80

Names of Organizations Responsible for the Reclamation, Including Contractors:

PA DEP BAMR, Minichi Environmental/Minichi Inc.

Date Submitted: April 10, 2015

The following page contains information on the required narrative and photography format.

Please go to www.osmre.gov/programs/awards/AML Awards.shtm for specific information on the nomination process and where to submit your nomination.

SIMPSON NORTHEAST COAL REFUSE FIRE OSM 35(4294)101.1



Abandoned
Mine Land



Reclamation
AWARDS



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Bureau of Abandoned
Mine Reclamation**

SIMPSON NORTHEAST COAL REFUSE FIRE
ACCELERATED RESPONSE ABANDONED MINE RECLAMATION PROJECT
CONTRACT OSM 35(4294)101.1

LOCATION

Fell Township, Lackawanna County, Pennsylvania

SUBMITTED BY

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PROJECT TEAM

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Victor Gazella, Dave Jansson, Joe Kasulaitis, Paul Kinder, Jack Lee, Tom Ludka, Bill Richards,
Rick Ruggiero, Ruth Scotti, Terry Shaffer, Bernie Walko

TIMELINE

Fire Reported: December 15, 2013
Construction Started: January 16, 2014
Construction Completed: May 28, 2014

CONSTRUCTION COST

\$2,213,477.80

PROJECT PARTNERS

U.S. Department of Interior, Office of Surface Mining – Funding and Oversight
PADEP BAMR – Development, Design and Construction Management
Susquehanna River Basin Commission – Water Withdrawal Permit
D&L Realty – Property Owner
Tri-County Sportsmen’s Association – Lessor

CONTRACTOR

Minichi Environmental/Minichi, Inc., Dupont PA 18641-1947

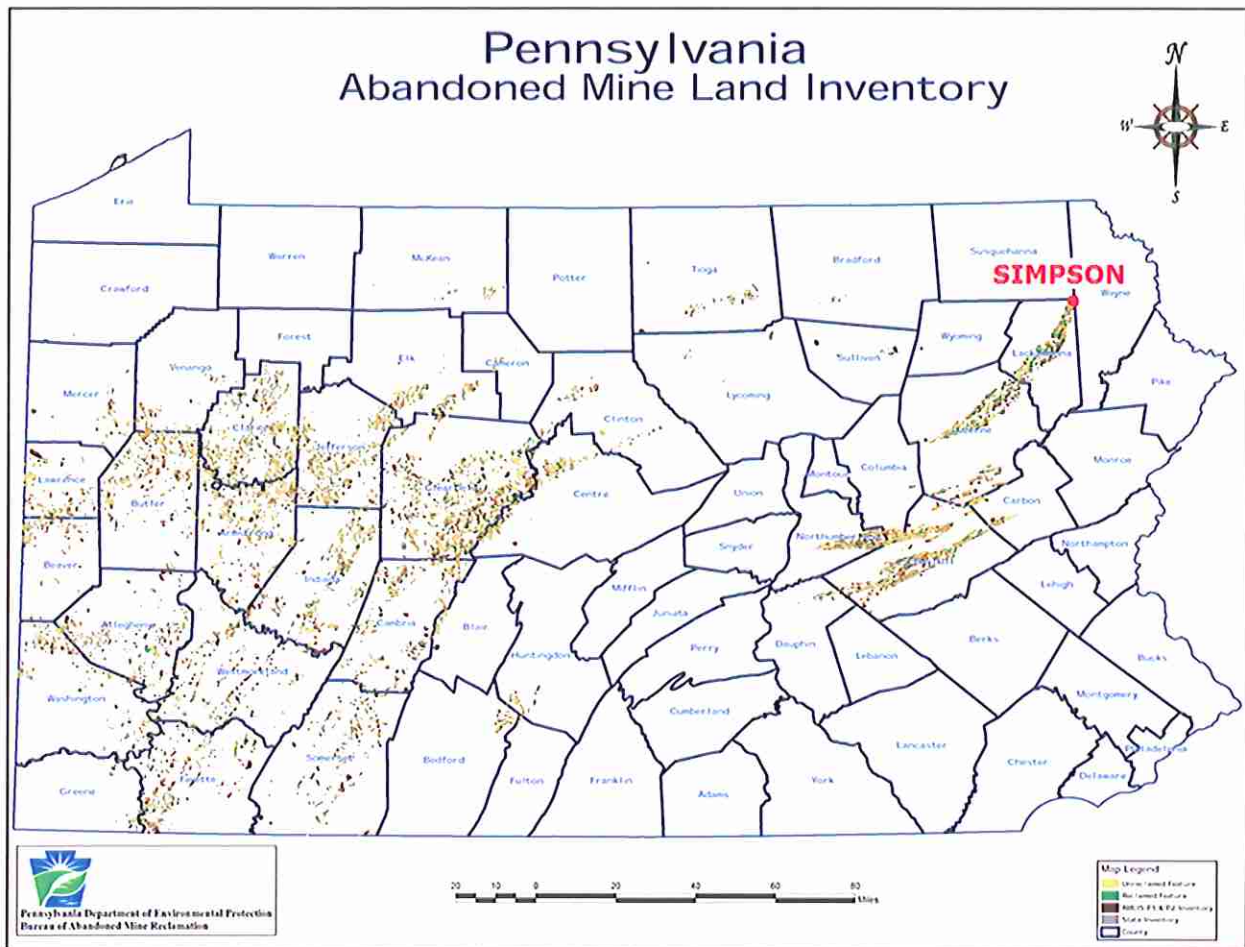
DATE SUBMITTED

April 10, 2015

SIMPSON NORTHEAST COAL REFUSE FIRE

Introduction

In early 2014, the Pennsylvania Department of Environmental Protection (PADEP) Bureau of Abandoned Mine Reclamation (BAMR) Wilkes-Barre District Office (WBDO) excavated and extinguished a coal refuse bank fire on abandoned mine lands 20 miles north of Scranton, PA.

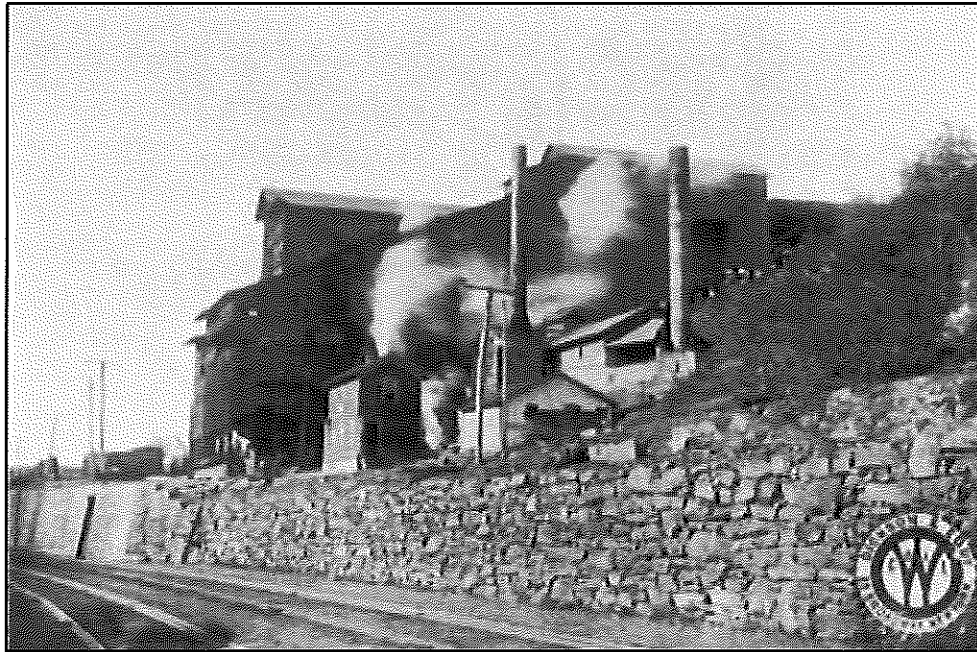


Location of Simpson Northeast Project – PADEP BAMR

Historically, burning coal refuse fires were considered unavoidable by-products of mining. Pennsylvania's early steps to address coal refuse fires occurred in 1968 with the passage of laws requiring operators to extinguish the fires, and allocating funds to address abandoned coal refuse fires. These laws and subsequent legislation, including the Surface Mining Control and Reclamation Act of 1977 (SMCRA), have much improved upon the problem, but abandoned refuse piles still dot the landscape in coal country. Fires in these abandoned refuse piles have burned in the past and will burn in the future, until the piles are removed.

The battle to extinguish this fire occurred during the heart of one of the coldest winters to hit the region. Shortly after excavation of the refuse pile commenced it was apparent the fire was much larger than anyone anticipated. After 111 days – nearly four months of continuous work, the fire was finally extinguished.

This coal refuse fire was located within a large coal refuse bank approximately 1,200 feet east of Jefferson Street in Fell Township, Lackawanna County, Pennsylvania, about one-quarter mile from the Lackawanna River. Refuse had been deposited from the Simpson Colliery and Northwest Coal Company Breaker, which had been operated by several companies on the site between 1885 and 1964. The majority of material came from deep mining but there was some strip mining performed in the 1950s and early 1960s.



Northwest Coal Breaker, ca. 1890 - Ontario & Western Railway Historical Society Collection

The project eliminated a public safety hazard by extinguishing the coal refuse bank fire. Residents over two miles away were complaining of smoke and odor. The area is easily accessible via dirt roads and foot trails. There are many indications - such as tire tracks, garbage and YouTube videos - that people frequent the area. The local volunteer fire company had fought several brushfires in the proximity during past years, and locals claimed the fire may have been ignited by ATV riders burning “15 tires” on the spoil bank. There also were reports that it had been smoking for some time, perhaps months, before it was reported to BAMR.

The project involved establishing a water supply, installing erosion and sedimentation (E&S) controls, and excavating and quenching the burning refuse. Upon completion of quenching the fire, the disturbed areas were graded, seeded, and the equipment demobilized. The project was reported on December 15, 2013, and was completed on May 28, 2014 at a cost of \$2,213,477.80.

Difficulty of Achieving Reclamation under Existing Conditions

Special and Unique Considerations

During the initial investigation, a “Fell Coal Company” sign was observed at the end of the access road. This company had a permit to re-mine refuse in the area in 2001 but the property owner stated that the area of the fire was not permitted or bonded. This was confirmed by consultation with Title V PADEP personnel in the Pottsville District Mining Office and Abandoned Mine Land (AML) funding eligibility was established.



Simpson Refuse Fire January 9, 2014 – PADEP BAMR

The initial investigation by BAMR revealed a surface expression area (steaming ground and no snow cover) of approximately 120 feet by 120 feet. The height of the refuse bank was estimated to be 100 feet high, covering approximately four acres and situated on the north side of a much larger coal refuse area. The size of the refuse bank and fire were unknown. It was initially anticipated that approximately 50,000 cubic yards (CY) of hot material would need to be excavated and quenched to extinguish the fire, while the actual quantity was 285,000 CY.

Mine maps contiguous to the fire area are incomplete, and it was feared there was potential for the fire to spread beyond the immediate area underground. Several abandoned strip pits surrounded the refuse bank area. BAMR requested and was granted permission to utilize Commonwealth of Pennsylvania emergency contracting procedures.

In the area of this project, the Lackawanna River is considered a High Quality Cold Water Fishery for which PADEP requires an individual National Pollutant Discharge Elimination System permit; more stringent E&S control measures and devices and additional discharge water quality monitoring.

The Lackawanna River is part of the Susquehanna River Watershed. The Susquehanna River Basin Commission (SRBC) regulates water withdrawals for uses of more than 20,000 gallons per day, and meets quarterly to consider these requests. A request for an emergency withdrawal permit was necessary, and was made and granted.

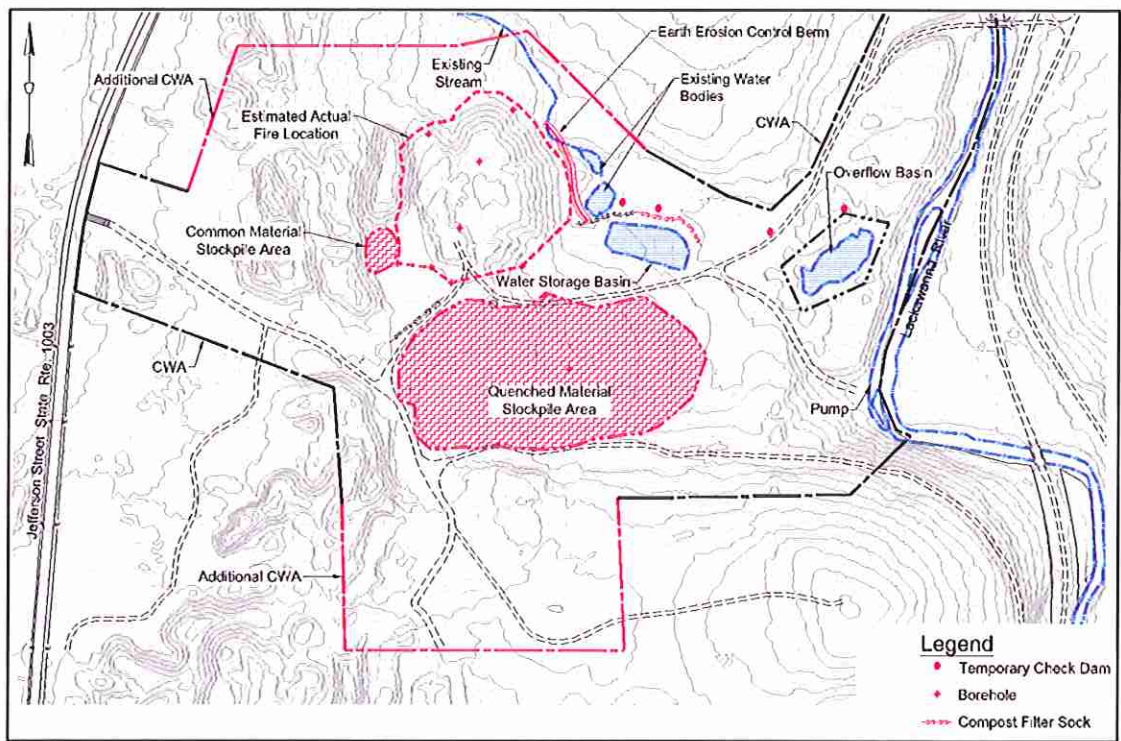
The United States Army Corps of Engineers (USACE) made a determination through an Emergency Joint Permit that putting a hose/pump through the flood plain and into the river would not constitute a stream encroachment. Fellows Creek, an intermittent tributary to the Lackawanna River, was down slope and to the east of the refuse bank. A portion of the site adjacent to Fellows Creek is a waterbody that qualified for a waiver of Pennsylvania waterways

obstructions and encroachments permit requirements because of its size and poor water quality (3 pH and high iron and manganese).

An Environmental Assessment included the PADEP, SRBC and USACE permitting above, a Pennsylvania Natural Diversity Inventory Environmental Review, and consultations with the State Historic Preservation Office, U.S. Fish & Wildlife Service, and the Pennsylvania Fish and Boat Commission. These permits and permissions, including an Office of Surface Mining (OSM) Authorization to Proceed were obtained by January 8, 2014.

On-Site Difficulty of the Project

On January 9, 2014 a pre-bid meeting was held at the site, with bids opened on January 15. The contract was awarded to Minichi Construction, the low bidder. Minichi is a contractor with known mine fire-fighting experience and they began work the following day, starting to install a pump and a waterline from the river.



As-Built Drawing of Simpson Coal Refuse Bank Site – PADEP BAMR

The design of this project included constructing a cut off trench on the western side and up-slope from the fire, while working down to natural ground and progressing towards the fire in benches. This was done to isolate the fire from the closest coal seam outcrop in an unreclaimed stripping pit and from a large area of coal refuse to the north.

Fellows Creek had to be protected from runoff resulting from the quenching operation. An erosion control berm/ditch was constructed at the base of the eastern side of the refuse bank and was sloped to drain into a sedimentation pond constructed some 200 feet from the fire area that would then discharge into the tributary. Fellows Creek discharges into an abandoned sedimentation pond existing from earlier refuse bank remining. That pond water seeps through a spoil bank into the Lackawanna River. As part of the emergency withdrawal permitting, water temperatures and quality were monitored both above and below the project. The runoff from

water sprayed on the fire was to be captured and reused, minimizing the withdrawal and potential impacts to the river.



Pump Suction in 32°F Lackawanna River January 2014 – PADEP BAMR

Once a water supply was established, the contractor began spraying water on the fire, while the proposed area for the isolation trench was cleared and grubbed. Excavation and quenching of material began on the south side of the fire and proceeded to the northwest. Temperatures of the quenched material were monitored and maintained below 100°F. The contractor excavated a trench six feet deep and ten feet wide, with a 200-foot diameter, encircling the hottest part of the fire (1200°F) on the top of the refuse bank. Putting water in that trench provided a “water curtain” around the fire. The contractor maintained a +500 gallon per minute (GPM) stream of water at each work station on the site and quenched the hot material in a pond at each of those stations, loading only material cooler than 100°F.



Simpson Refuse Fire February 2014 – Chris Murley, www.ironminers.com/mineforum

As the project progressed, extreme cold weather (Jan 21-Feb 21, 2014 consisted of only two days with above average temperatures, ten days with lows in the single digits, and temps as low as minus 6°F). The resulting frozen water lines necessitated 24-hour pumping from the 32°F Lackawanna River. A withdrawal permit for one million gallons per day (MGD) with an instantaneous pumping rate of 1,400 GPM was approved by SRBC on January 8. On February 4, a modification to increase the withdrawal rate to 2,800 GPM and a maximum withdrawal quantity of up to two MGD was requested and granted. Total water usage withdrawn from the river and recycled was 156 million gallons, eight times BAMR’s preliminary estimate.

While the isolation trench was being installed, the fire jumped to the “cold side” of the trench and threatened to burn to the coal outcrop. The contractor concentrated quenching work exclusively on the area near that crop. Cool hole drilling encircling the evident fire area to ascertain the depth of the refuse bank and to monitor movement of the fire was done at that time. Excavation eventually proceeded outward to almost all the cool holes.

The increased runoff associated with the quenching operation and the friable nature of the refuse material created concerns about sediment issues. Temporary rock check dams were installed at various locations in Fellows Creek, after obtaining another waterways permit waiver. The expanding refuse fire also threatened to expand under several site water bodies and perhaps under the tributary east of the refuse bank. Additional permitting was approved, increasing the footprint of the project from seven to seventeen acres for additional dump space, and an Emergency Permit to affect the wetlands and tributary. Additional discussions with the USACE also took place for this option. This precaution proved to be unnecessary.

On-Site Effectiveness

Effective use of Technology

Two separate measures were utilized to maximize the efficiency of the water used on the fire – recycling as much water as possible as described above and using foam at the hot workstations.

Class A foams were developed in the mid-1980s for fighting wildfires. Class A foams lower the surface tension of the water, which assists in the wetting and saturation of Class A fuels (ordinary combustibles such as wood, paper, fabric, plastic, and most kinds of trash) with water, aiding fire suppression and preventing re-ignition. The foam used at Simpson was on the U.S. Forest Service approved products list for wildland foams, and met the requirements of the National Fire Protection Association Standard on Fire Fighting Foam Chemicals for Class A Fuels in Rural, Suburban and Vegetated Areas. The foam did not contain components included on traditional federal regulatory management lists such as the EPA Toxics Release Inventory list or the CERCLA Spill List, to keep the trout in the river unharmed.



**Spraying Foam on Hot Refuse, March 2014
– Scranton Times-Tribune**

Because of the porosity of the refuse bank material, most of the runoff was not held in the constructed settling pond. Rock check dams and 12-inch diameter compost silt socks were used to slow and direct the water toward the lower settling pond. The check dams did a good job of slowing and ponding the water, allowing the sediment to drop out and the lower, pre-existing settling pond to drain. One issue was encountered with the check dams - fine material on the sides eroded causing breaches and potential for silt discharges, requiring constant maintenance. FlocLogs[®] were placed on the outlet of the check dams to help settle out some of the black silts in the runoff. Silt-Stop[®] Powder, co-polymer erosion control material, was broadcast on the lower existing pond and on the ponds formed by the check dams, attempting to aid sediment settling, but with little effect. The logs provided the best results but the water had to be forced into a narrow channel to pass over the logs and be treated.



Simpson Coal Refuse Fire February 27 – Scranton Times-Tribune



Simpson Coal Refuse Fire March 12 – PA DEP BAMR



Simpson Coal Refuse Fire April 16 – PA DEP BAMR



Simpson Coal Refuse Fire Extinguished May 9 – PA DEP BAMR

Resulting Landscape Conforms to the Natural Environment

The Delaware & Hudson (D&H) and Ontario & Western (O&W) rail-trails run parallel and in close proximity between Simpson and Forest City, in sight of the Lackawanna River and through the area of the Simpson project. Trail hikers comment on the iron discoloration in the water, the mining scars, abandoned foundations of buildings, black refuse piles and extensive refuse flatlands along the unshaded river and trails in this area. The Lackawanna River Watershed Conservation Plan describes the area: “The Northwest Coal abandoned mineland and culm dump is problematic with AMD surface flows



D&H and O&W Trails near the Fire Site

and erosion of refuse during high flow periods and illegal dumping of household and automotive wastes.” Reclamation of the site after the fire resulted in a significant improvement.



Applying Ag-Lime on Reclaimed Refuse Bank May 2014 – PADEP BAMR

Refuse and vegetated areas affected by the project were graded to blend into the unaffected existing contours, seeded, fertilized, limestone applied and mulched. Erosion and sediment pollution control items were removed when the work sites were stabilized and the silt socks were slit open and left in place to biodegrade. Grading during the work activity maintained positive drainage. Old erosion gullies were backfilled to the adjacent ground elevation and compacted to the extent possible by the practical use of available hauling and spreading equipment.

Elimination of Significant Health and Safety Problem

Although the fire came to BAMR’s attention in December 2013, it became apparent that the fire had been smoldering for some time, perhaps even years. There was no ash material near or on the surface of the dump, indicating that the fire may have been smoldering, air-starved for a long period based on previous experiences with refuse fires. These subsequently begin venting later, often attributed to exothermic sulfur “spontaneous combustion,” or perhaps buried hot ashes. The Fire was exhibiting venting recorded at 200°F at several locations, and had temperatures greater than 1000°F on top of the pile when excavation began.



Extent of Fire at first investigation December 2013 – PADEP BAMR

Ostensibly the fire would have extended to some 50 acres of abutting refuse, brush and trees, and continued to spread to several nearby coal outcrops if this project had not been completed.

The most notable public concern was smoke and gas. During the four months, complaints and concerns were received from the EPA, various local emergency management agencies and the public from as far as 10 miles from the fire site. During the height of the fire, PADEP's Northeast Regional Office (NERO) Air Quality staff monitored the perimeter of the project and within an 1½ square mile area near the site for any harmful gases. Results showed very low levels, with 54 parts per million (ppm) being the highest carbon monoxide (CO) reading 100 feet from the fire (most people will not experience any symptoms at CO levels below 70 ppm). There was also no hydrogen sulfide (H₂S) or methane (CH₄) readings, although "a sulfur smell was always present". The monitoring equipment to detect CO, carbon dioxide (CO₂) and sulfur oxides placed in the equipment cabs, and gas meters worn by workers and state inspectors did not indicate any dangerous levels, even while working in close proximity to the fire.



Smoke and fumes from Simpson Coal Refuse Fire, January 2014 – PADEP BAMR

Uncontrolled fires can persist for decades in coal refuse and waste piles. These piles have burned in the past, they are burning today and they will burn in the future. These fires pose multiple threats to the global environment due to the emission of uncontrolled, unmonitored pollutants, as described in the previous paragraph, as well as toxic organics, mercury, arsenic, selenium, and other toxic substances. There is little information regarding the contribution of coal and refuse fires to global atmospheric CO₂ levels, but it is potentially significant.

Funding

Effective Use of Funds

Most, but not all, of Pennsylvania's known abandoned refuse and mine fires have been addressed through previous project work, aimed at completely extinguishing the fire, if possible, or controlling the fire and removing the hazards associated with the continued burning. The most reliable, often the most expensive, mine and coal refuse fire extinguishment technique is

complete excavation. The configuration of the Simpson Refuse Fire, the adjoining refuse banks, and its location near coal outcrops made complete excavation the most viable technique available.

Leveraging – Use of Partners for Technology

BAMR's WBDO had never designed nor managed an accelerated response refuse fire. OSM had provided an emergency AML program under SMCRA Section 410 for coal mining AML emergencies until October 2010, and OSM's Wilkes-Barre office had provided engineering and construction for three refuse/pit fires in the previous five years, and provided consultant design and construction management for a \$22 million deep mine fire in that time period. Mine-fire experience by the BAMR WBDO dated to 1985, with only a few staff having construction experience with those fires and none with design experience. Due to this lack of recent experience, design and construction of the project was aided by methods developed and taught in the OSM National Technical Training Program (NTTP) *AML Design Workshop: Fires* and consultation with course instructors.

Benefits to the Community

Community Support for the Project

During the project, PADEP held an informational media event dealing with Pennsylvania abandoned mine fires and refuse fires. That event included a site visit to Fell Township by the press and several state legislative staff members. In addition, a visit to the project by public officials including the region's State Representative was hosted by PADEP, BAMR and the contractor.

The contractor's safety coordinator had regular contact with the curious public, and the NERO public service representative and BAMR staff members had regular telephone contact with concerned citizens who were overwhelmingly supportive of the Simpson Fire project.

Long-Term Benefits to the Community

Historically, burning coal refuse fires were considered unavoidable by-products of mining. Old mining handbooks often stated that "refuse dumps" should be located where fumes would not cause a public nuisance. In 1935, a Pennsylvania court testimony states in part, "every large coal mine in Western Pennsylvania has a burning gob pile and there is no known means of averting such a fire." In 1965, the US Bureau of Mines reported some 500 burning coal refuse fires in the United States, 142 of them in Pennsylvania.

Pennsylvania's early steps to address coal refuse fires occurred in 1968 with the passage of the Coal Refuse Disposal Control Act, which allowed state agencies to take actions to requiring operators to extinguish the fires, the first law in the United States to do this; and the Land and Water Conservation Act, a bond issue which became known as "Operation Scarlift". Operation Scarlift was a Pennsylvania program which operated in the 1960's and 1970's with the purpose to remediate ravages of land and water from historic mining practices. Over \$16 million was spent on twenty coal refuse fire projects and another \$21 million on nineteen deep mine fires in northeastern Pennsylvania.

The notoriety of the Centralia PA mine fire and its subsequent destruction of that community have made mine and coal refuse fire extinguishment a high priority in most coal communities in

Pennsylvania. BAMR has extinguished four abandoned coal refuse fires since January 2014, attempting to address these as they occur, reacting to the concerns of the community.

SMCRA

Exceeds the Spirit and Intent of SMCRA

Coal refuse (also called culm, gob or waste coal) is a combustible material containing a significant amount of carbonaceous material, found in refuse piles remaining at sites of past or abandoned coal mining operations. Abandoned coal refuse piles are an environmental concern due to water pollution (clogged streams, acid seepage and leachate production); land pollution (un-reclaimed and no vegetation because of low soil fertility); and air pollution (fugitive dust and refuse fires). These piles often are not high-priority AML features, and as such, are only reclaimed when they are adjacent to active projects on high-priority features.

In January 2015, Pennsylvania Senator Pat Toomey released a newsletter stating: “Pennsylvania has millions of tons of discarded coal refuse left behind by 19th and early 20th century mining operations. This coal refuse is now stacked in gigantic piles across our commonwealth, sometimes only a few hundred feet from homes. These piles pollute our streams with acidic runoff and sometimes catch on fire, emitting dangerous uncontrolled air pollutants and endangering public health. Fortunately, technology and innovation have led us to specially designed power plants to transform this coal refuse into energy. This process cleans up our rivers and streams by removing millions of tons of coal refuse from neighborhoods across the state... We need to keep these power plants operating to continue improving our environment, sustaining good paying jobs, and powering our economy.”



Senator Toomey with photo of Simpson - www.toomey.senate.gov

In Pennsylvania, since 1989, coal refuse-fired facilities have burned over 200 million tons of coal refuse, reclaimed more than eight thousand acres of AML, and improved water quality associated with these operations. These facilities provide environmental benefits by producing energy with modern air pollution controls and reclaiming land for productive use.

Many smaller refuse sites, similar to the Simpson refuse pile, are remote from existing refuse-fired power plants and many are low-BTU quality. The removal of these small, remote, refuse banks should be encouraged by making the permitting and related bonding easier to obtain in order to reclaim these sites, helping to ensure that coal refuse fires do not occur.

Increased Public awareness of SMCRA

The Simpson project received substantial media/press coverage from the Scranton/ Wilkes-Barre television stations (WNEP, WBRE and WYOU); newspapers (Carbondale *News*, Scranton *Times-Tribune*, Wilkes-Barre *Times-Leader* and Harrisburg *Patriot-News*); radio stations; the Associated Press and associated national coverage. Most reporting was quite positive and acknowledged funding by OSM/SMCRA. Exposure also highlighted the Stay Out - Stay Alive aspects of the refuse fire. Articles were also published in several monthly publications, the bi-weekly PADEP Newsletter and the Pennsylvania Environmental Digest.

The Simpson Coal Refuse Fire Project Team received the 2014 WBDO Teamwork Award for their exemplary problem-solving teamwork, giving SMCRA and the program additional recognition within PADEP.



Portion of Simpson Refuse Fire Project Team Receiving 2014 WBDO Teamwork Award - PADEP

Transferability of practice to other AML projects

Some of the lessons learned through the Simpson Coal Refuse Fire project have been incorporated into the NTPP *AML Design Workshop: Fires* curriculum. In fact, the class was taught in Wilkes-Barre last year, and the students were able to visit the project site. The WBDO BAMR has since utilized lessons learned at Simpson in excavating and extinguishing another coal refuse fire in a neighboring community.

The hard work of the contractor and the BAMR staff, the learning experience including some of the missteps should be shared with others who work with abandoned mines.