

Department of Labor • Mine Safety and Health Administration • Joseph A. Holmes Safety Association

# JAHSA Bulletin

NOVEMBER-DECEMBER 2008



*'Tis the Season to be Safe*

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The Department of Labor, Mine Safety and Health Administration and Joseph A. Holmes Safety Association Bulletin contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters, and other health and safety-related topics. This information is provided free of charge and is designed to assist in presentations to groups of mine and plant workers during on-the-job safety meetings. For more information, visit the MSHA home page at [www.msha.gov](http://www.msha.gov).

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# It's Still the Season for Winter Alert; Don't Forget It!

## Winter Alert 2008

### "Score with Winter Alert - Sack Winter Hazards"

"Winter weather creates certain safety hazards that can affect working conditions at U.S. mines; therefore, it is imperative that hazards are identified and minimized or removed to ensure a safe workplace for all miners," said Richard E. Stickler, Acting Assistant Secretary of Labor for Mine Safety and Health. "Miners and mine operators must be vigilant to safety principles during wintertime when the weather increases the risk of fatal accidents."

This year's theme of "Score with Winter Alert - Sack Winter Hazards" reminds miners and mine operators of the risks, such as icy mine access roads and slippery walkways, among other hazards that occur due to the onset of colder weather. MSHA's Winter Alert campaign runs annually from October through March.

Coal mine explosions increase during the winter months when low barometric pressure, low humidity and seasonal drying cause methane to migrate more easily into the mine atmosphere. Other seasonal hazards include limited visibility, icy haul roads, and the freezing and thawing process on highwalls.

MSHA personnel will distribute to mine operators and miners Winter Alert posters, hardhat stickers, and decals displaying the agency's safety practices for working in underground and surface mines during wintertime.

#### Safety Checklist at Underground and Surface Mines:

- *Ensure proper ventilation*
- *Thoroughly examine highwalls*
  
- *Apply liberal amounts of rock dust*
- *Examine work areas for hazards*
  
- *Conduct frequent examinations*
- *Remove snow and ice from walkways*
  
- *Examine escapeways*
- *De-ice equipment*
  
- *Apply salt and sand where needed*

*(See next page)*



# Winter Alert 2008

“Score with Winter Alert - Sack Winter Hazards”



Score with  
**WINTER ALERT**  
**SACK WINTER HAZARDS**  
Through  
Mine Examinations  
Proper Ventilation  
Sufficient Rock Dusting  
Clear Escapeways and Evacuation Routes

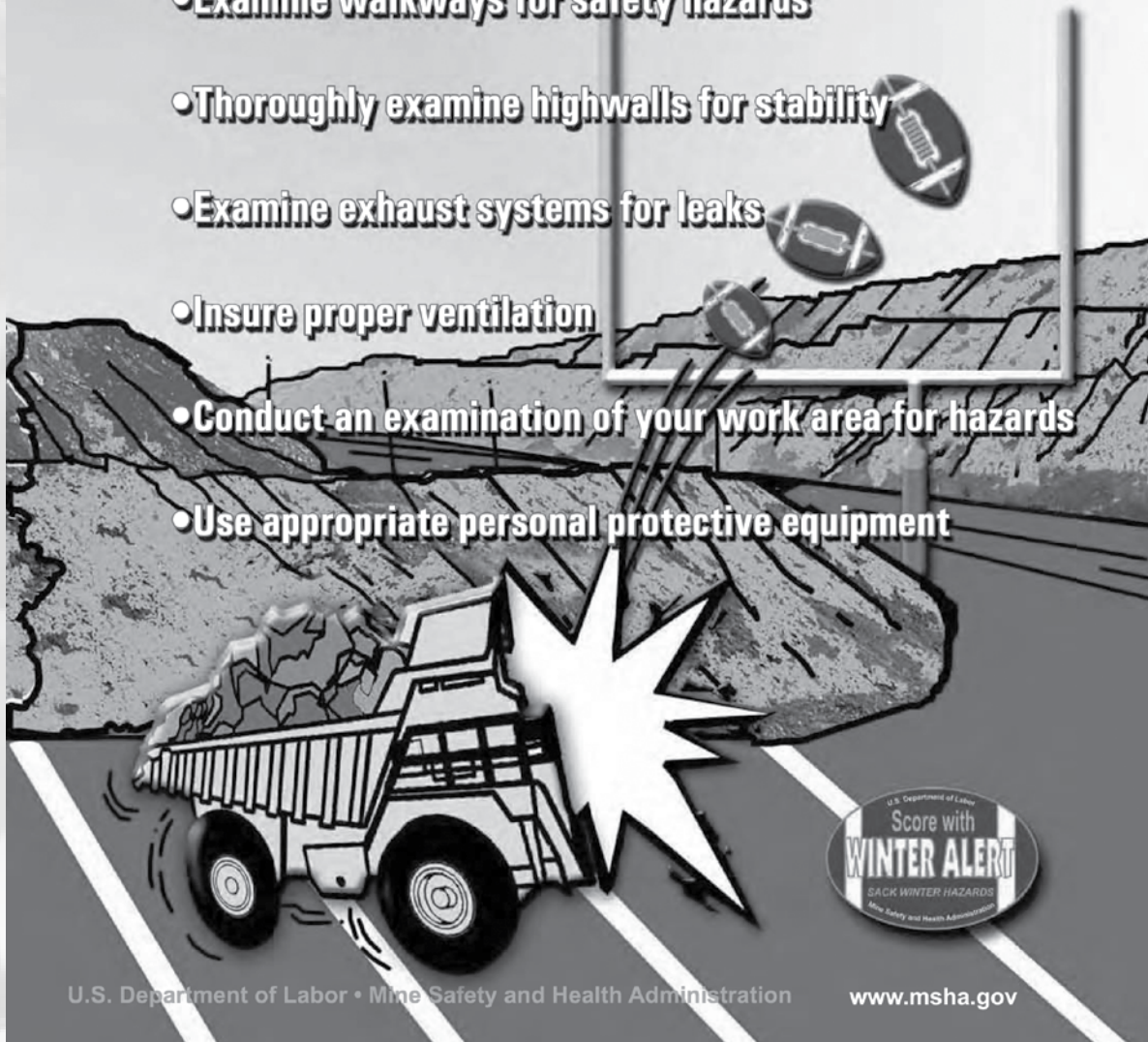
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U.S. Department of Labor  
Score with  
**WINTER ALERT**  
**SACK WINTER HAZARDS**  
Mine Safety and Health Administration

# Score with **WINTER ALERT** *SACK WINTER HAZARDS*

- Remove snow and ice in travelways
- Apply salt and sand where needed
- Examine walkways for safety hazards
- Thoroughly examine highwalls for stability
- Examine exhaust systems for leaks
- Insure proper ventilation
- Conduct an examination of your work area for hazards
- Use appropriate personal protective equipment





# A Farmer at Heart, Dunbar Now Lives for Mining

By RED Inc., Communications



If you're looking for William Dunbar, you had best start your search outside.

Don't expect to find him behind a desk pounding away on one of those new-fangled laptop computers. And don't expect to find him down at the health spa running on an indoor treadmill. That's just not William Edward Dunbar. Never was, never could be, and never will be.

Wide open spaces, clean air, and good honest work – that's all William Dunbar ever wanted in a job. At the Champlain Stone Quarry outside Warrensburg, New York, he found exactly those three things.

To feed his outdoor spirit, Dunbar spent his 20s and early 30s working as a farm hand – feeding cattle, fixing tractors, hauling hay, that sort of thing. But when his employer got out of the farming industry during the mid-1980s, Dunbar was forced to look for work elsewhere.

With the decline of the traditional family farm, farm jobs in those days were few and far between. Rather than become just another city slicker in pleated slacks, Dunbar hooked on with Champlain Stone and began his mining career like everyone else at the quarry – splitting stone with a hammer.

“Well, I used to farm it, so I like being outdoors all the time,” Dunbar said. “With my experience and running farm equipment and stuff, I just stepped right into it. Splitting stone was my first job, splitting it with a hammer.”

Dunbar has since moved on to bigger and better tools, trading his rock hammer for a Prentice rock mover and a pay loader. At no time during his 20 years at the quarry has Dunbar suffered a work-related injury, regardless of what tool he is using. When pressed, he is quick to redirect credit for his exemplary safety record.

“I attribute my safety success to a very good supervisor, a lot of professional training, and like I say, I've had experience with farm machinery,” he said. “So I had pretty much a general knowledge of how machinery and things work. That's what I attribute to my success – that and a lot of luck.”

As one of the original employees at Champlain Stone, Dunbar is the object of respect among the other miners. He takes his leadership role seriously – so seriously that he is not at all hesitant to shout down a miner who is creating hazardous situations on the job site.

Dunbar attributes his no-nonsense approach to safety to his years working on the farm. When the





“Eventually, I plan on retiring but I don’t plan on switching jobs,” he said. “I like my job. I like to see the changes with the weather. I guess its part of the farmer I grew up with. This is basically about as close as I can get to farming.”

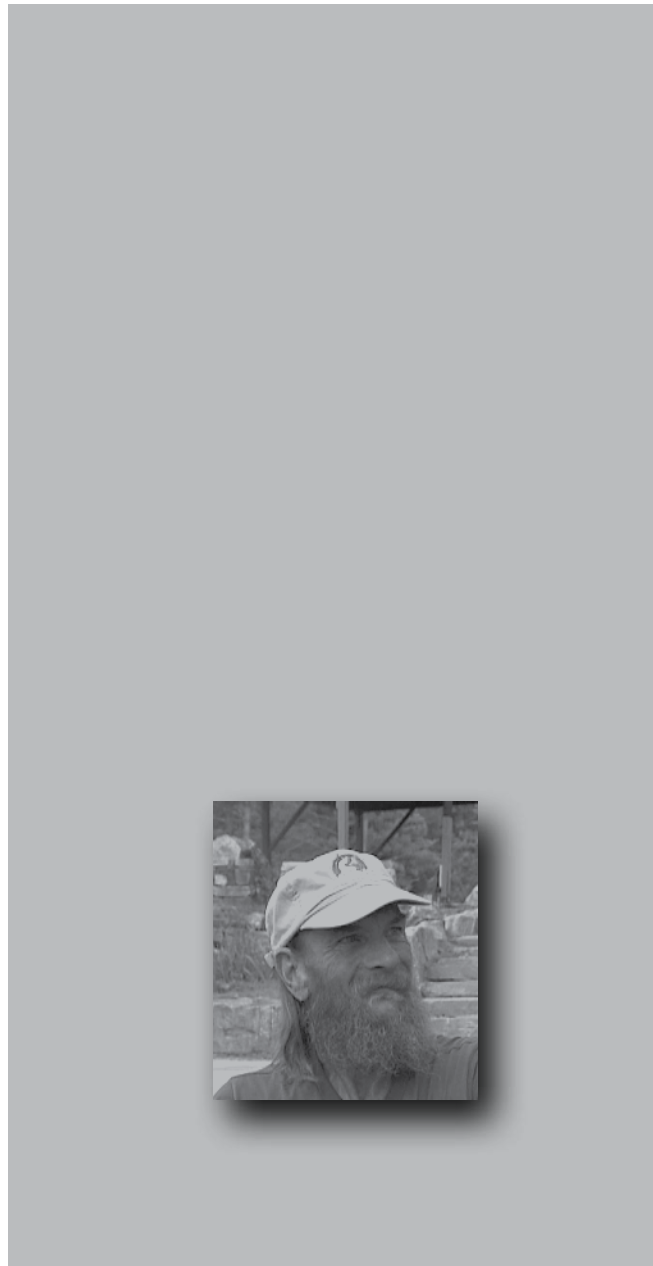
#### References

William Dunbar Interview, Unpublished Interview Transcript, Conducted by Mine Safety and Health Administration, 2007.

potential for serious injury or death exists, he isn’t afraid to shake things up in the name of safety. “If I see somebody doing something wrong, I’ll either stop or I’ll get right out and go over and kind of wake ‘em up a little bit and tell ‘em they shouldn’t be doing it that way or they shouldn’t be doing it at all,” Dunbar said. “I get my point across real strong at certain points. They say safety first, friends second around here. If they get mad, they have a lifetime to get over it.

Of all the jobs Dunbar has taken on at Champlain Stone, he calls his current position running the pay loader as the most hazardous. Between unstable rock conditions and unforeseen mechanical failure, riding that loader requires steely nerves and steady hands.

“You’re on uneven ground a lot of the time and you never know,” he said. “You might have a good sized rock in your bucket or a tire could blow out. Anything can happen.” So far, nothing has. And as long as Dunbar is free to work out in the clean mountain air, he doesn’t expect anything will. Now in his mid-50s, he can begin to see a day when he might hang up the keys to his loader. Until that day, however, it is business as usual for the miner with the heart of a farmer.





# Centralia: The Great Pennsylvania Coal Seam Fire

By RED Inc., Communications



*The anthracite coal pictured here burns hotter than any other coal type and is the fuel for the underground fire that forced the evacuation of Centralia, Pennsylvania.*

Anthracite coal ignites at 752 degrees Fahrenheit. And once it gets going, anthracite coal just burns and burns and burns.

Just ask the folks living in and around the coal mining town of Centralia, Pennsylvania. A bungled clean-up effort at the town landfill ignited a coal seam in May 1962, and an underground coal fire has burned unchecked ever since – turning the once robust mining community into a modern-day ghost town.

## ***Fire in the Hole***

The abandoned strip mine pit near Centralia's Odd Fellows Cemetery seemed like a logical place to build a dump site. The mine was considered dead, and the town needed an out-of-the-way spot to ditch its waste.

In order to minimize the scope of the dump site, amateur firefighters would set fire to the landfill just prior to Memorial Day and let it burn for several weeks. The firefighters then generally returned to the pit and extinguished the smolder-



ing trash. In 1962, however, the firefighters chose to wait and let the fire burn out and die. More than four decades later, they are still waiting.

As the 1962 burn crept into the lower depths of the landfill, it apparently ignited an anthracite coal seam from the old mine. That fire smoldered its way underground and is still burning today, causing state highway cave-ins, random sinkhole formations, and the mass evacuation of Centralia.

Part of the problem with the Centralia mine fire was the quality of the coal involved. With a carbon content of at least 92 percent, anthracite coal is shiny and more rock-like than most coal. The carbon density makes an anthracite fire very difficult to ignite and similarly difficult to extinguish.

Once the Centralia fire got going, it quickly became nearly impossible to snuff. Many attempts were made to douse and smother the fire, but the smoldering anthracite continued its slow burn beneath the town.

Beginning in the late 1970s, residents slowly became aware of the genuine hazard posed by the underground fire. In 1981, Centralia gained national attention when a 12-year-old resident, Todd Domboski, fell partway into a 150-foot-deep sinkhole caused by the fire. Domboski was rescued by his cousin, but nothing could rescue the town from a newfound fear spreading from neighborhood to neighborhood.

Todd Domboski's incident not only spooked the residents of Centralia, it also spooked officials in the Centralia Borough Council, the county of Columbia, the State of Pennsylvania, and the United States Government. The very thought of a child plunging to his death due to a lack of government intervention was unthinkable. When Domboski dropped into that steaming, muddy sinkhole in 1981, his fall also signaled the inevitable fall of Centralia.



*Steam rises from a split in the asphalt along the stretch of Pennsylvania State Highway 61 South of Centralia.*

### ***Burn, Baby, Burn***

All efforts to save the town of Centralia had failed. In 1984, those efforts switched to saving the people.

The United States Congress made \$42 million available for relocation and the majority of Centralia's residents sold their property to the government and moved away. Eight years later, the State of Pennsylvania claimed eminent domain and condemned all buildings in Centralia, whether commercial or private. Most of the homes and businesses in town were demolished following Pennsylvania's eminent domain declaration, and native grasses now grow where the old filling station sat.

The fire seam crosses directly beneath the old Pennsylvania Route 61 south of town, causing huge splits in the asphalt and vent clouds of toxic carbon monoxide gas. Crew after crew battled with the roadway for decades before closing it for good in 1994 due to pavement buckling.

Steam vents more commonly found in places such as Yellowstone National Park or Hawaii's Mount

*(See next page)*

Kilauea now cover hillsides and forested areas in and around Centralia. Some entrepreneurs wanted to capitalize on the fire-and-brimstone feel of Centralia and change the borough into “Hell-town,” USA, complete with tours led by guides dressed up as trident-toting demons.

A sign at the edge of town warns tourists of Centralia’s true hell, reading: “Warning – Danger. Underground Mine Fire. Walking or driving in this area could result in serious injury or death. Dangerous gases are present. Ground is prone to sudden collapse.” Another reads: “Public Alert: Area subject to mine subsidence and toxic gas emissions.”

The anthracite seam courses eight miles through Columbia County and its value, according to residents, is in the billions. The current fire is estimated to cover an area of approximately 400 acres or three-fifths of a square mile. It is estimated the Centralia fire has enough fuel to burn for at least 250 more years along the eight-mile anthracite vein, and no plans are in place to extinguish the fire.

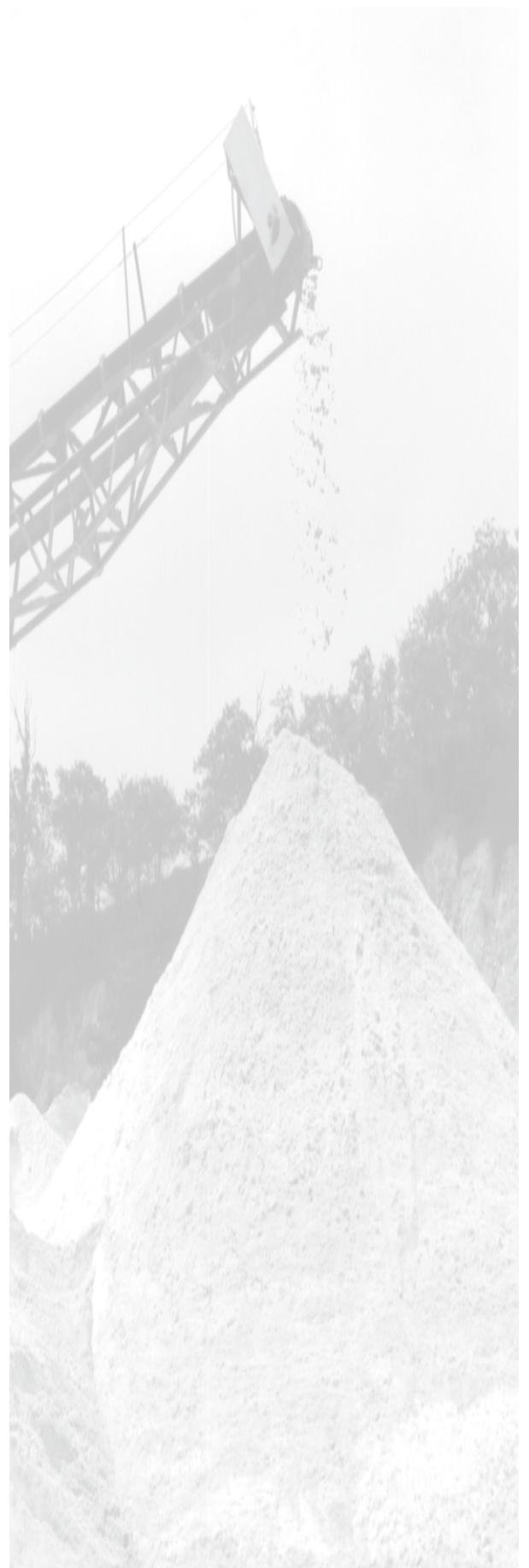
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# MSHA's Occupational Illness and Injury Prevention Program Health Idea

## “Wear Your Protective Clothing, and Keep it Clean!”

In addition to the use of engineering and administrative controls to reduce exposures to permissible levels, personal protective equipment (PPE) is used to supplement these measures. In fact, for a few occupations PPE may be your only means of protection. The following tips are for the use of health-related PPE in the mining industry.

- **Carefully choose your PPE appropriate to the situation. Contact your Health & Safety Coordinator or Industrial Hygienist for assistance.**
- **Select your gloves to protect against the chemical or physical hazards that are present.**
- **Clean and maintain your protective clothing per the manufacturer's instructions.**
- **Always inspect your PPE before each use. Alert your supervisor and replace your PPE if you find a crack, puncture, tear, leak, or any unusual condition.**
- **If an allergic reaction occurs (reddened skin, rash, hives, etc.), alert your supervisor.**



# Thank You for your support!!

## South Central District

Heidi Sexton - New Mexico  
Texas State Holmes Council - Texas  
Luis Marin - Lordsburg, New Mexico  
North Central Holmes Council - Texas  
Indiana Holmes Safety Council - Indiana  
Court van Sickler - New Braunfels, Texas  
Scott Meador - Shermco Industries - Texas  
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Joint Mine Safety & Health Conference Committee - Texas  
New Mexico Safety Conference Committee - New Mexico  
Florida Mine Health & Safety Conference committee - Florida  
Doug Williams - Pinnacle Mining Company - Daniels, West Virginia  
Minnesota Mine Safety Association - North Mankato, Minnesota  
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Danny & Cindy Marschall - Marschall Fire & Safety - Venus, Texas  
Joseph A. Main - International Mine Safety Consultant - Spotsylvania, VA

Kanoma Holmes Safety Council - Independence, KS -- in memory of Mike Rickner, former safety manager of Monarch Cement in Humboldt, KS

A very special Thank You goes out to all of you. We could not have accomplished such a successful year without your contributions.

Thank You,  
Joseph A. Holmes Scholarship Committee



*Court van Sickler - New Braunfels, Texas*



*Heidi Sexton - Mexico*



*Ralph Rodriguez and staff,  
MSHA San Antonio Field Office - Texas*



*Contribution by Danny & Cindy Marschall,  
Marschall Fire & Safety - Venus, Texas*

## We Salute You Contributors



*Dave Puzan, Plant Manager  
Buzzi Unicem USA- Pryor, OK*



*Wayne & Mike T.*



*Sani Grant, John Henderson and  
Larry Hommond*



*John Henderson and A.C. Rodriguez*



## Marble Man – Mike Blair Turns Stone Into Art

By RED Inc., Communications

Spend a minute with Mike Blair on the job site, and you know he is having fun. And why not? Every day he takes huge chunks of raw stone and turns them into works of art.

Blair is not a traditional sculptor and has never carved nude statues from marble blocks. He is an industrial artist at Champlain Stone Quarry in Warrensburg, New York. You may never find his work on display at the Metropolitan Museum of Art in New York City or the Louvre Museum of Art in Paris.

Nonetheless, you will find a proud industrial artist behind Blair's smiling eyes. Somewhere beneath the time-scarred hard hat beats the heart of a true Michelangelo. Standing in front of a chiseled white marble slab, Blair throws his shoulders back and proudly explains how he changed a ton of unrefined rock into an expensive bar top.

"It's just a piece of marble for a customer in Manhattan, and I'm sure they will have a lot of conversations over this bar top about how it was

made," Blair said. "We try to show everybody that works here what our finished product is and what its use is. Pride is probably the biggest thing. Pride and really cool power tools."

Blair's art studio is filled with every kind of industrial tool imaginable. When describing how these tools helped get the sculpted bar top out of the mountainside and into his industrial art studio, Blair looks like a five-year-old talking about his brand new bike. He opens his arms wide and smiles when explaining the process of taking the marble from the quarry pit to the sculpting table to the shipping dock.

"This piece of stone was quarried in a 25-ton block form first using a diamond chain saw, cut out with a diamond wire saw, and the block was then brought up here where it was cut with a gang saw," Blair said. "Then you have to make a program on a computer in an AutoCAD system, and it is cut by a diamond router head. A lot of work went into this and that's what makes marble a little bit costly."



### "Ordinary Miner"

Watching him work, it is immediately apparent that Blair is no ordinary miner. Yet the 28-year industry veteran is quick to point out that there is really no such thing as an "ordinary" miner in the modern age. Industry specialization has changed the way miners work, helping miners abandon the notion of a boring 9-to-5 workday.

Invention, innovation, and intuition are constantly working together to improve all aspects of the



mining industry. “As a result,” says Blair, “today’s miners tend to work with better efficiency and better skill to produce better products. Most importantly, today’s miner heads home with both a paycheck and a sense of accomplishment.”

“I think in professional mining today you almost have to take a little bit more pride in what you do,” Blair said. “It’s not all drilling and blasting. It’s getting a little bit more involved in the technology changes and the different types of technology that’s offered to you and trying to implement that. Then you get a more sound and realistic feel for just how mining really is.”

Watching as his polished marble bar top is packaged and loaded for the trip to Manhattan, Blair is unable to hold back his infectious smile. What was once a shapeless mass of uncut marble is soon to become the pride and joy of a New York barkeep.

Perhaps someday he will see his finely crafted work of industrial art again, but probably not. Like a parent sending an 18-year-old into the world, Blair has mixed emotions when it comes to saying goodbye. He is proud of what he has created, but some part of him is sorry to see it go.

“I’ve done some of my best work on one of these (bar tops), but on the other side,” Blair says with a laugh, “Everybody wants the glorious job. People thrive on limelight. But really, we try to show everybody that works here what our finished product is. We did this, we helped build this, on and on and on.”

“Pride is probably the biggest thing. Have fun. Go at it.”

## References

Mike Blair Interview, Unpublished Interview Transcript, Conducted by Mine Safety and Health Administration, 2007.





**CDC**  
Workplace  
Safety and Health

# Technology News

No. 531
Milestones in Mining Safety and Health Technology
September 2008

## Engineering Controls for Reducing Continuous Mining Machine Noise

### Objective

To develop effective noise controls for continuous mining machines (CMMs) to reduce worker noise exposure.

### Background

Noise-induced hearing loss (NIHL) is an occupational illness caused by chronic exposure to excessive sound levels. For underground coal mine workers, NIHL continues to be a serious health issue. Analysis of hearing loss data suggests that by retirement age, 70%–90% of U.S. coal mine workers will have a hearing impairment. Operated in the confined spaces of underground mines, large industrial mining equipment often produces sound levels that can be harmful to workers. Of all equipment used in underground coal mining operations, CMMs account for the most noise overexposures. To reduce the occurrence of noise overexposures, engineering noise controls must be developed for the CMM.

### Approach

Engineering noise controls address noise at the source to reduce sound levels and prevent NIHL. Noise generated by CMMs mainly results from three operational component systems: dust collection, cutting, and conveying. Of these three systems, the onboard conveyor system was found, through field and laboratory studies, to be the dominant noise source. Since sound levels produced by the conveyor system are higher than those of other component operations, noise controls targeting the conveyor system must be considered first for effective reduction of operator noise exposure. CMM conveyor noise is caused by impacts that occur between the conveyor deck and flight bars, which are used to move mined material to the discharge end of the machine. Research conducted by the National Institute for Occupational Safety and Health (NIOSH), with stakeholder involvement, has focused on producing noise treatments to reduce noise generated by the CMM conveyor system.

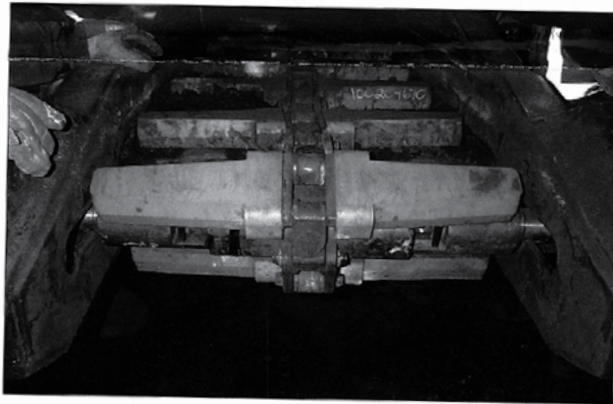


Figure 1.—Urethane-coated flight bar chain.

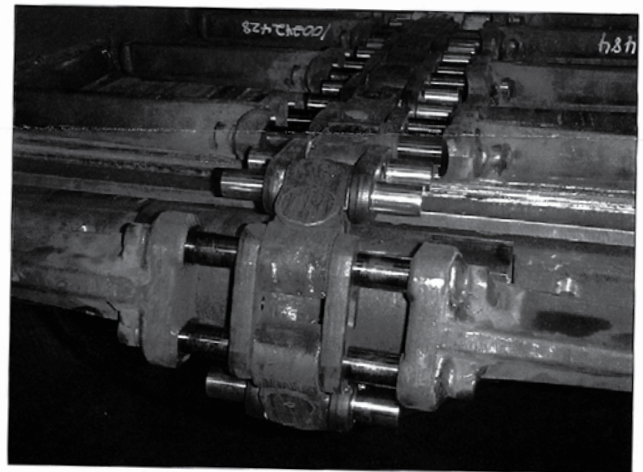


Figure 2.—Dual-sprocket driven chain.



**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
Centers for Disease Control and Prevention  
National Institute for Occupational Safety and Health

Two engineering noise controls have been developed to reduce CMM conveyor noise: the urethane-coated flight bar chain and the dual-sprocket chain. The urethane coating (Figure 1) used to treat the conveyor flight bars works by cushioning the impact blows of the bar on other parts of the conveyor. The dual-sprocket chain (Figure 2) reduces noise by maintaining a constant level of tension and by decreasing chain slack that otherwise produces high-intensity, noise-generating flight bar impacts at the conveyor transition points.

## Results

Engineering noise controls for CMMs have been shown to reduce noise produced by the conveyor system. Laboratory sound power level measurements were conducted in the National Voluntary Laboratory Accreditation Program-accredited reverberation chamber at the NIOSH Pittsburgh Research Laboratory. These tests were performed to assess the acoustic performance of engineering noise controls in a controlled environment. A CMM with a urethane-coated flight bar chain installed reduced conveyor system noise by 7 dB(A), while a conveyor chain driven with the dual-sprocket system demonstrated a reduction of 3 dB(A).

To fully evaluate these noise controls, underground testing needed to be performed. The urethane-coated flight bar chain and dual-sprocket flight bar chain were installed on different machines at different underground coal mines. The urethane-coated flight bar chain demonstrated an 8-hour time-weighted average exposure reduction of 3 dB(A). The urethane coating also extended chain life by preventing any chain link failures during the 6-month test period. (A failure rate of three failed links in 4 months is typical for standard chains in similar mine conditions). The dual-sprocket chain showed promise for reducing operator exposure close to the Mine Safety and Health Administration (MSHA)

permissible exposure level (PEL) and for achieving compliance with Title 30 of the Code of Federal Regulations (CFR).

## Recommendations

Targeting noise at the source through engineering noise controls reduces operator overexposure to noise. Title 30 of the CFR requires any mining machine operator who is above the PEL to use all feasible engineering and administrative noise controls. Both the urethane-coated flight bar chain and the dual-sprocket chain are considered by MSHA to be "technologically and administratively achievable." These engineering controls should be considered mandatory when CMM operators are overexposed to noise.

## For More Information

Publications on hearing loss prevention in the mining industry can be downloaded from the NIOSH Mining Web site at: <http://www.cdc.gov/niosh/mining/pubs/programareapubs14.htm>

For more information about the urethane-coated flight bar chain or the dual-sprocket chain for reducing noise exposure, contact Adam K. Smith, NIOSH Pittsburgh Research Laboratory, P.O. Box 18070, Pittsburgh PA 15236-0070; phone: (412) 386-6028; e-mail: [ASmith9@cdc.gov](mailto:ASmith9@cdc.gov).

To receive NIOSH documents or for more information about occupational safety and health topics, contact: **1-800-CDC-INFO** (1-800-232-4636), **1-888-232-6348** (TTY), e-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov), or visit the NIOSH Web site at <http://www.cdc.gov/niosh>

Mention of any company name or product does not constitute endorsement by the National Institute for Occupational Safety and Health.



# MSHA's Occupational Illness and Injury- Prevention Program Health Tips "Cold Stress"

Extended exposure to windy, cold weather can lead to hypothermia and death.

Hypothermia occurs when body temperature falls to a level where normal muscular and brain functions are impaired. There are three stages of hypothermia.

- **Impending hypothermia**
- **Mild hypothermia**
- **Severe hypothermia**

Impending hypothermia occurs when the body's core temperature drops to 95°F (35°C). The skin may become pale, numb and waxy. Muscles become tense. Fatigue and weakness begin to show.

The treatment for impending hypothermia includes removal from the cold, wet environment, providing external heat (fire, blankets) and providing hot drink (no alcohol, tea or coffee).

Mild hypothermia occurs when the body's core temperature drops to 93.2°F (34°C). Uncontrolled shivering begins. The individual is still alert, but movement becomes less coordinated and some pain and discomfort exists.

The treatment for mild hypothermia includes removal from the cold environment, keeping the head and neck covered to prevent further heat loss and providing warm, sweetened drink (no alcohol, tea or coffee) and high-energy food.

Severe hypothermia occurs when the body core temperature drops below 87.8°F (31°C). The skin becomes cold and may be bluish in color. The individual is weak and uncoordinated. Speech is slurred and the victim appears exhausted, denies problem, and may resist help. Gradually there is a loss of consciousness with little or no breathing occurring. The individual may be rigid and appear dead.

The treatment for severe hypothermia includes immediate external warming. One method may be by placing the victim in a warmed sleeping bag with two other people. Keep the victim awake and apply mild heat to stop loss of heat, not to re-warm.

Check for pulse and breathing. If neither is present, begin CPR and mouth to mouth resuscitation. Continue until medical help arrives.

Never give up on a victim. Even though cold, stiff, and bluish with fixed pupils and no heart tones or signs of breathing, victims have been resuscitated and have recovered fully.

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Tag # AP2002-H004



# **Joseph A. Holmes Scholarship Deadline**

**The 2009 scholarship application is now posted on the Holmes webpage at [www.holmessafety.org](http://www.holmessafety.org). Applicants interested in applying for the J.A. Holmes scholarship should submit an application by January 31, 2009.**

**If you are a mine operation currently using students as interns, please help us distribute this vital information by making your interns aware of the J.A. Holmes scholarship program.**



## Minimizing Respirable Dust Exposure in Enclosed Cabs by Maintaining Cab Integrity

### Objective

To minimize the equipment operator's respirable dust exposure in enclosed cabs of mobile equipment by installing cab filtration and pressurization systems and by keeping doors and windows closed.

### Background

Enclosed cabs are used on mobile equipment to protect operators from health and safety hazards. The primary health concern is overexposure to respirable dust. Examples of such equipment in mining include drills, dozers, haul trucks, and other equipment. When equipment is new, the operator's dust exposure is normally at acceptable levels. As the equipment ages and gaskets and seals deteriorate, the air quality inside an enclosed cab can reach a point where it is no longer at acceptable levels for the equipment operators.

In an effort to improve the air quality in enclosed cabs of older mining equipment, NIOSH has been performing research to retrofit cabs with new filtration and pressurization systems. Over the past few years, this research has shown that retrofit systems can substantially improve the cab's air quality back to safe and acceptable levels. However, this is only possible when a positive cab pressure is achieved and maintained. Thus, when a cab door or window is opened, the cab pressure drops to zero and the cab filtration and pressurization system is rendered ineffective. During a recent field study, the magnitude of this impact was noted when a drill operator repeatedly opened the cab door throughout the course of the drill cycle. Upon closer examination, it was determined that the cab door was being opened to manually guide the next drill steel into place each time an additional section of steel was needed to drill deeper holes.

### Approach

A recent test was performed to evaluate a new uni-directional flow cab filtration and pressurization system installed on an enclosed cab of a surface drill at a stone operation. During this test, instantaneous respirable dust monitors were placed inside the enclosed cab to evaluate the effectiveness of this new system. These monitors recorded the average respirable dust concentration every 30 sec on the instrument's internal datalogger. While performing this testing, it was noted that the drill operator repeatedly opened the cab door to manually guide a new drill steel into place each time an additional section was needed. During this evaluation, the operator was drilling holes to a depth that required the use of five steels. When the drill steel was advanced the entire length, the operator went through a series of tasks to remove the drill steel from the powered drive head, obtain another drill steel and swing it into place. At this point in the process, the drill operator opened the cab door, leaned out, and with

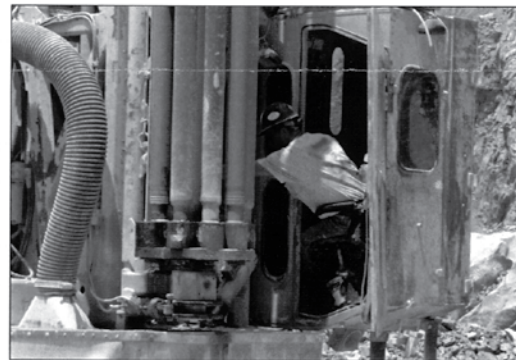


Figure 1.—Drill operator reaching out of cab door to guide new drill steel into place.



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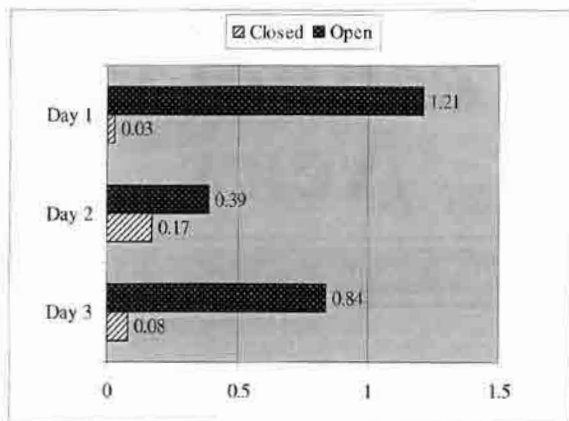


Figure 2.—Average respirable dust concentration ( $\text{mg}/\text{m}^3$ ) inside drill cab during periods with the cab door closed and open for 3 days of testing.

his left arm manually guided the drill steel into the previous steel (Figure 1). When the new steel was completely threaded down tight into the previous steel, the drill operator closed the cab door and began drilling again. The total time to add a new drill steel was roughly 3 min. At approximately 2 min into the process, the drill operator would open the cab door to guide the next drill steel into place. The cab door was normally open somewhere between 30 and 45 sec each time this process took place before being closed again. Since no drilling was occurring and no dust cloud was visible as the cab door was opened, the impact to the drill operator's respirable dust exposure was initially thought to be insignificant.

## Results

When the instantaneous respirable dust data from inside the enclosed cab were analyzed, a substantial increase in respirable dust concentrations was noted during the periods when the door was open. This increase was especially significant when one considers that drilling had ceased approximately 2 min before the door was opened. Figure 2 shows average concentrations for 3 days of testing for time periods when the cab door was closed and opened. The average concentration was  $0.09 \text{ mg}/\text{m}^3$  with the cab door closed and  $0.81 \text{ mg}/\text{m}^3$  with the door open. Despite no visible dust cloud during the time when the cab door was open, respirable dust concentrations inside the cab were nine times higher than when the door was closed. Additionally, once dust enters and coats the inside of the enclosed cab, it exposes the drill operator every time it is disturbed and becomes airborne, even with the cab door closed.

The results of this testing indicate the significant impact of an open door or window on dust concentrations inside an enclosed cab. In operations where the cab door or window may be opened for longer time periods, especially in operations with higher outside dust concentrations or higher silica contents, the practice could have an even greater impact on the operator's dust exposure.

## Recommendations

Cab filtration and pressurization systems should be installed on enclosed cabs of all mining equipment to improve the air quality to the operator. In addition, every attempt should be made to keep cab doors and windows closed at all times in an effort to keep the cab pressurized and working properly. The only exception to opening a door should be when the equipment operator enters or exits the enclosed cab. For mining operations using drills that require the operator to manually guide drill steels into place, the drill manufacturer should be contacted to purchase systems that have been developed to provide for drill steel stabilization, eliminating the need for this task to be performed by the drill operator.

## For More Information

For more information about reducing dust exposure in enclosed cabs, contact Andrew B. Cecala (412-386-6677, [ACecala@cdc.gov](mailto:ACecala@cdc.gov)) or John A. Organiscak (412-386-6675, [JOrganiscak@cdc.gov](mailto:JOrganiscak@cdc.gov)), NIOSH Pittsburgh Research Laboratory, P.O. Box 18070, Pittsburgh, PA 15236-0070.

Publications on dust control in the mining industry, including cab filtration and pressurization systems, can be downloaded from the NIOSH Mining Web site at <http://www.cdc.gov/niosh/mining/pubs/programareapubs9.htm>.

To receive NIOSH documents or for more information about occupational safety and health topics, contact: **1-800-CDC-INFO** (1-800-232-4636), **1-888-232-6348** (TTY), e-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov), or visit the NIOSH Web site at <http://www.cdc.gov/niosh>

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# Monongah Mine Disaster

By RED Inc., Communications

Americans celebrate Father's Day annually on the third Sunday in June. First recommended as a national holiday by President Calvin Coolidge in 1924, Father's Day finally became an official U.S. holiday in 1972.

Today, Father's Day gives American families a chance to gather and celebrate with gifts, good food, and memories of childhood. It is a day filled with family joy and happiness.

The original observance of Father's Day, however, had a very different feel. The original Father's Day was a memorial gathering for the fathers and sons who died in America's worst-ever mining tragedy.

On December 6, 1907, at 10:28 a.m., a coal mine explosion claimed the lives of 362 miners in Monongah, West Virginia. Though the death toll exceeded anything seen before or since in American mining history, the human toll on the mining town of Monongah was much, much higher.

No one knows exactly how many miners died in the Monongah mines that Friday morning. Official numbers put the death toll at 362. However, because of the common practice of miners bringing their teenage sons to the mine

and the extensive damage caused by the blast, a precise body count was impossible.

The men who died in Fairmont Coal Company's No. 6 and No. 8 mines that day left approximately 250 wives without husbands and 1,000 children without fathers.

For weeks after the disaster, the sounds of misery echoed through the streets of Monongah as charred, lifeless bodies were extracted from the wrecked mine. Winter was gripping the northern West Virginia town, and nearly 1,300 dependents of those dead miners were left without heat, food, or hope.

Seven months later, a local Methodist minister, R. Thomas Webb, held the first Father's Day service on July 5, 1908.

## My Three Sons

As the father of three boys, Webb had an intimate understanding of the special relationship between father and son. Three years after graduating from the esteemed Vanderbilt Seminary in 1902, he became the pastor at Williams Memorial Methodist Church South in Fairfield, just four miles from Monongah.

Webb's experience as a father, however, was stained with tragedy. His first son, Robert Jr., died in infancy. Next on the Webb family tree came twins, Vernon and Ruffner. Ruffner also died as an infant, and smallpox later claimed Vernon in his teenage years. Perhaps these personal experiences with



*The Monongah Heroine Statue*



*Miners pose outside the mine entrance in Monongah.*

family loss led Webb to ensure the Monongah dead were never forgotten.

When the hundreds of fatherless children and widowed wives were left behind by the Monongah Mine disaster, Pastor Webb was front and center in the efforts to restore hope to the aching town of Monongah. Throughout the long winter of 1908, Webb organized charity efforts throughout the state to support the families of the Monongah Mine victims.

On the recommendation of one of his parishioners, Webb scheduled a Father's Day service at Williams Memorial Methodist Church South, celebrating the lives and sacrifices of the 362 dead.

On August 10, 1972, Ward Downs, a witness to that first Father's Day observance in Fairfield, sent a letter to West Virginia State Congressman Arch Moore. In 1972, Congress was preparing to select a date on which to officially nationalize the Father's Day holiday.

"It has recently come to my attention of a movement establishing a Father's Day by an act of Congress to be observed the same as Mother's Day," Ward said in his letter. "It was my privilege to have attended the first Father's Day service on July 5, 1908. ... I recall the occasion very distinctly as the pulpit was decorated by having ripened sheaves of wheat placed about it. ... Any assistance you can give this movement will be very much appreciated by me and all the Methodists in this part of the country."

*(See next page)*



On December 6, 2007, exactly 100 years after the disaster, town officials dedicated the “Monongah Heroine Statue” next to the Monongah Town Hall. “It not only affected the town of Monongah, but the whole mining industry as a whole,” said Marianne Mora, Director of the Convention and Visitors Bureau of Marion County. “It’s certainly not a celebration. It’s a very solemn occasion ... a remembrance.”

### *Dust to Dust*

Like most coal mine accidents of the day, the Monongah Mine disaster was blamed on a volatile mixture of methane gas and coal dust. The fan at the No. 8 mine forced 240,000 cubic feet of air into the mine each minute and the No. 6 mine had a fan with a 200,000 cubic-foot capacity.

Two months earlier, the West Virginia State Mining Office inspected the mine and found no dust or gas in No. 8 and only a trace of gas and dust in No. 6. The mines were renowned throughout the state for their safety and modern equipment. Still, while the exact cause of the blast will never be known, it is thought that a pocket of methane gas was ignited at about 10:20 a.m. that December morning, igniting coal dust and setting off a chain reaction throughout the two mines.

Nearly three years later, Bureau of Mines Chief Engineer George S. Rice conducted a series of experiments to determine the most plausible cause of the numerous mine disasters of the day. Rice concluded it was coal dust, not fire damp or methane, which was to blame.

A misunderstanding of coal dust reaction was only the beginning of the troubles at Monongah. With no available breathing equipment, would-be rescuers could only go into the mine as far as they could hold their breath. Despite the bravery of the rescue teams, choking gases in the afterdamp prevented deep-mine rescue.

One miner, Peter Urban, crawled into a small hole in the mine shaft and escaped the toxic afterdamp. Urban eventually escaped the mine, but died in a mine collapse 19 years later.

The explosions were felt up to eight miles away, knocking people and horses to the ground and bouncing street cars off their rails. The Fairmont Coal Company No. 6 and No. 8 mines were completely wrecked, causing company officials to choose mine closure over a costly rebuilding process. The mines’ mouths were subsequently bricked over, closing the door forever on the worst mine disaster in U.S. history.

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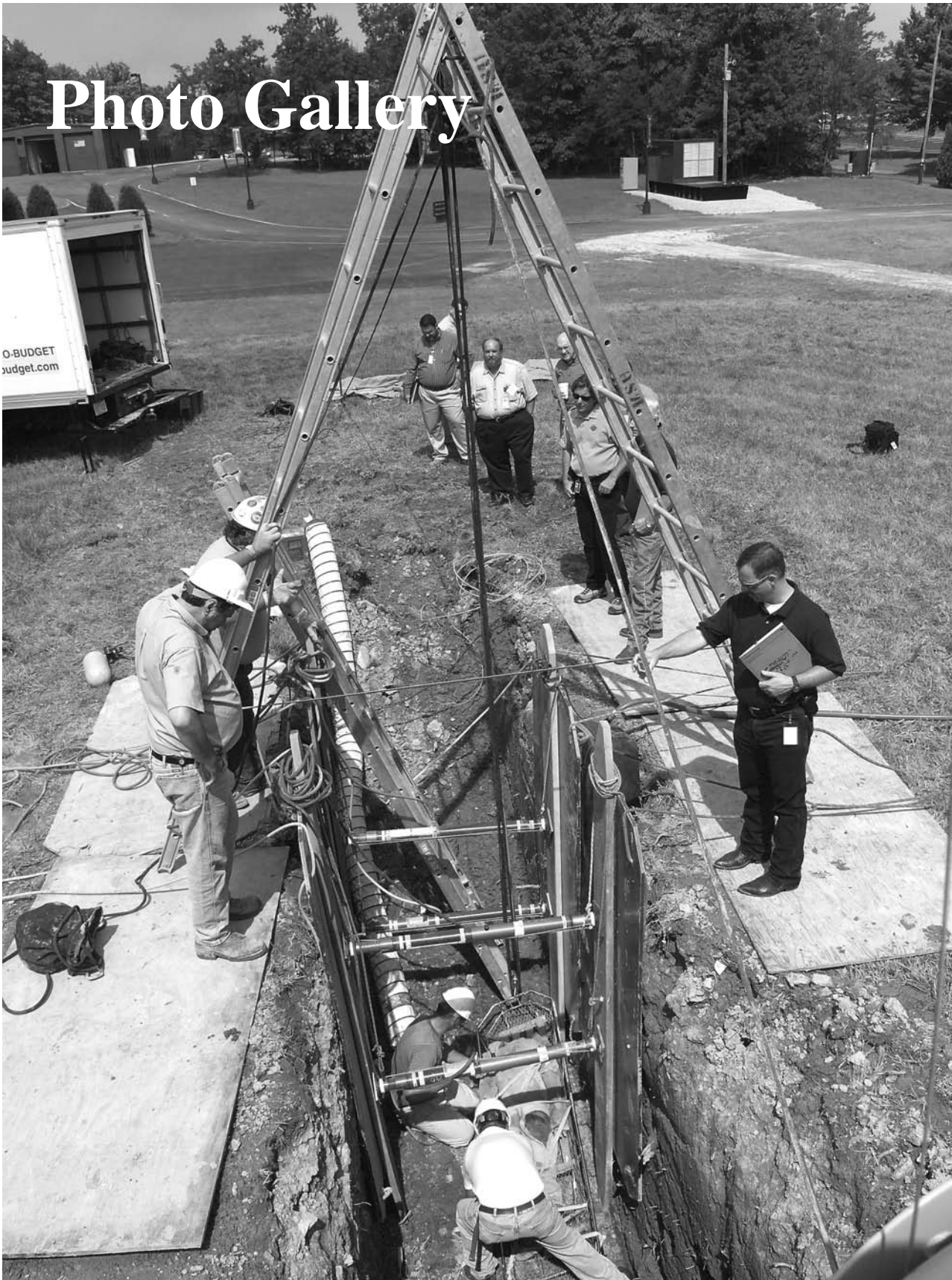
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# Photo Gallery



*Rescue demonstration at the 2007 Construction Seminar, National Mine Health and Safety Academy, Beckley, West Virginia*

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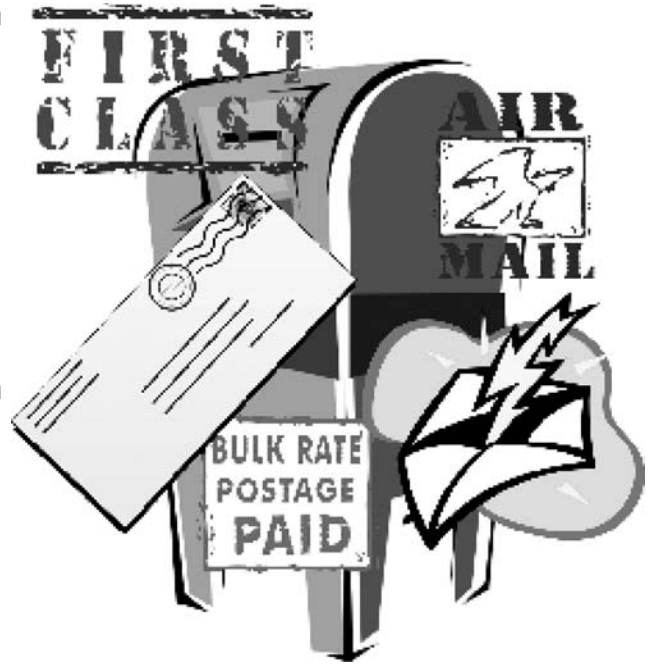
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