

NIOSH

LAKE LYNN LABORATORY

*One of the world's foremost mining
laboratories for conducting large-scale
safety and health research*



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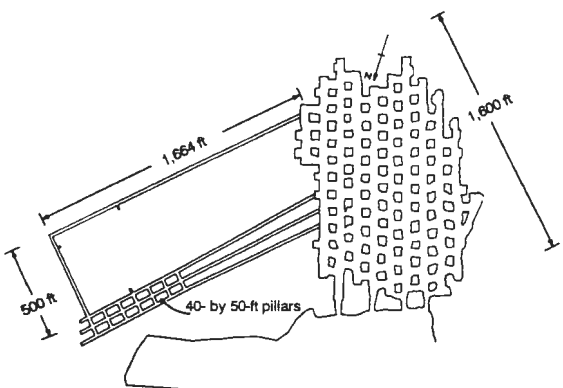
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational
Safety and Health

August 1999

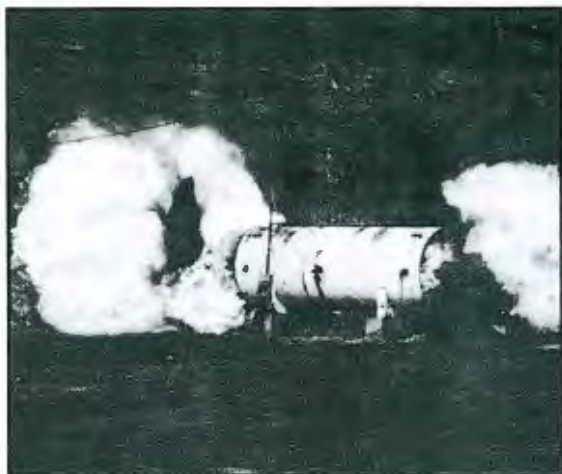
LAKE LYNN LABORATORY IS A UNIQUE mining research laboratory designed to provide a modern, full-scale environment for the evaluation of mine safety and health technology. Formerly operated by the U.S. Bureau of Mines (USBM), the facility is now under the direction of the National Institute for Occupational Safety and Health (NIOSH). Lake Lynn occupies more than 400 acres at a former limestone mine in the Greenbriar Formation. It is located approximately 50 miles southeast of Pittsburgh, near Fairchance, PA, and specializes in the study of large-scale surface and underground fires and explosions.

Methane gas and coal dust explosions had been a constant threat to the U.S. mining industry in the early 1900s. Thus, in 1910, the U.S. Congress created the USBM to study these explosions and to develop methods of eliminating or controlling this grave problem. Since that time, changes in mining geometries dictated the need for new facilities, which led to the development of Lake Lynn Laboratory in the early 1980s.

The principal purpose for constructing the laboratory was mine explosion testing. However, the underground Experimental Mine design, expansive surface areas, and state-of-the-art data-gathering and computer systems afford an opportunity for a broad range of mine safety and health research.



Lake Lynn underground workings



Cannon gallery coal dust explosion

Both underground and surface test sites are designed for mine fire research, explosives research, and large-scale explosion testing of gases, dusts, and chemicals.

Underground entries at the Lake Lynn Experimental Mine consist of approximately 25,000 ft of workings developed in the mid-1960s and 7,500 ft of entries developed in 1980-81.

The layout of modern underground coal mines, as well as geometries encountered in noncoal mines such as oil shale and limestone, can be simulated by various configurations of the Lake Lynn Experimental Mine.

A critical component of Lake Lynn Laboratory is the unique high-speed data-gathering instrumentation system. Information is relayed from the mine to the main control building by underground instrument stands and data-gathering panels. This state-of-the-art computer system can accept input from underground instruments, process the information, and provide output in tabular or graphic form.

To facilitate research and underground maintenance of the laboratory, electrical power, compressed air, water, communication, video lines, and natural gas systems have been incorporated into the design at the site.

The mine ventilation system features a total of 240 tons of refrigeration capacity to remove water from the incoming air. Flexibility is augmented by movable bulkhead doors, which further increase the ability to regulate ventilation patterns.

Because of the versatile environment of Lake Lynn Laboratory, a diversity of mining research can be performed here. Some specific areas of research conducted in the Lake Lynn Experimental Mine include the development and/or evaluation of—

- Underground fire extinguishment devices
- Methane gas and coal dust explosions and suppression techniques
- Performance of underground stoppings and seals
- Potential health hazards of materials, particularly explosives and diesel engines
- Mine roof support technologies, including roof bolts, cable bolts, trusses, and resin and other anchorage products



Mine roof support testing

- Realistic training and instruction in mine-related problems
- Mine rescue
- New or improved underground safety equipment
- Prototype underground mining equipment
- Respirable dust dispersion

Surface facilities at Lake Lynn Laboratory include a—

- ***Fire suppression facility*** for conducting full-scale investigations of fire suppression systems under ventilated conditions
- ***Full-scale fire gallery*** for burn testing of mine combustibles (such as conveyor belting and wood) under controlled airflows
- ***Mine fire preparedness site*** for developing and/or evaluating the latest firefighting technologies.
- ***Numerous quarry sites*** for explosive research and classification, mine railway studies, subsidence abatement, and many other mining-related activities

Lake Lynn Laboratory also affords unique opportunities for research in nonmining applications. For example, studies have been conducted at Lake Lynn to prevent and suppress dust explosions in the grain industry.



Full-scale fire gallery



Fire suppression facility

The NIOSH Lake Lynn Laboratory plays a crucial role in conducting full-scale operational research. Lake Lynn Laboratory has and will continue to make a critical contribution to the safety and health of miners and will help to alleviate mining-related and other problems that affect all U.S. citizens.

For more information on Lake Lynn Laboratory and how this unique facility can be utilized to help you, please contact—

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