Technology News

From the Bureau of Mines, United States Department of the Interior

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Abandoned Mine Lands Program TN #10

Fires in Abandoned Coal Mines and Waste Banks

Objective

Assist in controlling or extinguishing fires that occur in abandoned mine lands (AML) by providing a compilation of information on past fire control projects, the estimated extent of the current problem, and factors affecting the occurrence, propagation, and extinguishment of AML fires. Conventional fire control methods and their probable effectiveness are evaluated.

Background

Fires that occur in abandoned coal mines, waste banks, and coal outcrops constitute a serious health, safety, and environmental hazard from toxic fumes, deterioration of air quality, and subsidence. Although fires on AML occur in every coal-producing State, the severity of the problem varies, with most underground fires occurring in Kentucky, Pennsylvania, and Wyoming. Surface fires are prevalent in Kentucky, Pennsylvania, and West Virginia. Methods to extinguish or control AML fires, including excavation, fire barriers, and sealing, are generally expensive and have a relatively low probability of success (see figures 1 and 2).

Bureau of Mines Study

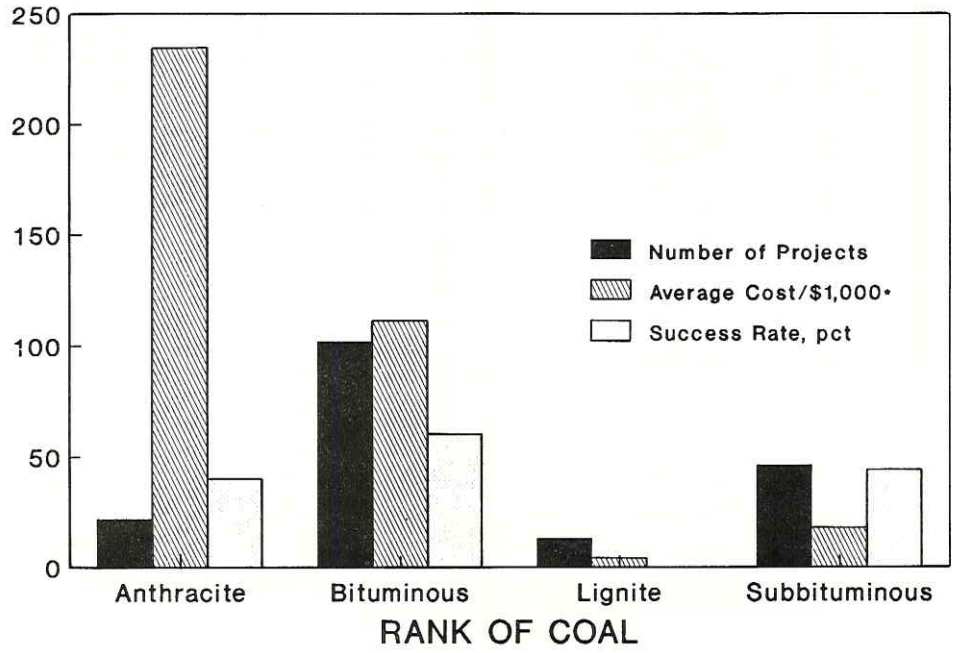
The Bureau compiled information from a variety of sources and found that the problem of AML fires is a serious one. Such fires can involve a high degree of hazard and can be difficult and costly to control. AML fires usually involve smoldering combustion in outcrops, waste banks, or abandoned mines. Given the nature of these fires, it is unlikely that the extent of the problem or the cost of solutions will decrease in the near future.

Although new techniques for locating and controlling and extinguishing fires have been or are being developed, the majority of current AML fire control projects utilize conventional methods and techniques, such as excavation and surface sealing. As shown in figure 2, which is based on data from past fire control projects, an average excavation project costs over $600,000 and has a 70-pct chance of extinguishing the fire. A surface sealing project costs, on the average, only $30,000 but has less than a 50-pct chance of extinguishing a fire. In many cases, however, evaluation, assessment, and planning can improve the implementation and cost effectiveness of a fire control effort.

A U.S. Bureau of Mines Information Circular (IC) on the problem of fires in abandoned coal mines and waste banks is in press.

For More Information

For further information, contact Ann G. Kim at the Pittsburgh Research Center, U.S. Bureau of Mines, Cochrans Mill Road, P.O. Box 18070, Pittsburgh, PA 15236, or telephone (412) 892-6724.



• Anthracite cost/$10,000

Figure 1.—Variation in number, cost, and success rate of AML fire control project with rank of coal.

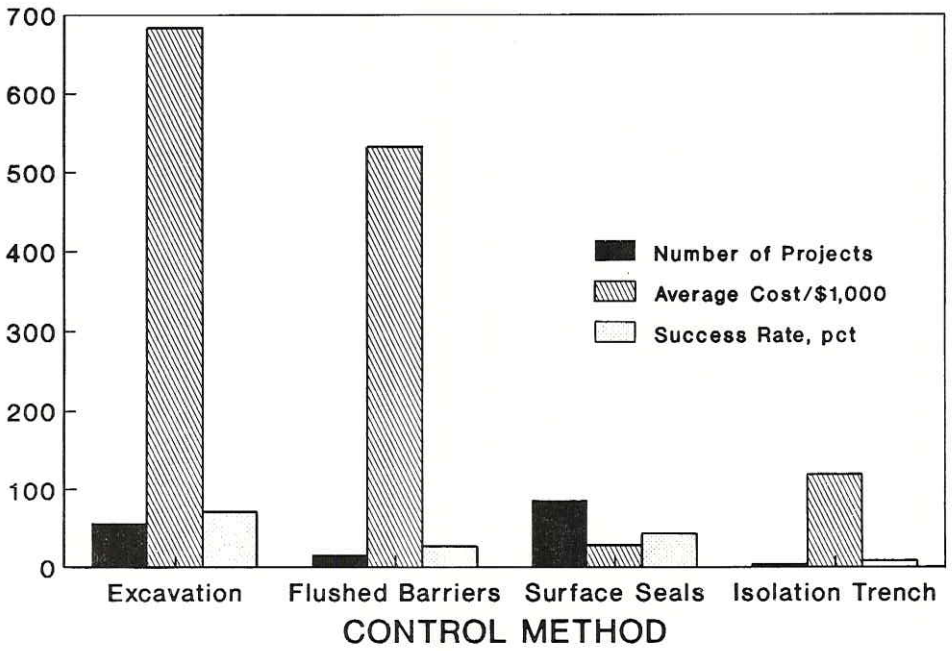


Figure 2.—Average cost and success rate for conventional methods of AML fire control.