NIOSH TECHNICAL REPORT

RESULTS FROM THE NATIONAL OCCUPATIONAL HEALTH SURVEY OF MINING (NOHSM)

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ABSTRACT

The National Occupational Health Survey of Mining (NOHSM) was conducted by the National Institute for Occupational Safety and Health (NIOSH) pursuant to the U.S. Federal Mine Safety and Health Amendments Act of 1977. This Act dictates that the Secretary of Health and Human Services "*... shall, for each toxic material or harmful physical agent which is used or found in a mine, determine whether such material or agent is potentially toxic at the concentrations in which it is used or found in a mine.*"

The three main objectives of this report are: (1) document why and how NOHSM was conducted, for the benefit of future users of the NOHSM database; (2) provide results for most of the types of data which were gathered from NOHSM; and (3) encourage interested parties to use information from the NOHSM database by requesting specific information from the NOHSM project officer or by requesting a copy of the NOHSM PC-based query system.

NIOSH conducted the field portion of NOHSM from May 1984 to August 1989. The survey included a total of 491 mines (60 coal mines and 431 metal-nonmetal mines such as aluminum, gold, sand & gravel, etc.) which employed 59,734 miners, representing 66 mineral commodities. The 491 surveyed mines were selected from a total of 2,131 mines which employed 297,322 miners. Although NIOSH surveyed only a representative sample of mines in each mineral commodity, the data were projected over all of the mines in each of those mineral commodities.

Each mine's survey included three phases: questionnaire, chemical inventory, and worksite visit. The data obtained during the questionnaire described medical services, industrial hygiene practices, and general facility information. The inventory data identified all chemical substances and trade name products found on the mine property and the annual usage rate of each chemical substance. NIOSH inventoried 2,570 chemical substances and 84,939 trade name products. During the work-site visit, the NOHSM surveyors observed and interviewed workers to determine their potential exposures at the worksite. The term **"potential exposure"** has two criteria. First, the NOHSM surveyor must have determined that the health-related agent was in sufficient proximity to a worker such that the agent could have entered or contacted the body of the worker, although the level of exposure was not measured by NIOSH. Second, the duration of the potential exposure must have met the minimum duration guidelines (i.e., a part-time duration was defined as the potential exposure time which was greater than 30 minutes per week [on an annual average] or at least once per week 90 percent of the weeks of the work year). The potential exposures recorded during the worksite visits included chemical substances; trade name products; physical agents; musculoskeletal overloads; welding, brazing, and soldering processes; abrasive grinding processes; and bulk dust. Workers were often potentially exposed to more than one agent. Therefore, the total projected numbers of potential exposures are often greater than the number of workers in the entire mining industry or in a given mining commodity.

The projected numbers of potential exposures, across the entire mining industry were: physical agents 365,332; musculoskeletal overload conditions 710,340; welding, brazing, and soldering agents 188,852. More than 1.1 million potential exposures to chemicals and trade name substances were found in surface shops, alone. Through the bulk dust samples, approximately 214,000 miners were found to be potentially exposed to dust that contained greater than 5 percent quartz.