

Comments on proposed rule
December 14, 2009
DEPARTMENT OF LABOR
Mine Safety and Health Administration
30 CFR Parts 70, 71 and 90
RIN 1219-AB48
Respirable Coal Mine Dust:
Continuous Personal Dust Monitor (CPDM)

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In the first 30 years after implementation of the Coal Mine Health and Safety Act of 1969, considerable progress was made in reducing the dust hazards in mines. However, since about 2000, there has been clear evidence of inadequate health protections for many coal miners. Advanced pneumoconiosis is increasingly recognized throughout the US, but particularly among miners in the coal fields of the southern Appalachian region (SAR). National statistics document that there has been an overall increase in the prevalence of occupational lung disease among US miners, and reports document a profoundly troubling finding of rapidly progressive, disabling, and fatal pneumoconiosis among younger miners, which is also most evident in the SAR. Researchers have concluded that "additional measures to control exposures may be needed to enhance the protection of miners."^{1 2 3 4}

Use of the Continuous Personal Dust Monitor may ultimately be a useful tool for assisting coal mine operators in providing a mine environment that is free of unhealthful exposures to respirable dust. However, it is important that MSHA, in implementing the rules for use of the CPDM, carefully analyze the reasons for the current "inadequate prevention measures" for working coal miners.¹

¹ Antao VC, Petsonk EL, Sokolow LZ, Wolfe AL, Pinheiro GA, Hale JM, Attfield MD. Rapidly Progressive Coal Workers' Pneumoconiosis In The United States: Geographic Clustering And Other Factors. Occupational and Environmental Medicine 2005;62:670-674.

² Centers for Disease Control and Prevention (Antao VC, Petsonk EL, Attfield MD.) Advanced Cases of Coal Workers' Pneumoconiosis --- Two Counties, Virginia, 2006. MMWR - Morbidity & Mortality Weekly Report 2006;55(33)909-13.

³ Centers for Disease Control and Prevention (Attfield MD, Petsonk EL.) Advanced Pneumoconiosis Among Working Underground Coal Miners — Eastern Kentucky and Southwestern Virginia, 2006. - Morbidity & Mortality Weekly Report - MMWR 2007;56(26)652-5.

⁴ Work-Related Lung Disease (WoRLD) Surveillance Report,
<http://www2a.cdc.gov/drds/WorldReportData/> Accessed December 14, 2009

There is evidence that at least five factors are involved.

1. Excessive inhalation of silica^{5 6}
 - a. This has been attributed to an inadequate current enforcement regime for respirable silica (the approach to controlling silica is to reduce the PEL when the proportion of silica has been found to be high in a previous sample from a mine, rather than enforcing a specific and scientifically-supported limit on silica exposure for each coal mining work-shift), and also the absence of targeted dust control measures and enforceable work practice rules for mining conditions that can be reasonably anticipated to result in excessive silica exposure, such as cutting rock.⁷
2. Failure to control day-to-day miner exposures to respirable dust to below the PEL.
 - a. This has been attributed to a) insufficient adherence to continuing measures for controlling dust during mining operations, b) ineffective approaches to dust controls, including lack of personnel and other resources at smaller mines,⁸ and c) submission of samples for compliance purposes under conditions that are not representative of the miners' usual exposures or are falsified.⁹
3. Widespread use of prolonged work-weeks and extended work-shifts
 - a. Current dust limits were based responses for exposures during an 8 hour shift and 40 hour work week. Between 1981 and 2007, the number of hours worked per year by coal miners increased on average by more than 1/3, with the average miner now working considerably more than 40 hours per week.⁹ This results in excessive inhalation and lung deposition of respirable silica and coal mine dusts, and reduced time for dust to be cleared from a miner's lungs.
4. Current occupational dust exposure limits are inadequate. Dust measurements submitted to MSHA for enforcement purposes are on average well below the current 2 mg/m³ standard. Even for mines in the 'hot spot' southern Appalachian region, only a minority of samples reported for compliance purposes are above the limits for either silica or dust. Occupational lung diseases are known to develop among miners who have been exposed during their working lifetime to respirable dust concentrations that have been documented for enforcement purposes to be considerably below the exposures limits.¹⁰ Thus, unless the dust

⁵ Laney AS, Petsonk EL, Attfield MD. Pneumoconiosis among underground bituminous coal miners in the United States: is silicosis becoming more frequent? *Occup Environ Med* (Published Online 22 September 2009)

⁶ Laney AS, Attfield MD. Letter: Quartz Exposure Can Cause Pneumoconiosis in Coal Workers *Journal of Occupational and Environmental Medicine*: 2009;51:867.

⁷ Pollock DE, Potts JD, Joy GJ. Investigation into dust exposures and mining practices in mines in the southern Appalachian region. 2009 SME Annual Meeting and Exhibit, February 22-25, Denver, Colorado, preprint 09-009. Littleton, CO: Society for Mining, Metallurgy, and Exploration, Inc., 2009 Feb; :1-5

⁸ Laney AS, Attfield MD. Coal workers' pneumoconiosis and progressive massive fibrosis are increasingly more prevalent among workers of small underground coal mines in the United States. (In press)

⁹ Attfield M. "Black Lung" presented to MSHA, January 12, 2009.

<http://www.msha.gov/S&HINFO/BlackLung/AttfieldPresentation2009.pdf> Accessed December 14, 2009

¹⁰ NIOSH Publication No. 95-106: Criteria for a Recommended Standard: Occupational Exposure to Respirable Coal Mine Dust. September 1995.

exposure levels reported to MSHA from most US coal mines have been systematically inaccurate over many years, reducing permissible exposures for both respirable silica and mixed mine dusts is both feasible and necessary.

Implementation of the CPDM in light of the above factors:

Use of the CPDM to monitor dust levels cannot directly affect the contribution of silica to the burden of lung disease among coal miners, since the device cannot assess silica exposures. Controlling respirable dust containing silica to the current 2 mg/m^3 PEL for carbon and other non-silica mixed mine dusts is not sufficient protection because of the much greater lung toxicity of crystalline silica (since 1974, NIOSH has recommended that occupational exposure to respirable crystalline silica be limited to 0.05 mg/m^3). If the CPDM is used for dust monitoring, additional dust control measures and work-practice restrictions will still be necessary when potentially silica-bearing rock is disturbed.

The CPDM may be potentially most useful in controlling coal miners' day-to-day dust exposures to below the PEL, when respirable dusts do not contain significant proportions of silica. A work-station or individual job must be chosen for monitoring, and should be documented to be the 'worst-case' by serial sampling. The selection of a monitoring location or job category should be reassessed periodically, or whenever there are changes that may affect the distribution or levels of airborne dust (e.g., mining conditions and methods; mining, roof control, or dust suppression equipment; other dust control practices).

All serial measurements that are stored in the CPDM memory for each shift that the device is used to monitor dust exposures in a mine should be saved in an electronic format. To maximize the utility of the data, it should be uploaded to a web site and be available to the public in both graphic and tabular forms, and available in a database format that facilitates analysis. Measurements that accurately represent the exposure conditions in the MMU, such as coal production by shift, location and measurements of ventilation airflow, water pressures and flows, etc. should also be recorded in a standardized format in an electronic database. To permit a professional evaluation of dust controls by mine health personnel, MSHA inspectors, and employee representatives, each set of measurements from the CPDM should be easily linked to the other variables and measurements by a common linking variable, which identifies the specific date, times, locations, etc. of the measurements. The documentation and data must be retained for one year, and available to mine inspectors during that time.

When the CPDM provides measurements indicating a miner is exposed at or above the PEL for any single 8 hour period during a work-shift, or above a PEL_A (see below) during any 24 or 168 hour period, mine safety personnel must document that a) an analysis of the potential causes was performed, b) corrective actions were proposed based upon best professional judgments, c) the recommendations were implemented, and d)

follow-up sampling documented effectiveness. The required documentation must be retained for one year, and available to mine inspectors.

Smaller mines that may find it difficult to provide equipment and/or personnel resources for dust monitoring and control using the CPDM should be encouraged to collaborate with an independent professional or governmental organization in the purchase, implementation, operation, evaluation, and maintenance of CPDMs. Mines with 50 or fewer underground employees who contract with independent organizations in the application of CPDMs may be permitted to monitor a minimum number of typical shifts rather than each work shift for every mechanized mining unit. If every work shift in each section is not monitored, auditable measures must be in place to assure that the shifts that are chosen for CPDM exposure monitoring are representative in relation to a) production, b) measurements of water pressures and flows, c) face ventilation, and d) other mining and ventilation conditions, methods, personnel, and procedures. For example, if all shifts are not monitored with the CPDM, then each shift that is monitored should have typical face ventilation (e.g., no more than the average airflow that was used during the previous two weeks), and high levels of production (e.g., more than 80% of the maximum for the previous 4 weeks).

For a small mine to be permitted to perform representative rather than continual sampling, the mine must contract with an organization that is approved by MSHA. These organizations must demonstrate initially and on an annual basis that they meet minimum qualifications, including staff levels, training and experience, quantity and quality of equipment, documentation of policies and procedures, program performance, and record keeping.

To prevent excessive dust exposures when CPDM exposure monitoring is used for work greater than 8 hours in any 24 hour period or work schedules of more than 40 hours in any 168 hour period, exposure to respirable dust for each individual miner should be less than an adjusted permissible exposure limit (PEL_A), determined as follows:

For shifts from 10 – 12 hours in any 24 hour period, the PEL_A is $PEL/1.5$.

For shifts from >12 – 16 hours in any 24 hour period, the PEL_A is $PEL/2.0$.

For work schedules from 44-48 hours in any 168 hour period, the PEL_A is $PEL/1.2$

For work schedules from 48-60 hours in any 168 hour period, the PEL_A is $PEL/1.5$

For work schedules with 60 or more hours in any 168 hour period, the PEL_A is $PEL/2$