NMA
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Mr. Marvin Nichols, Director
Office of Standards, Regulations and Variances
MSHA
1100 Wilson Boulevard, Room 2358
Arlington, VA 22209-3939

RECEIVED 6/27/02 MSHA/OSRV

RE: 30 CFR Parts 58 and 72 – Measuring and Controlling Asbestos – Advance Notice of Proposed Rulemaking (ANPRM)

Dear Mr. Nichols:

These comments are submitted on behalf of the National Mining Association in response to the Advance Notice of Proposed Rulemaking (ANPRM) that appeared on March 29, 2002 (67 FR 15134). The National Mining Association (NMA) is the industry trade association representing the producers of the Nation's coal, metals, and nonmetallic minerals; the manufacturers of mining and mineral processing equipment, machinery and supplies; and engineering, financial and other consultative firms that serve the mining industry.

We support MSHA's efforts and those of others to increase protection to miners when they are working in environments where asbestos-containing ore/minerals are present. To successfully increase worker protection from asbestos, one must have a clear understanding as to how asbestos exposure might cause disease in these miners and the steps needed to reduce or eliminate the risk of such disease.

Regulatory interest in these matters arises out of concern for the health hazards associated with asbestos exposure to the general population from the mining of vermiculite at Libby, Montana. Health effects among theses vermiculite miners have been well documented since the late-1970's and mid-1980's (Ross et al 1993). More recently, concern about the general population of Libby has been raised in the media resulting in an investigation of MSHA's role in Libby by the Office of the Inspector General. In the ANPRM notice MSHA highlighted the following six concerns each of which will be addressed:

- Miners may be exposed to asbestos at mining operations where the ore bodies contain asbestos.
- Exposure to asbestos can cause asbestosis, mesothelioma, lung cancer and cancer of the digestive system.

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- Consideration should be given to the recommendation of the Department of Labor's Office of the Inspector General's that MSHA lower its existing Permissible Exposure Limit (PEL) for asbestos to be closer to OSHA's asbestos PEL.
- The potential of miners to be exposed to asbestos exposures when disturbing asbestos-containing material installed at the mining complex must be examined.
- Miners occupationally exposed may bring asbestos home – clothes, person and automobile.
- More sensitive analytical method for monitoring asbestos exposures in the workplace must be developed.

We will address these six points with regard to what regulatory action would be most effective at reaching MSHA's goal of increasing worker protection from asbestos in a mining environment.

Before doing so however we must bring to the agency's attention its obligations under the recently proposed, but not yet finalized, Department of Labor's data quality guidelines and accompanying risk assessment guidelines. More specifically, we call to the agency's attention provision (3) of the draft DOL guidance document, "Adapting the Principles under the Safe Drinking Water Act Amendments for Safety and Health Risk Analyses" which states that the agency (DOL) documents made available to the public, "in support of a regulation" shall specify:

> information, data, or studies, peer-reviewed where available, known to the agency that support, are directly relevant to, or **fail to support any estimate of risk effects and a discussion that either reconciles inconsistencies in the data or information, or explains the rationale used by the agency to rely on the data or information used for the risk analysis** (emphasis added)

Additionally, it goes without saying that the agency, in developing and advancing any Proposed Regulations to further regulate asbestos exposure in the mining industry must comply with the requirements contained in Executive Order 12866 (Regulatory Planning and Review). That order requires agencies to: identify available alternatives, design their regulations in the most cost-effective manner to achieve the legislative objectives, and base their decisions on the best reasonable obtainable scientific, technical, economic or other information concerning the need for, and the consequences of the intended regulation. E.O. §1(b). In addition, if the rule is a significant regulatory action, MSHA must assess the potential costs, and benefits of this action and the reasonable feasible alternatives to the regulation, as well as explain why its proposed action is preferable to all of the identified potential alternatives. E.O. §6(a)(3). It is imperative that the agency, in developing an EA, be cognizant of the dramatic changes that have occurred within the mining industry both in terms of the structure of the industry as well as the production methods employed, including the incorporation of safety and health provisions in mining processes. Simply put, the agency must ensure that significant risk exists under the current regulatory scheme to justify the significant costs that may be incurred under a new regulatory scheme.

Miners may be exposed to asbestos at mining operations where the ore bodies contain asbestos.

Asbestos minerals occur rarely enough in nature to make commercially viable deposits unusual. However, small seams of asbestos can occur occasionally in mines and quarries. These asbestos seams occur in areas with particular geological features (see Nolan et al 1999 and Williams-Jones et al 2001 for a discussion). Generally the seams are visible to the observer as asbestos occurrences, macroscopic in size. In commercial asbestos deposits, the ore is generally a minimum of 2-4% asbestos and easily identified by visual inspection. The extent of amphibole asbestos in the Libby, Montana vermiculite mine is very unusual for any non-asbestos mining operation. The concentration of asbestos in the vermiculite ore body was high enough that commercial asbestos mining at the site was once considered.

MSHA has selected an air monitoring approach to screen for the presence of asbestos in non-asbestos mines. The information available indicates air sampling is unlikely to be effective in identifying asbestos at low concentration and/or in a limited part of the ore body (Nolan et al 1999). Where a small amount of asbestos is present, random air sampling will not be useful for identifying the amount of this fibrous mineral likely to become airborne. Where such asbestos occurrences have been monitored, using both phase-contrast optical microscopy and analytical transmission electron microscopy, exposure levels were only modestly elevated if at all (Nolan et al 1999). Exposure levels similar to those associated with asbestos-related disease at the Libby vermiculite mine (25-130f/mL before 1974) are not known to occur in mines with or without limited areas of asbestos. The concentration of tremolite (or winchite) asbestos at the mine in Libby, Montana was extensive. The potency of the specific fiber types of amphibole asbestos present to induce cancer is of considerable concern (see Wylie and Verkouteren 2000 for a discussion of amphibole asbestos from Libby).

The first step in hazard recognition is the visual identification of asbestos seams in the mine. The identification of bulk asbestos is the first step in controlling asbestos exposures, not air monitoring. What asbestos fiber type or types are present? Where does it occur? Where will it be going (if anywhere)? Will the asbestos be in waste rock or ore bound for the mill? Armed with knowledge of the types of geological locales where asbestos is likely to occur, one can conduct a geological survey of the mine to identify asbestos. Asbestos is a rare mineral, which requires specific types of geological locales and conditions to form. It is important for MSHA to note that cleavage fragments and other fibrous particulates occur in the mining environment and generally do so more frequently than asbestos. These situations present analytical problems, which are largely unique to the mining environment, and different from the manufacturing sector regulated by the Occupational Safety and Health Administration (Langer et al 1979, Langer et al 1991, Langer 2001b).

Exposure to asbestos can cause asbestosis, mesothelioma, lung cancer and cancer of the digestive system.

At modern controlled levels of asbestos exposure, asbestosis is a very rare disease. It is well established in the medical literature that few, if any, asbestosis cases have occurred in non-asbestos mining with the noted exception of Libby vermiculite workers for the reason previously discussed (McDonald et al 1986a, b, Amandus et al 1987a, b, c, Cooper et al 1988, Ross et al 1993). Today, concern is primarily limited to the asbestos-related cancer risk, which has recently been reviewed, by Hodgson and Darnton (2000). They report exposure-specific mesothelioma risk increases depending on asbestos fiber type by 1:100:500 for chrysotile, amosite, and crocidolite respectively. Moreover, they report a differential lung cancer risk between chrysotile (excluding chrysotile textile workers) and the other two amphibole asbestos minerals as between 1:10 and 1:50. For both mesothelioma and lung cancer, chrysotile asbestos is significantly less carcinogenic than the two major commercial amphibole asbestos minerals. Epidemiological studies are available to do similar quantitative risk assessments for mesothelioma and lung cancer from exposure to tremolite asbestos and anthophyllite asbestos. MSHA should extend the risk assessment to include these two fiber types and formulate regulatory policy on the best available medical and scientific information, which requires considering asbestos fiber type.

Regulatory agencies worldwide have yet to address asbestos fiber type in a meaningful scientific and medical way to reduce workers risk of cancer. Adopting this more flexible approach – acknowledging the range in carcinogenic potential depending on asbestos fiber type- would be the most effective approach to reduce the risk of asbestos-related cancer. Note the significant health hazard at Libby, Montana associated with occupational exposure to amphibole asbestos. As asbestos exposures are reduced by use of modern control technology, the principal asbestos-related cancer risk for miners in non-asbestos mines is that intermittent low exposures to amphibole asbestos – particularly crocidolite and tremolite asbestos – will increase their risk of mesothelioma. MSHA in the ANPRM did not address this important health hazard in an adequate manner.

OSHA's current 0.1f/mL PEL is based on a 1984 asbestos risk assessment (which MSHA is also proposing to rely on) associated with a calculated lifetime cancer risk of 3.4 excess cancer cases per 1,000 worker lifetimes. The risk assessment is not asbestos fiber type specific and, particularly with regard to mines, is unreasonably weighted by chrysotile textile industry experience. The chrysotile textile worker experience is not of relevance to most chrysotile-exposed workers and particularly not with regard to miners (Hodgson and Darnton 2000, Nolan et al 2001).

The OSHA risk assessment is no longer state-of-the-art and insufficient attention has been given in the ANPRN to consideration of the types of exposures likely to occur in the mining environment and for which epidemiology studies are most relevant (Langer, 2001a). MSHA needs to focus on that medical and scientific evidence most relevant to assessing asbestos-related disease among mine workers. In addition, the mining environment is different in significant ways from manufacturing processes that use commercial asbestos minerals. Camus et al (1998) reported in the New England Journal *of* Medicine that similar models to those used by OSHA overestimate the risk of chrysotile asbestos-induced lung cancer by at least a factor of 10 among women in a chrysotile mining community. MSHA needs to conduct a modern asbestos-fiber type specific risk assessment prior to determining an appropriate asbestos PEL.

Although asbestos-related cancer of the digestive tract remains a consideration, it is far from a concern. Recent epidemiological reviews indicate the association between increases in colorectal cancer and asbestos are limited and in the modern era of controlled use of asbestos we have largely seen an end to such excesses (Gamble 1994, Weiss 1995). The World Health Organization has clearly expressed doubts about any health hazard being associated with asbestos in drinking water (WHO, 1986). The majority of recent asbestos cohorts studies found a weak, if any, relationship between asbestos exposure and laryngeal/head and neck cancer, which included a large study by the Health & Safety Executive of Great Britain (Browne & Gee 2000). When small excesses of these cancers were observed in asbestos cohorts exposed in about the mid 20th Century, smoking alone and drinking alcohol along were not controlled for adequately. It remains uncertain if the increases in the digestive system cancers are due to asbestos alone. MSHA should review the evidence for digestive system cancer, particularly with respect to miners. For example, Amandus and Wheeler (1987) did not report significant increases in stomach and digestive cancers among miners at Libby, Montana.

Rationale for lowering MSHA's existing permissible exposure limit (PEL) for asbestos.

MSHA's current PEL for asbestos is 2f/mL >5μm in length imaged by phase-contrast optical microscopy. The analytical method is effectively identical to that used by OSHA which has a PEL 20-fold lower than MSHA at 0.1f/mL. Concern has been voiced about the large difference between these two Federal agencies regulating the same substance.

Many new studies characterizing the risks associated with asbestos exposure have been published since OSHA adopted its current standard in 1994, which relied on the state of knowledge in the mid-1980s. It would be useful for MSHA to review this new information in its effort to find the most effective protection to miners from asbestos exposure possible (see References attached to this letter). It is doubtful that simply harmonizing the various Federal PELs for asbestos with the lowest exposure level is the most effective way to achieve this goal.

In addition to asbestos fiber type MSHA needs to consider two important matters in determining a new PEL for asbestos:

- Since 1976 when the 2f/mL PEL for asbestos was adopted what evidence, if any, is available to indicate that exposure between 0.1 and 2f/mL have presented a health hazard in any mining community? MSHA is silent on this matter in the Federal Register notice. The exposures at Libby, Montana were strikingly higher than any current asbestos PEL and mining through occasional asbestos seams in non-asbestos mines are significantly below MSHA's current asbestos PEL (Table 1).

- The OSHA PEL for asbestos is used to monitor and control exposure in an occupational setting where asbestos-containing products, fabricated with one or more fiber type, are being manufactured. The non-asbestos mining environment is a significantly different work environment where asbestos, if present at all, is likely to be at low concentrations in the rocks and only became airborne occasionally if at all. More commonly elongated fragments of rock sometimes referred to as cleavage fragments will also be present (see Langer et al 1979, Langer et al 1991, Nolan et al 1991, Federal Register 1992, Langer 2001b). Cleavage fragments occur rarely in the aerosols generated during asbestos manufacturing but are rather common in the mining environment. These fibrous particulates are known to be significantly lower in cancer potency than amphibole asbestos (see Davis et al 1991, Federal Register 1992). The epidemiological studies of cohorts exposed to cleavage fragments have been negative for asbestos-related disease (Ross et al 1993). MSHA has not adequately addressed the question of how it will deal with distinguishing asbestos from other non-asbestos fibrous mineral particulates in the mining environment.

The potential of miners to be exposed to asbestos when disturbing asbestos-containing material installed at the mining complex must be examined.

It is important to identify asbestos-containing material installed in a mining complex. These materials are most likely associated with structural, mechanical and electrical such as insulation, fireproofing, etc. rather than mining per se. The exposures to commercial asbestos-containing materials among building maintenance and repair workers range for a median value of 0.002 f/mL per year to 0.02f/mL per year at the 90th percentile (Price et al 1992, Nolan and Langer 2001). The exposure estimates reflect the frequency and duration of exposure. Although it seems unlikely, there may be differences between exposures to asbestos-containing materials in a commercial building and exposures to such materials in mining complexes. Here again asbestos fiber type should be of a significant regulatory concern if one takes note of the 500-fold difference in mesothelioma potency between chrysotile asbestos and crocidolite asbestos (Hodgson and Darnton 2000). Clearly, the potency difference is too large to average, and if MSHA is to increase protection of miners, careful concern should be given to asbestos fiber type.

Miners occupationally exposed may bring asbestos home – clothes, person and automobile.

The issue of "take home" exposure is rather complex because although these exposures are likely to be significantly lower than occupational exposures, they may affect a larger number of people. The potency of the asbestos fiber type is again a significant regulatory concern. The medical and scientific evidence of most relevance to MSHA's concerns should come from the asbestos mining experience.

Recently the matter of increases in lung cancer among a cohort of Quebec women with environmental chrysotile (including some with "take home" exposure) was studied and found not to be at increased risk when compared to a cohort of Quebec women without exposure to chrysotile asbestos (Camus et al 1998). Occurrences of mesotheliomas from non-occupational exposure in the Quebec cohort is still under investigation while reports from Italy and Russia indicate take home exposures to chrysotile asbestos rarely, if ever, result in mesothelioma among the non-occupationally exposed in chrysotile mining communities (Silvestri et al 2001, Shcherbakov et al 2001).

The effect of environmental exposure to amphibole-asbestos is different where the increased risk of mesothelioma "… is well established only where mine tailings or local outcrops have been used for roadways or domestic purposes" (Browne and Wagner, 2001). The association between environmental exposure to tremolite asbestos and human mesothelioma is well established in the medical literature (Nolan et al 1991 and references attached). Review of the medical and scientific information available indicates the types of "take home" exposure MSHA is concerned with are not the most significant for risk of asbestos-related cancer in the non-occupationally exposed. MSHA needs to more carefully consider the types of non-occupational exposures associated with asbestos-related disease. For example, in Libby, Montana the vermiculite was commonly used as fertilizer and surfacing material in the general environment, which may very well have been more important than dusty clothes. Exposure to the fibrous amphibole in the Libby environment went well beyond dusty clothes and other take home exposures mentioned in the ANPRM.

More sensitive analytical method for monitoring asbestos exposure in the workplace.

Phase-contrast optical microscopy (PCOM) is very valuable in that it is possible to evaluate many exposure situations rapidly and inexpensively and to determine if fibrous mineral exposures are elevated (Rooker, et al 1982). The various asbestos risk assessment models for lung cancer and mesothelioma are standardized to index fibers $\geq 5\mu m$ determined with PCOM. Analytical transmission electron microscope (ATEM) can then be used to further describe the exposures – asbestos fiber type (or another fibrous mineral) and sub-light visible fibers. In addition, air samplings, that reveal high exposures to fibrous mineral particulates, could be subject to further analysis by ATEM to better understand the nature of the increased exposure. Nolan et al (1999) report on a large number of PCOM air samples to characterize asbestos exposure where asbestos occurs in an isolated part of a non-asbestos mine and have offered an approach to such a problem.

MSHA should be aware that fibrous mineral particulates – formed in a geological process different from asbestos – can occur at a low concentration in many mining operations. The elemental compositions and/or morphologies of these fibrous particulates can be similar to regulated asbestos but there are subtle structural and morphological differences, which differentiate these fibers from asbestos (Langer et al 1991). Although the concentrations are very low in the bulk and air samples, such fibrous particulates are not difficult to identify by ATEM. The asbestos regulations of EPA, CPSC, OSHA and MSHA are not intended to regulate such fibrous particulates as asbestos. Analysis of exposure air monitoring filters by ATEM will highlight the presence of these fibrous mineral particulates and create complex analytical problems and health concerns, that MSHA will need to address.

Conclusion

NMA commends MSHA for its initiative in re-opening the record on asbestos exposure and control in the mining environment. Much has been learned since the agency last visited this issue. Much has also been learned since OSHA last visited the issue. We believe this is an appropriate time to evaluate the state of current knowledge regarding the consequences and control of asbestos exposure. However, we caution the agency that changes to the existing standard must take into consideration the differences between the mining industry environment and that of general industry, the differences between commercial asbestos mining and the occasional occurrence of asbestos on non-asbestos mining operations, the relative risks of various diseases traceable to asbestos exposure in light of current control mechanisms, and the need to define that class of minerals that can be considered as asbestos and therefore in need of stricter regulation.

NMA appreciates this opportunity to comment, and we stand ready to assist the agency in developing appropriate and improved standards for controlling asbestos exposure.

Sincerely,

Bruce Watzman

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