January 24th, 2014

NATIONAL ASPHALT PAVEMENT ASSOCIATION

OSHA Docket Office
Docket No. OSHA-2010-0034
U.S. Department of Labor, Room N-2625
200 Constitution Avenue NW
Washington, DC 20210-0001

Re: Comments on the Proposed Rule — *Occupational Exposure to Respirable Crystalline Silica — 29 CFR § 1926.1053*

To whom it may concern:

This letter is to transmit comments on the above referenced rule on behalf of the Equipment Manufacturer, Contractor, and Labor stakeholders in the long-standing Partnership known as the *Silica/Asphalt Milling Machine Partnership* (the Partnership). NIOSH is a member of this Partnership but may necessarily make comments independently. This government, industry, labor, and academia partnership was formed in 2003 and modeled after the highly successful *Asphalt Fume Engineering Controls Partnership*. Our mission was straightforward — to ensure the protection of our workers. The goals were to provide credible scientific evaluation of silica exposures surrounding asphalt milling operations and to minimize worker exposure through engineering controls and/or best practices where necessary. At the same time, there was an understanding that the Partnership participants would meet or exceed any standard likely to be proposed by OSHA.

We have made significant strides over the 10 years since the inception of the Partnership. Objective data was collected, analyzed, and reported by NIOSH field studies on those work classifications most exposed during milling operations. The National Asphalt Pavement Association (NAPA), the Association of Equipment Manufacturers (AEM), the International Union of Operating Engineers (IUOE), and the Laborers' International Union of North American (LIUNA) assisted in these studies, providing safe access and coordination of operations at typical milling sites around the U.S. The evaluation effort, which involved five major milling machine manufacturers (Caterpillar, Wirtgen, Roadtec, Terex, and Volvo), required hundreds of hours of labor and thousands of dollars as these huge machines were shipped and staffed from site to site.

The successful evolution of engineering controls for half-lane and larger asphalt milling machines began with test efforts to understand where and how dust is generated during the operation of these machines. Efforts were then made to modify and optimize existing wet dust-suppression systems and, ultimately, to develop and test vacuum systems. The technology has now evolved to a combination of optimized vacuum and water systems for suppression, removal, and minimization of silica dust surrounding these asphalt milling machines. In addition the various partners developed and disseminated a best practices document, *Operational Guidance for Water Systems During Milling (Best Practices Bulletin 1/12)* through NAPA and AEM.

This intensive and successful 10-year effort of government, industry, labor, and academia stakeholders enables the Partnership to offer improvements to the proposed rule in the following specific areas:

- **Respirator use in "half lane and larger asphalt milling operations" is neither necessary nor appropriate during milling operations lasting over 4 hours.** The Partnership feels strongly that, for multiple reasons, respirator use in asphalt milling operations is unnecessary, potentially ineffective, and increases workers' risk of injury. Asphalt milling occurs outdoors under extreme temperature conditions, and often with adjacent high speed traffic. Providing respirators appropriate

ASPHALT.
AMERICA RIDES ON US.

5100 FORBES BLVD.
LANHAM, MD 20706

Toll Free 888.468.6499
Phone 301.731.4748
Fax 301.731.4621

AsphaltPavement.org
NAPA@AsphaltPavement.org

for these temperature extremes (powered air-purifying respirators or air-supplied helmets or hoods) reduces workers' ability to see and communicate so as to avoid hazards common in their environment e.g.; moving heavy equipment, tripping hazards, and adjacent high-speed traffic. . Enforcing the use of respirators in this environment is nearly impossible, increases the risk of injury and can increase heat stress for workers.

Applying a 4 hour standard to all industry sectors is inappropriate and does not support the use of available objective data that demonstrates the lack of need for this one-size-fits-all requirement. Our detailed comments point to the use of engineering controls that offset the need for respiratory protection in half lane and larger asphalt milling machine operations.

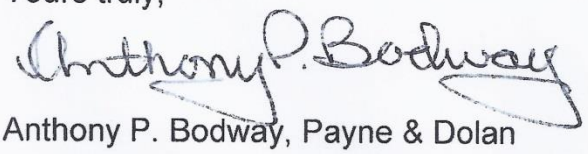
- **Table 1 (Exposure Control Methods for Selected Construction Operations) is essential, but needs improvement to be more effective.** The Partnership applauds the Agency's effort to create a flexible alternative (safe harbor) compliance path by creating Table 1 and urges OSHA to include Table 1 in the Final Rule. As outlined in the following detailed comments, the Partnership recommends the operation "**Milling" be specified as "Asphalt Milling–Half Lane and Larger Drivable Milling Machines"** and we provide further delineation within the body of our comments. The proposed delineation would improve the control of silica-containing dust, provide clearer requirements, enhance employers' understanding, and facilitate OSHA's enforcement of the rule in our industry.

The attached comments and supporting letters from the equipment manufacturers (Appendix I) will address each of these opportunities in the order they occur within the proposed rule.

The Partnership is firm in its belief that the workers in our industry are our greatest asset. In a recent OSHA video relative to the upcoming Silica Rule, Michael Mangum, former Chairman of the NAPA Board of Directors, said: "Our belief is that the very best thing you can do to protect a company is to protect the workers who are, in effect, the heart and soul of that company. The two go together: if we take care of the people who make things happen and deliver the value to the customer, it takes care of the company."

All of the diverse stakeholders of this Partnership are committed to expediting engineering controls and best practice measures to ensure the protection of our workers against silica exposures.

Yours truly,



Anthony P. Bodway, Payne & Dolan

Chairman of the Silica/Asphalt Milling Partnership

COMMENTS

Docket No. OSHA-2010-0034

Federal Register Vol 78, No. 177, p. 56493
September 12, 2013
§ 1926.1053

Executive Summary

The Equipment Manufacturer, Contractor, and Labor stakeholders of the Silica/Asphalt Milling Machine Partnership (the Partnership) appreciate the opportunity to comment on OSHA's Proposed Rule – Occupational Exposure to Respirable Crystalline Silica — 29 CFR § 1926.1053 (Federal Register, Vol. 78, No. 177, p. 56493, September 12, 2013). In general, the Partnership supports the proposed rule as a significant step forward in the effort to protect workers from ill health associated with exposure to respirable crystalline silica. The Partnership was created more than 10 years ago with only one mission — the protection of our workers. We hope that our comments help OSHA improve its proposal such that it provides the maximum protection to our workers, our industry's most important asset. In a recent OSHA video on the upcoming silica rule, Michael Mangum, former Chairman of the NAPA Board of Directors, said: "Our belief is that the very best thing you can do to protect a company is to protect the workers who are, in effect, the heart and soul of that company. The two go together: if we take care of the people who make things happen and deliver the value to the customer, it takes care of the company." The Partnership's comments, suggestions, and recommendations are offered to further that mission.

The volume that follows is organized according to the provisions of the standard. We have commented on nearly all of the provisions, although we believe there are two main points that we recommend the Agency will give careful consideration:

- **Respirator use in "half lane and larger asphalt milling operations" is neither necessary nor appropriate during milling operations lasting over 4 hours.** The Partnership feels strongly that, for multiple reasons, respirator use in asphalt milling operations is unnecessary, potentially ineffective, and increases workers' risk of injury. Asphalt milling occurs outdoors under extreme temperature conditions, and often with adjacent high speed traffic. Providing respirators appropriate for these temperature extremes (powered air-purifying respirators or air-supplied helmets or hoods) reduces workers' ability to see and communicate so as to avoid hazards common in their environment e.g.; moving heavy equipment, tripping hazards, and adjacent high-speed traffic. . Enforcing the use of respirators in this environment is

nearly impossible, increases the risk of injury and can increase heat stress for workers.

Applying a 4 hour standard to all industry sectors is inappropriate and does not support the use of available objective data that demonstrates the lack of need for this one-size-fits-all requirement. Our detailed comments point to the use of engineering controls that offset the need for respiratory protection in half lane and larger asphalt milling machine operations.

- **Table 1 (Exposure Control Methods for Selected Construction Operations) is essential, but needs improvement to be more effective.** The Partnership applauds the Agency's effort to create a flexible alternative (safe harbor) compliance path by creating Table 1 and urges OSHA to include Table 1 in the Final Rule. As outlined in the following detailed comments, the Partnership recommends the operation **"Milling" be specified as "Asphalt Milling–Half Lane and Larger Drivable Milling Machines"** and we provide further delineation within the body of our comments. The proposed delineation would improve the control of silica-containing dust, provide clearer requirements, enhance employers' understanding, and facilitate OSHA's enforcement of the rule in our industry.

Within its provision-by-provision commentary, the Partnership has addressed the issues and questions the Agency described in Section 1 of the preamble (78 Fed. Reg. 56284) that are relevant to our industry. In addition, we have reviewed the technological feasibility analysis and the economic analysis prepared by the Agency and offer comments and suggestions that will help OSHA more precisely estimate the impact of the Final Rule on our industry.

§ 1926.1053(a) Scope and Application

The Partnership agrees with the Agency that it is appropriate to have separate standards: one applicable to general industry and maritime and another applicable to construction. In its summary and explanation of the proposed rule, OSHA asserts that there are operations in construction that are "different enough to warrant modified requirements." The Partnership believes that asphalt milling and paving is one such operation where special circumstances exist that do not typically exist in general industry or maritime operations. First, asphalt milling and paving is a mobile workplace. It is not unusual for milling and paving operations at the end of a workday to be a mile or further away from the location where its workday began. This mobility introduces variables that have implications on how regulated areas are established and maintained, as well as on the representativeness of exposure assessments. Second, asphalt milling and paving typically occurs under very hazardous conditions, most often

adjacent to vehicular traffic passing at excessive speeds. These conditions make the use of some types of engineering controls — and certainly the use of respirators — infeasible and unsafe. Third, asphalt milling and paving occurs outdoors where extreme heat and cold can affect workers' ability to wear protective equipment, particularly respirators, and the effectiveness of control measures.

In response to the Agency's questions in Issue 31 of the preamble (78 Fed. Reg. 56287) which relates to the scope of the construction rule, the Partnership believes the Agency is correct in applying the proposed § 1926.1053 to all construction operations. Construction workers are very mobile. They frequently move from employer to employer and from operation to operation. For example, it is not unusual for a worker to be employed as a concrete worker for one employer and as a road-milling worker for another, depending on the types of construction projects being conducted in his/her area. The Partnership believes that construction workers should be protected from the effects of silica exposure regardless of where they work. In addition, exempting some operations from the rule would establish a situation where a worker could be exposed to silica dust at an operation where silica exposure is unregulated and later experience the symptoms of silica-related disease while employed at a different, regulated site. This situation would not only place an unfair burden on the regulated employer but also would obscure the cause of the worker's disease, hampering future epidemiological studies and potentially reducing the understanding of the relationship between silica exposure and disease.

§ 1926.1053(a) Definitions

Objective Data: The Silica/Asphalt Milling Machine Partnership has collected both personal hygiene and real-time respirable silica dust monitoring data for the past 10 years as we developed today's effective water and evacuation system engineering controls. NIOSH Pittsburgh Research Laboratory and NIOSH Cincinnati conducted the real-time monitoring during extensive field trials while NIOSH Cincinnati conducted personal hygiene sampling. The methods in both cases were NIOSH-recommended sampling/analytical protocols and statistically designed procedures, and were both used to evaluate the effectiveness of engineering controls designs. The definition of objective data should allow for the use of engineering controls development data, such as NIOSH-approved real-time respirable silica dust monitoring data, in support of personal hygiene sampling for a particular engineering controls design. It should also allow for the use of NIOSH-recommended methods for collecting personal hygiene data. As long as the machine designs and worker exposure situations remain the same, and so long as approved procedures are used for collecting, analyzing, and reporting the data, there should be no time limit on the use of such credible data as the data base. This huge, statistically powerful database collected by the Silica/Asphalt Milling Machine Partnership provides significantly more accurate representation of exposures than

would likely be achieved otherwise (see NIOSH EPHB Reports No. 282-11b; -12a; -14a; -15a; -16a; -17a; -18a; -19; -20; -21; -22; -23a; and -25a).

§ 1926.1053(c) Permissible Exposure Limit (PEL)

The original mission of the Silica/Asphalt Milling Machine Partnership was clear from the 2003 outset. We would provide for the protection of workers surrounding asphalt milling operations. The growing awareness of silica exposure as a serious potential worker-health issue was foremost in our discussions. Our primary goal to help achieve this mission was to develop engineering controls and/or best practices that would ensure worker protection. We would follow OSHA's hierarchy of controls thought process. A natural question arose as to what criteria would we use to design these controls and best practices? We were made aware that OSHA was working on a proposed change for the silica rule as it affects construction. After significant discussion, it was clear we would make it a goal to ensure exposures would be below any PEL that OSHA was likely to implement.

Our starting reference points were the NIOSH REL of 0.05 mg/m^3 TWA and the ACGIH TLV® of 0.025 mg/m^3 TWA. Our thought process was that if we could meet or exceed the lowest recommend limits today, it was likely that we could do so when the OSHA rulemaking process is complete. It is important to note, however, that while engineers need definitive targets to design against, the overarching mission of this Partnership effort was to maximize the protection of workers through innovative solutions, regardless of the numeric standards. In this context, the numeric standards would be milestones, not a final target.

§ 1926.1053(d) Exposure Assessment

Our interest and suggestions for improvement in the proposed exposure assessment provisions are as follows:

- It is important to note that the NIOSH data referenced in the proposed rule (Silica PEA Chapter IV, IV-454 Baseline Conditions and Exposure Profile for Large Driven Milling Machine Operations, Table IV, C-64) only includes data collected by the Silica/Asphalt Milling Machine Partnership through 2006. This data represent the early stages of the Partnership where we were experimenting with water flow rates and pressures so as to understand how to control dust surrounding the cutter drum. It does not include the vast amount of data representing the period of optimized water and evacuation designs beginning in 2008 (NIOSH EPHB Reports No. 282-17a; -18a; -19; -20; -21; -22; -23a; and -25a). The year 2007 was a turning point in the success of engineering controls development. This year, the Partnership met with the NIOSH Pittsburg Research Laboratory scientists who shared a wealth of experience in terms of

water nozzle design and placement for the control of silica dust. We also learned of a real-time respirable silica dust monitor that NIOSH Pittsburg used to evaluate design prototypes. NIOSH data collected during extensive water system prototype trials in 2008 and 2010 deployed 10 of these area monitors with supporting NIOSH statistical experiment design and analysis. The result was water configurations that were effective followed by evacuation systems that were even more effective.

- The nature of asphalt milling operations is one of mobile work areas and many different milling sites. As such, asphalt milling operations do not fit the fixed construction site context for regulation. Recognition of this factor in exposure assessment is suggested.

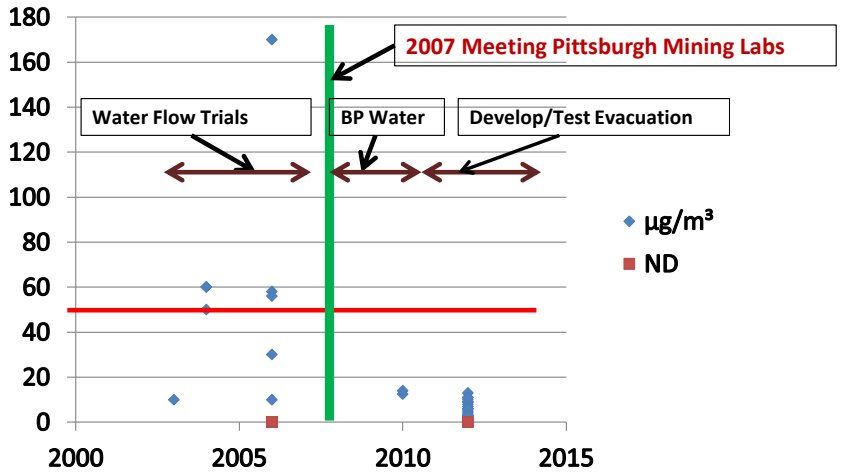
- Because of the number of milling work areas that occur during the course of a year and due to the cost of TWA personal hygiene surveys, we must rely on objective data for purposes of regulation compliance. The nature of asphalt milling operations accommodates this concept as the job classifications most exposed are similar from job to job, and the NIOSH statistically designed sampling protocol was intended to generate statistically reliable data. The design included multiple sites and multiple days to narrow confidence bounds so as to account for any momentary variability from site to site.

- The Partnership has collected data for 10 years as we intensively pursued maximization of exposure reduction via engineering controls and best practices. This data, which reflects the evolution of engineering controls, was collected by NIOSH, analyzed by NIOSH, and reported by NIOSH. This data was collected according to NIOSH sampling and analytical protocols and statistically designed methods for narrowing confidence bounds on the data (see NIOSH EPHB Reports NO. 282-11b; -12a; -14a; -15a; -16a; -17a; -18a; -19; -20; -21; -22; -23a; and -25a). Some of this data is personal hygiene data, while other data represents the evaluation of prototype engineering controls for exposure reduction and is very relevant to exposure assessment. In 2010, OSHA also collected TWA data at a site in Bonduel, Wisconsin (see Appendix II, Whitney Long, CIH, “Asphalt Milling — With Supplemental Engineering Controls,” August 11–12, 2010).

- The Partnership recommendations to improve Table 1 Methods of Compliance for half-lane and larger asphalt milling machines is based upon objective data collected and reported over this 10-year period by NIOSH and OSHA (See Exhibits I and II, Graphical representation of personal hygiene data).

EXHIBIT I

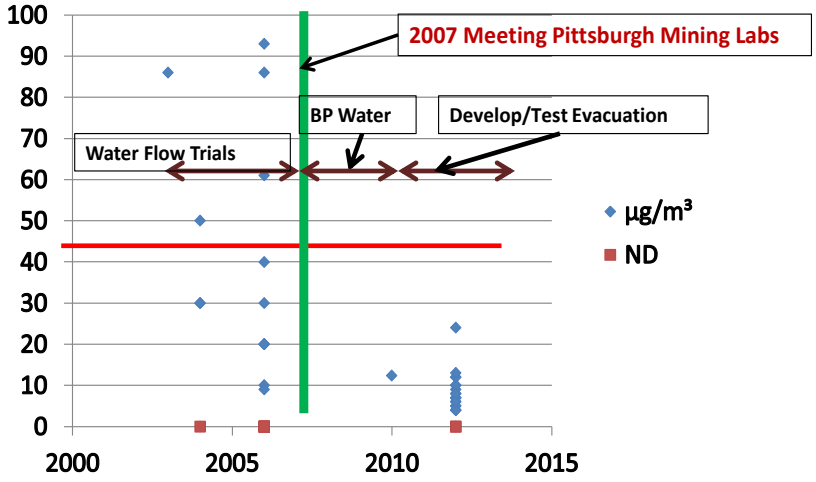
OPERATOR TWA EXPOSURES 2003–2012



NIOSH EPHB Report No. 282-11b; -12a; -14a; -15a; -16a; -23a; -25a
Long, August 11–12, 2010

EXHIBIT II

GROUND MAN TWA EXPOSURES 2003–2012



NIOSH EPHB Report No. 282-11b; -12a; -14a; -15a; -16a; -23a; -25a
Long, August 11–12, 2010

§ 1926.1053(e) Regulated Areas and Access Control

Given the recommended changes to Table 1(Exposure Control Methods for Selected Construction Operations), we do not expect this provision to apply to half-lane and larger asphalt milling machines. However, while this provision would not apply to half lane and larger asphalt milling machines, OSHA might consider how this provision would be applied for other mobile operations as opposed to stationary construction sites. Perhaps a regulated area could be defined by proximity to an operation where silica-bearing dust is generated. This might be different from one operation to another.

§ 1926.1053(f) Methods of Compliance

The Partnership supports the Agency's general approach to the methods of compliance for the proposed rule with some significant modifications. Paragraph (f)(1) outlines the hierarchy of controls applicable to silica exposure. It is essential that the agency maintain its position that first preference be given to engineering and work practice controls over personal protective equipment. Respirators are simply not a workable control measure in asphalt milling operations, even when limited to shifts lasting longer than four hours, as required in the proposed Table 1. Using respirators is problematic in the temperature extremes typically experienced in asphalt milling. Respirators appropriate for use in extreme temperatures restrict visibility to such an extent that they cannot be safety in an environment with moving heavy equipment, many tripping hazards, and adjacent traffic passing at high speeds.

Paragraph (f)(2) of the proposed rule sets out requirements for specific operations, including Milling in Table 1(Exposure Control Methods for Selected Construction Operations). For the operations included in the table, specific control measures are listed and operations that implement those control measures as described are provided a safe harbor. That is, they are assumed to be in compliance with the PEL and are exempt from the requirements for exposure monitoring and medical surveillance. The Partnership supports this novel concept, but is very concerned that the way the Agency has implemented it is not workable for our industry. We have several recommendations:

First, the partnership recommends that in the first column of Table 1, the Agency replace the operation title, **"Milling"** with **"Asphalt Milling – Half-Lane or Larger Drivable Milling Machines."** This change would have the effect of separating concrete milling and walk-behind milling from asphalt milling. The Partnership believes, based on the Agency's analysis of technological feasibility (see, e.g., page IV-458), that the exposures in asphalt milling are very different from those that are experienced with concrete milling and walk-behind milling. In addition, the Partnership does not believe that the controls demonstrated to be effective for asphalt milling would be as effective in concrete milling or walk-behind milling.

Second, the Partnership recommends two specific control technologies for asphalt milling:

1) For half-lane or larger drivable asphalt milling machines purchased after January 1, 2017 — manufacturer-installed water spray system using spray nozzle system designed to maximize dust suppression and an air contaminant vacuum system. Both systems to be installed and effective at the cutting drum and the conveyer.

2) For half-lane or larger drivable asphalt milling machines purchased prior to 2017 — a water spray system equipped with nozzles designed to maximize dust suppression and delivering water amended with a surfactant or wetting agent to the cutting drum and the conveyor.

We further recommend that the control systems described in Items 1 and 2 above be visually inspected daily by a competent person to ensure that clogged nozzles are identified and cleaned and that all pressure and water flow monitoring devices are working properly. In addition, we recommend an annual inspection be required to ensure the systems are operating as designed. This annual inspection should be conducted by a qualified person with training provided by the specific milling machine manufacturer.

The partnership believes the Agency can be confident that asphalt road milling machines as described in Items 1 and 2 above and inspected as recommended will reduce worker exposures to below the PEL without the use of respirators. The personal breathing zone eight-hour TWA exposure data collected by NIOSH and presented in NIOSH EPHB Report No. 282-23a (February 2013) and NIOSH EPHB Report No. 282-25a (July 2013) conclusively show that road milling machines with the controls described in Item 1 will consistently achieve compliance with the PEL. The ventilation systems have been designed by the milling machine manufacturers based on numerous studies conducted by NIOSH. In these studies NIOSH conducted tracer-gas tests to evaluate and optimize the capture efficiency of new designs and configurations of ventilation systems for milling machines for all of the major manufacturers. The average capture efficiency for the ventilation systems evaluated by NIOSH ranged from 86 percent to more than 99 percent. (NIOSH EPHB Report No. 282-18a (December 2011), NIOSH EPHB Report No. 282-19a (September 2011), NIOSH EPHB Report No. 282-20a (December 2011), NIOSH EPHB Report No. 282-21a (February 2013). and NIOSH EPHB Report No. 282-22a (November 2012))

The Partnership has worked closely with NIOSH to evaluate water spray systems on asphalt road milling machines as well. During this 10-year effort NIOSH researchers evaluated machines from all of the major manufacturers with the purpose of identifying the combination of nozzle design, water flow rate, and pressure that would maximize

dust suppression. NIOSH collected volumes of data on the emissions of silica-containing dust from milling machines with different configurations of water spray systems. NIOSH identified the significant variables and conducted experiments designed to optimize dust control (NIOSH EPHB Report No. 282-12a (2007), NIOSH EPHB Report No. 282-15a (2009), NIOSH EPHB Report No. 282-14a (2009), and NIOSH EPHB Report No. 282-16a (2009)). NIOSH often changed variables several times each shift during their research and the few eight-hour TWA exposure measurements they collected were not representative of the optimum performance of water spray alone. Nonetheless, based on this research, asphalt road milling machine manufacturers have designed effective water spray systems for new machines and retrofit systems for older machines. This document provides letters of commitment from all of the major asphalt milling machine manufacturers to make these systems available by January 2017 (see Appendix I).

The partnership is convinced that the water spray systems being provided by milling machine manufacturers for retrofitting older machines are effective at controlling worker exposures to below the proposed PEL, particularly when the water is amended using surfactants as described by Van Rooij and Klaasse (2007). The Rooij and Klaasse study demonstrated that amending the water used in an aerosol dust-suppression system with a foaming agent reduced worker exposures by 4–5 times when compared to water aerosol alone. In this study, respirable quartz exposures were reduced from an average of 65 µg/m^3 (arithmetic mean of four samples ranging from 42 to 100 µg/m^3) using water alone to 14 µg/m^3 (arithmetic mean of eight samples ranging from 4 to 30 µg/m^3) when amended water was used.

A further level of protection is provided by the Partnership's recommendation that these control systems be inspected daily by a competent person and inspected annually by a qualified person with training from the appropriate milling machine manufacturer. Such inspections will ensure that the control systems are operating as designed and remain effective. Finally, the Partnership has developed a best practices guideline for controlling silica exposures during asphalt milling and has distributed it to the members of its associations. This document describes best practices to ensuring that water delivery systems are inspected and functioning to reduce dust emissions during asphalt milling. A copy of this concise, easy-to-read tri-fold brochure, which was jointly published by the National Asphalt Pavement Association and the Association of Equipment Manufacturers, is included as Appendix III.

Based on the compelling data described above on the performance of the recommended controls augmented by daily and annual inspections, the Partnership recommends that the Agency remove the requirement in the proposed Table 1 that asphalt milling operations use respirators when road milling is conducted for more than

4 hours. The available data clearly demonstrates that respirators are not needed and, as previously stated, their use is unsafe in asphalt road milling operations.

§ 1926.1053(g) Respiratory Protection

In 2003 when the Silica/Asphalt Milling Machine Partnership was formed, we set out to support OSHA's hierarchy of controls exactly as proposed in paragraph g(i) of the proposed rule. Our goal was to develop effective engineering controls and/or best practices to ensure workers are protected against potential silica exposures. We agree with OSHA that "Engineering controls are reliable, provide consistent levels of protection to a large number of workers ..." We also agree with OSHA, "In many workplaces, these conditions for effective respirator use are difficult to achieve. ... In addition, use of respirators in the workplace presents other safety and health concerns. Respirators impose substantial physiological burdens on some employees." Respirators are not a workable solution for these large, mobile asphalt milling operations for some of the following reasons:

- Much asphalt milling occurs during the summer months when temperatures can reach 110–120°F. In addition, the process of milling asphalt pavement generates significant heat. Respirator use in typically hot temperatures can contribute to heat stress and can cause acute injury compared to the marginal benefit for this potential chronic illness.
- These large, complex milling operations are conducted in an open, mobile environment with personnel working on the ground and around the machine while live traffic is often nearby. This is a common and necessary part of the operation. Visibility and freedom to communicate are absolutely key to safe and effective operations.
    - The operator must have clear vision for loading trucks and communication with the truck via two-way or CB radio.
    - There must be two-way communication with crew members that may include use of headset and boom microphones.
    - Backing up happens constantly during the course of a day. There must be clear vision of personnel, equipment, ground structures, and traffic for safe maneuvering ability.
    - There are often necessary voice/verbal communications that are not accompanied by microphone.

The Silica/Asphalt Milling Machine Partnership has spent 10 years of intense effort working with NIOSH to develop effective engineering controls to ensure workers are protected. The measures we propose for paragraph f(2), Table 1 of the proposed rule will provide a level of worker protection that is in keeping with the intent of the proposed rule.

§ 1926.1053(h) Medical Surveillance

Given the Industry is committed to effective engineering controls and best practices in keeping with OSHA's proposed hierarchy of controls in paragraph g(1), there would be no respirator use and the attendant medical surveillance requirement. See comments regarding paragraph f(2), Methods of Compliance, Table 1.

§ 1926.1053(i) Communication of Respirable Crystalline Silica Hazards to Employees

The proposed standard contains a number of requirements that are not directly relevant to the comments of the Partnership on specific technical aspects of the proposal relating to the milling industry. Various portions of these proposed requirements may be the subject of comments by individual members of the Partnership with interests that are broader than the specific industry proposals of concern to the Partnership.

One such proposed requirement is the communication of silica hazards to employees. The Partnership is committed to observing HazCom requirements and training provisions as specified in the proposal. As described elsewhere in this presentation, the Partnership presumes that workers engaged in these highway milling operations will receive appropriate training. The Partnership has recently published an Operational Guidance Document for maintaining milling machines and limiting exposure. Each manufacturer also provides operational manuals for their specific machinery that conform to the HazCom requirements.

§ 1926.1053(j) Recordkeeping

The Silica/Asphalt Milling Machine Partnership has collected objective data over a 10-year period that statistically represents the job classifications potentially most exposed in half-lane and larger asphalt milling operations. OSHA should clarify that if an operation provided the controls outlined in Table 1, no further records of objective data would be required.

§ 1926.1053(k) Dates

The various milling machine manufacturers of the Silica/Asphalt Milling Machine Partnership have provided NAPA with letters outlining their company's commitment to standardize engineering controls on the half lane and larger asphalt milling machines (see Appendix I). Because of the extensive nature of design, tracer gas optimization, and field testing in accordance with NIOSH recommendations, the timing for having engineering controls in place varies by manufacturer. Some will necessarily be sooner than others but in all cases the letters attached to these comments as Appendix I support the changes proposed for paragraph f(2) Table 1, Methods of Compliance. Dependent upon where each manufacturer is in its design, optimization, and testing process, the proposed date of 1 year after the effective date of the rule in paragraph k(2)(ii) may or may not be appropriate. It is in everyone's best interest, not the least of which the worker's, to ensure no conflict with the Industry's proposed timeline for having controls in place as set out in the proposed changes to Table 1. The proposed timing represents a significant and expedited effort on behalf of the asphalt milling machine manufacturers.

Technological Feasibility Analysis (OSHA Preliminary Economic Analysis and Regulatory Flexibility Analysis 2013)

The Partnership has reviewed the technological feasibility analysis for millers using portable and mobile machines contained in OHSA's Preliminary Economic Analysis (pages IV-452–484) and, in general agrees with the Agency's conclusion that achieving compliance with the proposed PEL in asphalt milling and paving is feasible. However, the Partnership offers the following observations, comments, and recommendations that are intended to help the Agency improve this analysis.

First, the Partnership is concerned that the analysis conducted by the Agency to support the proposal is overly inclusive and, as a result, reduces the precision of the analysis. This section, as written, includes three operations: walk-behind milling machines, milling on concrete substrates, and asphalt milling. These operations are very different and have different exposure potentials. In its analysis, OSHA observes that "silica emissions could ... be higher during concrete milling than asphalt milling." Citing both NIOSH and Wirtgen the Agency states:

> This difference is due to the potential for higher silica content in concrete compared with some asphalts and also due to the softness and "stickiness" of asphalt milled warm, which likely helps reduce separation of the pavement components and perhaps limits dust release in hot weather (NIOSH EPHB Report No. 282-14a (2009); Wirtgen (2010)).

The partnership agrees that exposures in concrete milling are very likely to be higher than exposures in asphalt milling and is concerned that this factor may have led the agency to require respirator use in asphalt milling where it is not needed and, in fact, is inappropriate.

The data OSHA relied upon for this analysis is very limited and is based primarily on experimental studies conducted by NIOSH under the Partnership from 2003 to 2008. During these years, the NIOSH data represented experimental conditions in which the water flow rates were varied and different water spray nozzles were used, often in the same work shift. The purpose of these studies was to determine the most effective combination(s) of equipment, water flow, and procedures for further evaluation.

On page IV-456, OSHA notes that the earliest NIOSH report (NIOSH EPHB Report No. 282-11b (2004)) represents an atypical situation in which the contractor was using a milling machine for road demolition. The road had multiple layers: a top layer of asphalt (8–12 inches deep), a layer of crushed aggregate (0–10 inches deep), and a base layer of concrete. All three layers were removed as part of this demolition. The samples of bulk material collected as the road was being demolished ranged from 12–28 percent, which is appreciably higher than the silica content that would be expected in asphalt alone. Typical asphalt road milling removes 1.5–4 inches of asphalt and does not involve milling any concrete.

The purpose of the study was to observe the effects of changing water flow rates and pressures and different types of nozzles on dust emissions and workers' exposures. It should be noted that the nozzles evaluated for this study were not designed exclusively for dust control. Their primary purpose was the delivery of cooling water to the rotating drum's cutting teeth. During the two-day study, water flow rates and pressures were varied and two different nozzles were evaluated. Clearly the exposure data generated by this study could not be considered representative of any typical asphalt milling project that would be covered by a future Final Rule. Three of the nine samples in OSHA's exposure profile (Table IV.C-64, page IV-455) that exceed the proposed PEL are from this atypical study.

The other four NIOSH studies that OSHA relies upon for its exposure profile (NIOSH EPHB Report No. 282-12a (2007); NIOSH EPHB Report No. 282-15a (2009); NIOSH EPHB Report No. 282-14a (2009); and NIOSH EPHB Report No. 282-16a (2009)), were also conducted to evaluate the effects of water flow rate and pressure on machines equipped with existing typical water pray nozzles. The Partnership believes that the nozzles in place during these studies were not specifically designed for dust control and that the purpose of these studies was to optimize the performance of existing equipment by identifying the water flow and pressure that best reduced emissions of silica-containing dust.

In the years subsequent to OSHA's analysis, NIOSH has completed more evaluations of a variety of equipment and controls and has generated additional 8-hour TWA personal exposure measurements that will augment OSHA's understanding of silica exposure during asphalt milling operations. NIOSH researchers conducted two studies (NIOSH EPHB Report No. 282-23a (February 2013) and NIOSH EPHB Report No. 282-25a (July 2013)) in which they collected data on milling machines from two manufacturers, Wirtgen and Roadtec. Both of these studies were conducted with the assistance of the Partnership. The milling machines evaluated in these studies were new machines equipped with the latest available dust-control technologies. Both were equipped with a water spray systems with nozzles designed to maximize dust control in addition to a vacuum exhaust system at the milling drum and the conveyer. In June through August 2012, NIOSH collected 22 personal breathing zone samples for evaluating 8-hour TWA silica exposures on four sites in Wisconsin (NIOSH EPHB Report No. 282-23a (February 2013)). Similarly, In September and October 2012, NIOSH collected 20 personal breathing zone samples for evaluating 8-hour TWA silica exposures on seven sites in Indiana (NIOSH EPHB Report No. 282-25a (July 2013)). The results of all 42 personal breathing zone samples taken in these studies were less than the proposed PEL. In fact, none of the samples results exceeded the proposed Action Level.

The most recent NIOSH data, coupled with the commitment the equipment manufacturers have made to provide effective water spray technology and vacuum dust collection systems on all new milling machines within the next two years (Appendix I) should give confidence to the Agency that worker exposure in asphalt paving can be consistently maintained below the PEL without the use of respirators.

Furthermore, the Partnership has confidence that when older milling machines are retrofitted with water spray systems specifically designed to maximize dust control (which are currently available from milling equipment manufactures) and when this equipment is used with water that has been amended with surfactants, as the Agency describes citing Van Rooij and Klaasse (2007), silica exposures can be consistently maintained below the PEL without the use of respirators.

The partnership recommends OSHA revise its technological feasibility analysis in three ways:

- First, conduct the separate analyses for asphalt milling and concrete milling;
- Second, include the new, compelling NIOSH data in its analysis; and
- Third, conclude that exposures in asphalt milling operations can be reduced to achieve compliance with the proposed PEL without the use of respirators.

Economic Analysis (OSHA Preliminary Economic Analysis and Regulatory Flexibility Analysis 2013)

For purposes of estimating the cost of compliance for half-lane and larger milling machines, we offer the following estimates. The experience of contractor members of this partnership is that one TWA personal hygiene survey of the crew in operation costs in the range of $1,500–$2,000. According to a survey conducted by the National Asphalt Pavement Association, 68.3 million tons of reclaimed asphalt pavement (RAP) was used in asphalt mixes in 2012 (NAPA, 2013). It is conservatively estimated that an average milling job generates approximately 2,500 tons of RAP. Pairing these estimates suggests there are approximately 27,000 asphalt milling jobs completed annually. The estimated cost to conduct a single eight-hour TWA survey industrywide annually would then be in the range of $40.5 million to $54 million. In order to create an objective data base for a single company, the cost may be prohibitive, dependent upon how much testing is required to meet the “objective data base” criteria.

REFERENCES

Hansen, K., and A. Copeland (2013). Annual asphalt pavement industry survey on recycled materials and warm-mix asphalt usage: 2009–2012. (Information Series 138). National Asphalt Pavement Association, Lanham, Md.

Long, Whitney (2010). Asphalt milling with supplemental engineering controls…OSHA Air Monitoring: Personal Breathing Zone Crystalline Silica.

National Asphalt Pavement Association [NAPA] and Associated Equipment Manufacturers [AEM] (2012). Operational guidance for water systems during milling operations. Best practices bulletin 1/12

[NIOSH EPHB Report No. 282- 11b] National Institute for Occupational Safety and Health, 2004. Results of a pilot study of dust control technology for asphalt milling.

[NIOSH EPHB Report No. 282- 12a] National Institute for Occupational Safety and Health, 2007. In-depth survey of dust control technology for asphalt milling.

[NIOSH EPHB Report No. 282- 14a] National Institute for Occupational Safety and Health, 2009. In-depth field evaluation…Dust-control technology for asphalt milling.

[NIOSH EPHB Report No. 282- 15a] National Institute for Occupational Safety and Health, 2009. In-depth field evaluation…Dust-control technology for asphalt milling.

[NIOSH EPHB Report No. 282- 16a] National Institute for Occupational Safety and Health, 2009. In-depth field evaluation…Dust-control technology for asphalt milling.

[NIOSH EPHB Report No. 282- 17a] National Institute for Occupational Safety and Health, 2011. In-depth Survey Report, dust control technology for asphalt-pavement milling.

[NIOSH EPHB Report No. 282- 18a] National Institute for Occupational Safety and Health, 2011. Dust-control technology for asphalt-pavement milling controlled-site testing at state highway 47, Bonduel, Wisconsin.

[NIOSH EPHB Report No. 282- 19a] National Institute for Occupational Safety and Health, 2011. A laboratory evaluation of capture efficiencies of the Vacuum cutting system on Wirtgen W 250 cold milling machine at Payne & Dolan Inc., Racine Wisconsin.

[NIOSH EPHB Report No. 282- 20a] National Institute for Occupational Safety and Health, 2011. A laboratory evaluation of a prototype local exhaust ventilation system on a Terex cold milling machine at Terex Roadbuilding, Oklahoma City, Oklahoma.

[NIOSH EPHB Report No. 282- 21a] National Institute for Occupational Safety and Health, 2013. A laboratory evaluation of a local exhaust ventilation system on a Roadtec cold milling machine at Roadtec, Chattanooga, Tennessee.

[NIOSH EPHB Report No. 282- 22a] National Institute for Occupational Safety and Health, 2012. A laboratory evaluation of a local exhaust ventilation system on a Caterpillar cold milling machine at Caterpillar, Minnesota.

[NIOSH EPHB Report No. 282- 23a] National Institute for Occupational Safety and Health, 2013. Control technology for crystalline silica exposure during pavement milling using a Wirtgen milling machine equipped with a vacuum cutting system.

[NIOSH EPHB Report No. 282- 25a] National Institute for Occupational Safety and Health, 2013. Control technology for crystalline silica exposure during pavement milling using a Roadtec milling machine equipped with a local exhaust ventilation system.

Van Rooij, J.G.M., and J. Klaasse (2007). Effect of additive in spraying water of asphalt milling machine on the dust and quartz exposure of workers. *Tijdschrift voor toegepaste Arbowetenschap* 1(2):3-5.

APPENDIX I

Letters Of Commitment From Milling Machine Manufacturers

CATERPILLAR®

Caterpillar Inc.
100 NE Adams St.
Peoria, IL 616129

January 14, 2014

Mike Acott
President
National Asphalt Pavement Association
5100 Forbes Blvd
Lanham, MD 20706
(301) 731-4748
macott@asphaltpavement.org

Dear Mr. Acott,

I am writing on behalf of Caterpillar Inc. and its subsidiaries in support of NAPA's and AEM's position regarding improved technology on milling equipment in response to OSHA's proposed silica regulation. As the world's leading construction equipment manufacturer Caterpillar is deeply committed to the safety and health of construction employees worldwide. For that reason, Caterpillar is continually improving safety options on its equipment and is developing new technologies to enhance the safe use of its machines.

Specifically, for milling equipment, Caterpillar currently provides a water-fed dust suppression system on its half-lane and full-lane milling equipment and is in the process of improving dust suppression technology for all of its non-utility milling equipment. After consultation with AEM, NAPA, and NIOSH regarding effective water-fed dust suppression systems on half-lane and full-lane asphalt milling machines, Caterpillar is committed to developing and offering optimized water-spray dust-suppression systems (consistent with the B2 configuration tested by NIOSH and OSHA) with the demonstrated ability to drastically reduce user exposure to dust and silica by January 1, 2015 on all of its half-lane and full-lane milling machines. In addition, by January 2017 in the U.S., Caterpillar intends to introduce, as a standard attachment, on its half-lane and full-lane asphalt milling machines, a dust evacuation system that will consistently and reliably reduce dust and silica to below the proposed permissive exposure levels for all operations, thus eliminating the need for respirators during milling operations.

If you have any questions or concerns please contact me at the number below.

Sincerely,

Hank Kogel

Hank Kogel
Product Development and Global Technologies
Caterpillar Inc.
(309) 698-5803

January 14, 2014

Mr. Mike Acott
National Asphalt Pavement Association
5100 Forbes Blvd.
Lanham, MD 20706-4407

Re: Silica/Milling Machine Partnership

Dear Mike:

Subsequent to our meeting at the NAPA offices in Lanham back on 20 November of last year we have had several meetings here at Roadtec to determine our official course going forward as it relates to equipment changes and enhancements to our milling machine product offerings for the foreseeable future. Our intentions are to do everything in our power to better protect our workers and in so doing provide a positive and proactive industry position leading up to the proposed OSHA silica rule hearings in the spring of 2014. For the record, our course of action is as follows:

1. Beginning with our technical training classes here at Roadtec in the winter of 2013/2014 we will contact all existing Roadtec milling machine owners and make them aware of the ability to upgrade their existing water systems (if necessary) to the so name "B2" water spray configuration that was tested back in 2009 and 2010 and was well received by NIOSH as the optimum water configuration for overall dust suppression. Since the B2 water configuration is standard equipment on some models of half-lane and larger Roadtec cold planers, in some cases no upgrade will be necessary. However, we are developing and will be offering an upgrade kit for Roadtec cold planers not currently equipped with the B2 configuration along with instructions for the proper maintenance and care of these systems so as to provide optimum dust suppression.
2. In the first quarter of 2014 Roadtec will publish a single page "silica information letter" as it pertains to cold planing equipment much the same as the sample letter that was provided to the committee by Wirtgen America when we met back in November. This letter will be sent to all Roadtec cold planer owners in concert with the above mentioned notification of available upgrades to their existing water systems. We will also continue to bring attention to and advocate the Partnership product, Operational Guidance for Water Systems During Milling Operations (Best Practices Bulletin 1/12).
3. Finally, based on the perceived positive position taken by NIOSH as it pertains to vacuum dust evacuation systems for cold planers, Roadtec will aggressively pursue final designs for said devices throughout 2014 with the intention of making these systems standard in January 2015 on all half-lane and larger cold planers. Our intention is to offer these devices on an optional basis in 2014 as the designs are finalized but to have these systems as standard equipment across the board no later than January 2015.

We recognize the sense of urgency that is requisite in protecting our workers and we at Roadtec certainly want to do our part on a timely basis and thus we'll be moving forward with the above prescribed timeline regardless of the final position of the committee. Should you require any further information or clarification I hope you will not hesitate to contact us.

Sincerely,

Jeff L. Richmond, Sr.
President

WIRTGEN AMERICA

Wirtgen America, Inc.
6030 Dana Way -Antioch -TN 37013 USAPhone
(615) 501-0600 – Fax (615) 501-0691
www.wirtgenamerica.com

Mike Acott
President
National Asphalt Pavement Association
5100 Forbes Blvd.
Lanham, MD 20706

Dear Mr. Acott,

Wirtgen has been working with the Silica Milling Machine Partnership for over a decade to study respirable dust and airborne silica generated by half lane milling machines cutting asphalt. Our efforts have prepared Partnership members to implement effective dust controls, training, operation, and maintenance to minimize respirable dust and airborne silica exposure levels on asphalt milling job sites.

The Partnership tested all brands of road milling equipment with a variety of different water spray controls and sealing configurations. Tests were conducted on a broad range of job sites under various milling conditions. So many variables created inconsistency in dust level measurements. NIOSH real milling time exposure data from Wirtgen baseline at 12 gpm water flow back in 2004 indicated compliance with existing PEL but did not provide required level of confidence to pass proposed lower PEL of .050 mg/cu-m. Even if TWA was utilized, the data scatter was a problem.

At Marquette, MI (2008), all brands of milling machines were tested at a single job site to compare and evaluate water spray controls effectiveness. A promising water spray control system emerged with the B2 test results.

Wirtgen prepared for next round of water spray testing by using B2 configuration as a benchmark - ensuring water flow and pressure equal to or greater than B2 configuration. The Wirtgen machine was modified to test standard Wirtgen nozzle type and layout at the higher flow (configuration A1). The Wirtgen machine was also modified to test nozzle type, and layout patterned after B2 configuration at the higher flow (configuration A21). Special attention was given to ensure proper sealing around housing and primary conveyor. The cutter housing front moldboard was positioned to ride on the road surface to ensure the highest level of confinement for milled material and dust generated.

At Shawano, WI (2010), all brands of milling machines were tested at a single job site to evaluate water system updates. OSHA also arranged for personal hygiene testing of the B2 configuration. The personal hygiene test showed that B2 passed with personal silica exposures below current PEL and proposed PEL. Even though hygiene testing was not performed on Wirtgen machine in 2010, we can compare mean respirable dust concentrations measured on Wirtgen machine to the B2 benchmark to gauge the performance of the Wirtgen standard system (A1) and Wirtgen system with modified nozzle types (A21). NIOSH EPHB Report No. 282-18a, Appendix A data shows that maximum mean respirable dust concentrations over 16 trails for A1 and A21 were both lower than B2 maximum in 2010. Furthermore, the averages of the mean respirable dust concentrations over 16 trials for A1 and A21 were both lower than B2 average in 2010. Additionally, the standard Wirtgen nozzle layout and type (A1) performed better than nozzles used to closely model B2 configuration (A21). Based on these results, we believe that basic minimum design parameters for high performance water spray controls should be patterned after B2 configuration and include only these basic requirements for half/full lane milling machines:

Maximum water flow ≥ 19 gpm
Maximum water pressure ≥ 20 psi
Number of nozzles in drum housing ≥ 10 nozzles
Number of nozzles at primary transition (housing to prim. conv.) ≥ 2 nozzles
Number of nozzles at secondary transition (prim. conv. to sec. conv.) ≥ 2 nozzles

Experimental vacuum systems were also tested at Marquette and Shawano with promising results for significant reductions in respirable dust. Subsequent testing with Wirtgen VCS (Vacuum Cutting System) along with standard water system has been completed with excellent results. NIOSH designed a testing program that provided enough samples to indicate that a Wirtgen half lane machine with VCS and water spray passed current and proposed PEL with 95% confidence.

To assess Wirtgen half/full lane milling machines currently in operation and currently in production, see table below showing Wirtgen half/full lane milling machines produced from 2007 until present. This table includes water system design and performance data for all half/full lane models. It also shows where Wirtgen VCS is available as an option and also where it is available as a retrofit kit. Wirtgen has one half lane milling machine model (W1900) that does not meet the "high performance" water spray control requirements listed above.

Wirtgen has already updated machine start up training and operator training programs to include the "Operational Guidance for Water Systems During Milling Operation" document created by the Silica Milling Machine Partnership and published by AEM. It is vital that operators understand the importance of dust control and how to operate and maintain their machines to minimize respirable dust.

Wirtgen will implement a silica program where personal hygiene testing will be performed on Wirtgen half/full lane milling machine operators annually to create a historical database of respirable dust and silica exposures.

Wirtgen will prepare a water system retrofit kit for the Wirtgen W1900 half lane milling machine. This kit will include larger nozzles to increase total maximum water flow to 24 gpm while still maintaining water pressure above 20 psi (see W1900** column on table below). This "high performance" water system upgrade kit will be available by January 1, 2015. All other Wirtgen half/full lane milling machines since 2007 meet the minimum "high performance" water spray system requirements listed above.

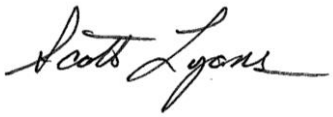
Wirtgen VCS options are available for all Wirtgen half/full lane milling machines currently in production for North America. Wirtgen VCS retrofit kits are available for all half/full lane milling machine models (except for W1900) going back to 2007. Wirtgen will make VCS standard on all half/full lane milling machines by 2017.

Wirtgen Water Spray Controls for Half / Full Lane Machines (drum width ≥ 2000mm): 2007 - Present				
	W1900*	W1900**	W2000, 2100, 2200	W200, 210, 220, 250
Water System Total Flow and Pressure				
Max Operating Water Flow	13.2 gpm	24.2 gpm	19 gpm	21.5 gpm
Water Pressure at Max Operating Flow	58 psi	50 psi	280 psi	95 psi
Cutter Drum Housing Nozzles				
Number of Nozzles	18	18	20	24
Nozzle Model	Teejet 11005-SS	Teejet 11010-SS	Teejet 11003-SS	Teejet 11005-SS
Spray Type	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN
Flow per Nozzle	0.6 gpm @ 58 psi	1.1 gpm @ 50 psi	0.79 gpm @ 280 psi	0.77 gpm @ 95 psi
Total Flow to Cutter Drum Housing	10.8 gpm at 58 psi	19.8 gpm @ 50 psi	15.8 gpm @ 280 psi	18.5 gpm @ 95 psi
Primary Transition (Cutter housing to Primary Pick-up Conveyor)				
Number of Nozzles	2	2	2	2
Nozzle Model	Teejet 11005-SS	Teejet 11010-SS	Teejet 11003-SS	Teejet 11005-SS
Spray Type	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN
Flow per Nozzle	0.6 gpm @ 58 psi	1.1 gpm @ 50 psi	0.79 gpm @ 280 psi	0.77 gpm @ 95 psi
Total Flow to Primary Transition	1.2 gpm at 58 psi	2.2 gpm @ 50 psi	1.6 gpm @ 280 psi	1.5 gpm @ 95 psi
Secondary Transition (Primary Pick-up Conveyor to Secondary discharge Conveyor)				
Number of Nozzles	2	2	2	2
Nozzle Model	Teejet 11005-SS	Teejet 11010-SS	Teejet 11003-SS	Teejet 11005-SS
Spray Type	FLAT FAN	FLAT FAN	FLAT FAN	FLAT FAN
Flow per Nozzle	0.6 gpm @ 58 psi	1.1 gpm @ 50 psi	0.79 gpm @ 280 psi	0.77 gpm @ 95 psi
Total Flow to Secondary Transition	1.2 gpm at 58 psi	2.2 gpm @ 50 psi	1.6 gpm @ 280 psi	1.5 gpm @ 95 psi
VCS Vacuum Dust Controls				
VCS Option Available	NA - Obsolete Model	NA - Obsolete Model	Yes	Yes
VCS Retrofit Kit Available	No	No	Yes	Yes
*Maximum operating flow below current recommendation for "high performance" water system - See **.				
**Performance with larger nozzles installed to achieve required maximum operating flow. Reduced pressure still above minimum pressure requirment.				

The Silica Milling Machine Partnership defined challenges and solutions for achieving effective control of respirable dust. Accordingly, we need to develop and implement the most effective controls and train operators to run and maintain the equipment properly in order to minimize respirable dust exposure. We must provide regulation recommendations that will protect operators and provide realistic, feasible guidelines for the industry to follow, thus ensuring effective respirable dust control.

Sincerely,

James McEvoy
President
Wirtgen America, Inc.



Scott Lyons
Engineering Manager
Wirtgen America, Inc.

VOLVO CONSTRUCTION EQUIPMENT

13-January-2014

Mr. Mike Acott
National Asphalt Pavement Association
5100 Forbes Blvd.
Lanham, MD 20706-4407

Dear Mike:

Consistent with the other OEM members of the NAPA Silica/Asphalt Milling Machine Partnership, we at Volvo Construction Equipment have continued to work tirelessly at moving forward with the development of an executable plan to support the adaptation of our half-lane MT2000 highway class milling product to align with the favorable findings of the Partnership's engineering controls development and evaluation process. With safety being one of Volvo Construction Equipment's stated Core Values, our company intends to continue to focus on worker wellbeing in a proactive manner in support of the proposed OSHA silica emissions regulations hearings planned for 2014. For the record, our plan is as follows:

1. Volvo will advocate for NAPA and AEM's Best Practices and Operational Guidance document for Water Spray Systems During Milling Operations (Best Practices Bulletin 1/12). We at Volvo will also continue to work with and train customers of our own and other manufacturers' milling products.

2. Volvo will make available for purchase to our customers an Optimized Water Retrofit Kit similar in design and performance to the well performing Roadtec B2 system by Jan 2015 for all legacy MT2000 units.

3. Volvo will make standard the aforementioned Optimized Water Kit and a Vacuum Cutter System on all new half lane and larger milling machines beginning in Jan 2017.

Volvo takes seriously our commitment to the concerns and interests of the road building industry and those individuals whom dedicate their daily efforts in making this industry a success. We recognize the importance of protecting its workers and Volvo Construction Equipment wants nothing more than to do our part as expeditiously as we can. Should you require any further information please do not hesitate to contact us.

Sincerely,

Robert Begley
Product Range Leader – Paving, Milling, Motor Graders
Global Product and Segment Management
Volvo Construction Equipment

www.volvo.com

Volvo Construction Equipment
312 Volvo Way
Shippensburg, PA 17257

Telephone
switchboard
717-532-9181

Telefax
717-530-3408

Atlas Copco

23-January-2014

Mr. Mike Acott
National Asphalt Pavement Association
5100 Forbes Blvd.
Lanham, MD 20706-4407

Dear Mike:

I am writing this letter on behalf of Atlas Copco Road Construction Equipment Division (manufacturer of the Dynapac line) relating to the Silica/Asphalt Milling Machine Partnership efforts. We have been an active member of the Partnership for years even though we are not selling half lane or larger milling machines in the USA at present. We are actively engaged with the Partnership to contribute our expertise in the development of the best practices that improves safety and workers health when they are exposed to crystalline silica in the milling environment. Atlas Copco is strongly committed to a "***Safety First***" value in all areas of our operations including Design, Manufacturing and use of equipment. The efforts taken by the Partnership in controlling the exposure of crystalline silica with half lane and larger milling machines are in line with our commitment and we fully support the efforts. For the record our plan of action going forward is as follows:

1) Atlas Copco will continue to be an active member of the Partnership and provide our expertise and support to NAPA in developing Best Practices for Silica Exposure control with regards to asphalt milling operations.
2) Atlas Copco will design and implement necessary systems to our half lane and larger milling machines to control crystalline silica in accordance with the Partnership and any regulatory agencies mandates for the USA market. We will adhere to the timing of introduction of those updates to our machines.
3) Atlas Copco will strongly advocate and train our customers to follow "***Safety First***" in all activities.

Sincerely,

Vijayakumar Palanisamy
Product Marketing Manager, Atlas Copco RCE
Cell: +1 (210) 818-9602

Mining, Rock Excavation and Construction LLC
8701 E. 68th Ave.
Commerce City, CO 80022 USA
USA
www.atlascopco.us

January 22, 2014

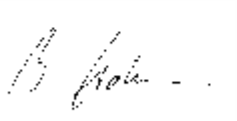
Mr. Mike Acott
National Asphalt Pavement Association
5100 Forbes Blvd.
Lanham, MD 20706-4407

Dear Mr. Acott,

I am writing on behalf of BOMAG Americas, Inc.
As discussed in the November 20, 2013 meeting of the Silica/Asphalt Milling Machine Partnership, BOMAG is in concert with the other OEM members and supports the position of NAPA and AEM and their response to OSHA's proposed silica regulation.
As one of the worldwide largest manufacturers of road building and compaction equipment BOMAG has a long standing history of putting safety first. Our continuous focus on providing a safe work environment for operators and workers has always been part of our innovative strategies.

In detail, regarding the milling machines in specific, BOMAG has developed a new generation of milling equipment, which will be introduced and brought to market in North America in the first quarter of 2014. This new generation of milling equipment sports a water system as well as a dust evacuation system to keep the silica dust levels under control. The intent is to have one of these units fully tested by NIOSH to make sure that we meet or beat the recommended silica dust exposure levels.
We have also already started to investigate retrofit kits for older milling machines and intend to have them available for sale in 2015.
Our goal is to have our entire range of cold milling machines ready well before January 2017, and be equipped with the NIOSH suggested water and evacuation systems to reduce the silica dust exposure levels to be below the proposed permissible limits.
Should you have any question or require any further information please don't hesitate to contact us.

Sincerely,



Bert Erdmann
Director Engineering
BOMAG Americas, Inc.
bert.erdmann@bomag.com
(309) 852-6154

BOMAG Americas, Inc. - 2000 Kentville Road - Kewanee, IL 61443
Tel.: (309) 852-0071 - Fax: (309) 852-0080
www.bomag.com/us

APPENDIX II

Power Point Presentation to the Silica/Asphalt Milling Machine Partnership

December 14, 2010; Pittsburg PA

Whitney Long, CIH

Eastern Research Group, Arlington, Virginia

Asphalt Milling — With Supplemental Engineering Controls

OSHA Air Monitoring: Personal Breathing Zone Crystalline Silica

11–12 August 2010


Asphalt Milling –
with Supplemental
Engineering Controls
OSHA Air Monitoring: Personal
Breathing Zone Crystalline Silica
11-12 August, 2010
Whitney Long, CIH
NAPA Silica Partnership meeting, December 14, 2010; Pittsburgh PA
1

OSHA's Primary Interest in Wisconsin Tests:

- Can supplemental dust controls limit worker silica exposure?
  - Emphasis on the operator and groundmen
- This was not a comparison of control methods.

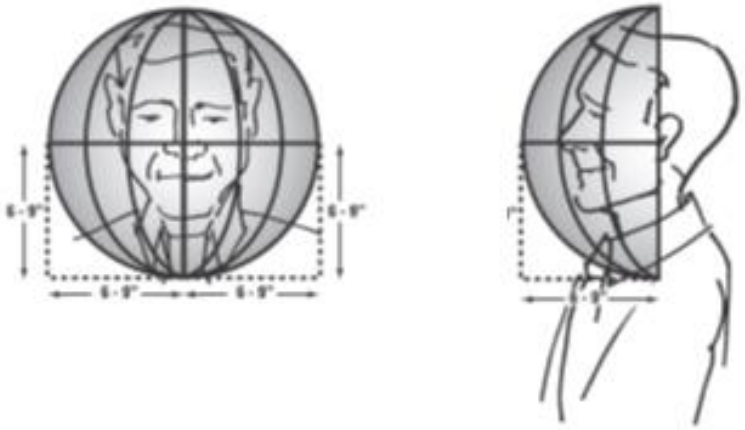
2

OSHA rulemaking: crystalline silica

- Valuable to see activity first-hand
- Valued sample characteristics include:
  - Personal breathing zone.
  - 8-hour time-weighted average (1 shift).
  - Typical work activities performed in the usual manner.
  - Analytical limit of detection (LOD) at a useful level.

3

Personal Breathing Zone



4

Limit of Detection (LOD)

- Lowest concentration of silica that can be detected.
  - Depends on method and sample volume (duration).
  - Longer sample = lower limit of detection.

Example concentration LOD with typical analytical method (historical, assuming 1.7 liters/min. sampling rate)

Sample Time	LOD
8 hours	12 ug/m^3
4 hours	24 ug/m^3
2 hours	48 ug/m^3
1 hour	96 ug/m^3

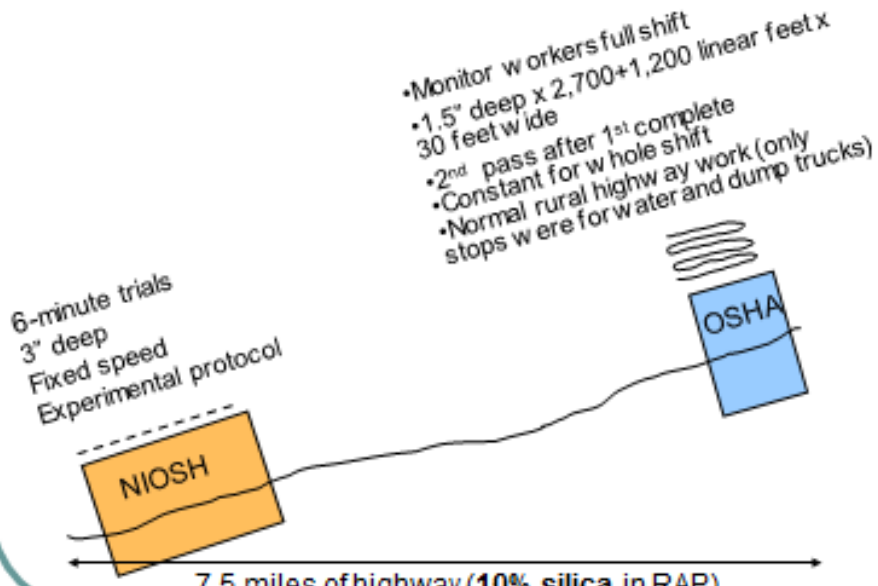
5

OSHA Tested Configurations that Worked Well Previously

- NAPA arranged time with two best-performing machine configurations identified during tests in Marquette.
  - Machine B2 (additional water spray on conveyers).
  - Machine D3 (exhaust ventilation – vacuum suction).

6

Distinct segments of same worksite



7

DAY 1

- Machine D
  - **Exhaust suction at drum housing** (low/"Idle" speed – not exactly Marquette D3 configuration: different fan and ductwork).
  - Usual cooling H_2O at drum (22 gpm) "made ground wet."
  - 7.2-foot drum width.
  - 75 ft/min speed.
  - 90 minutes milling in 2 hours tested.

8

Machine D3

9

DAY 2

- Machine B
  - **Supplemental H_2O spray at transitions** on conveyer transitions.
  - Usual cooling H_2O at drum .
  - Combined total H_2O = 18-19 gpm (ground damp).
  - 8.2-foot drum width.
  - 110 ft/min speed (top speed, catch-up schedule).
  - Near constant milling for 7 of the 8-hr shift.

10

Machine B2

Only brief stops for water or dump trucks

11

Exposure limits

- OSHA's current gramivetric respirable crystalline silica Permissible Exposure Level (PEL) = 100 ug/m^3.
- OSHA communications regarding a proposed rule consider various options
  - e.g., SBRFA materials (OSHA docket) considered values ranging from 25 ug/m^3 to the current gravimetric PEL (25, 50, 75...etc). OSHA has not yet announced a level.
  - NIOSH REL is 50 ug/m^3.
  - ACGIH TLV is 25 ug/m^3.

12

SAMPLING RESULTS

Crystalline Silica in Wisconsin Worksite RAP 2010		
Sample 1 (June)	RAP from roadside	10.0 % quartz
Sample 2 (August)	Milled RAP - center road	10.0 % quartz
Sample 3 (August)	RAP dust on strut under conveyer	9.0 % quartz

13

SAMPLING RESULTS

Worker Breathing Zone Silica Machine D3 (test < 2 hours)		
Machine D - personnel	**Respirable DUST (mg/m^3)**	**Respirable QUARTZ (ug/m^3)***
Operator (at top)	0.099	<46.9
Roving Operator (alternate, usually at top)	0.14	<48.1
Groundman (on ground)	0.233	<51.8

*All results below the limit of detection (LOD) due to short sampling period.

14

SAMPLING RESULTS

Worker Breathing Zone Silica Machine B2 (test 8 hours)		
Machine B - personnel	**Respirable DUST (mg/m^3)**	**Respirable QUARTZ (ug/m^3)**
Operator (at top)	0.376	13.9 *
Roving Operator (alternate, usually at top)	0.455	<12.4
Groundman (on ground)	0.354	<12.4
*3.7 percent quartz Minimal particulate settling occasionally noticed downwind.		

15

CONCLUSIONS

- Exposure levels for all workers were below OSHA's current gravimetric PEL.
- Exposure levels (silica and dust) suggest that supplemental engineering controls are beneficial and control silica and dust well under the conditions monitored.
- Percent silica tends to be lower in air sample than in bulk RAP on the road (at Wisconsin site: 3.7% in air vs. 10.0% in RAP).

16

Keep in Mind...

- Airborne silica would likely be higher if RAP contained a greater % silica.
  - Silica % in RAP can easily be 2 times greater than seen in Wisconsin test, 3x or 4x greater is also possible but perhaps less common.*
  - Hypothetical example:
    - 2x the airborne level seen in Wisconsin test = 27.8 ug/m^3.
    - 3x = 38.7 ug/m^3.
    - In both examples the level is less than 50 ug/m^3, but greater than 25 ug/m^3.

*Based on an informal review of bulk RAP samples in NIOSH and related studies; % silica depends on aggregate and sand types and percentage in RAP.

17


Questions???

Acknowledgments

Many thanks to:

- NAPA and its members
- NIOSH (for sharing the sampling opportunity)
- Hardworking representatives of many organizations, who kept things running smoothly in Wisconsin.

Whitney Long, MPH, CIH
Eastern Research Group, Arlington VA
Whitney.long@erg.com tel: 703-841-0498

19

APPENDIX III

Operational Guidance for Water Systems During Milling Operation

Best Practices Bulletin 1/12

PROJECT PREPARATION

- Are there an adequate number of trained personnel for safe operation?
  - ◊ According to OSHA, each company needs to have a silica program to ensure that all employees have been trained in silica standards.
- Plan how water will be provided on the job site.
  - ◊ Ensure that water truck has enough capacity. Are permits and the proper hose and pumps on the job site?
- Know the work area. Insure work area is adequate to safely maneuver transport vehicle in work zone.
- Consider environmental conditions, such as freezing temperatures.
  - ◊ Possibly locate source for heated water or antifreeze for water tank.
- Ensure that the water filling points are accessible from the front and rear of the machine on narrow lane closures.
- Ensure that there are proper lighting and markers on the water truck for night operation.
- During winter months, make sure that the water system is winterized to ensure proper operations in cold weather and during shutdown overnight.
- If working at night, provide adequate lighting for safe operation. Have preparations been made to perform maintenance and inspections, and safely transfer water?

Safe operators know the work area and any potential hazards.

SAFETY RESOURCES

For cold planer Safety Manuals visit:
http://shop.aem.org

OPERATIONAL GUIDANCE FOR WATER SYSTEMS DURING MILLING OPERATION

NATIONAL ASPHALT PAVEMENT ASSOCIATION

AEM

www.aem.org

www.asphaltpavement.org

Best Practices Bulletin 1/12

PRE-OPERATION INSPECTION

- Ensure that the mill has adequate water supply to begin operations.
- Check pump pressure to ensure that water pressure is set to manufacturer's recommended specifications.
- Check individual spray bar locations to ensure that all nozzles are functioning correctly with a good spray pattern.
- Verify that all nozzles are functioning properly and spray pattern is correct for the designated location.

WARNING

TO AVOID INJURY:

- **Read and understand manuals before operating.**
- **Keep hands clear of moving conveyor.**
- **Keep crew clear during machine movement.**
- **Stay away from cutter and discharge areas.**

PREPARE FOR SAFE OPERATION

Before you begin to operate the machine, take time to check that it is in good working condition.

- Check and use all available protective and safety devices, such as railings, safety tread, handholds, and interlock devices.
- Perform daily and periodic service procedures as instructed by the equipment manufacturers.
- Check for broken, missing or damaged parts and loose or missing fasteners. Make any necessary repairs.
- Check that no warning tags have been placed on the machine.
- Check that warning signs, special instructions, and operator's manuals are readable and in the proper location.
- Ensure all doors, safety devices, guards, and covers are in place and secured properly.

Operator training

- The operator must demonstrate a thorough understanding of the dust suppression systems on the machine:
  - Water system operation
    - Water application locations within the machine
    - Flow rates
    - Spray patterns
    - Anticipated water usage per unit time or per unit square yard.
    - Maintenance - ensure correct nozzles per manufacturer's specifications.
    - Troubleshooting
    - Check in-line water filter
  - Visual inspection of seals, flashing, and enclosures, to ensure minimal dust leakage.

OPERATION

- Maintain clean water supply to the milling machine. Maintaining a clean water supply will reduce the chances of clogging strainers and nozzles.
- Monitor clean nozzles and water switch or flow control settings and system pressure to ensure proper application rate.
- Monitor conveyor belt speeds. Slow conveyer speed can cause material to stay in the housing longer, thereby reducing production and possible creating more airborne dust.
- Inspect and replace cutting tools (bits/teeth) as needed. Dull teeth reduce cutting efficiency, thereby reducing production and possibly creating more airborne dust.
- Front moldboard setting: lower front moldboard and / or primary conveyor to maximize housing exit window area. Reducing the exit window area will keep material in the housing longer, reducing production and creating more airborne dust.
- Make sure that the cutter drum kicker paddles are in good condition. Worn-out paddles will allow material to stay in the drum housing longer, reducing production and creating more airborne dust.
- Inspect the flashing that seals the conveyor frame to the belt. If worn and not replaced, dust / material exits the conveyor prematurely and can cause significant dust issues.