

COMMENTS OF STILLWATER MINING COMPANY
IN RESPONSE TO THE MINE SAFETY AND HEALTH ADMINISTRATION
ADVANCE NOTICE OF PROPOSED RULEMAKING ON DIESEL PARTICULATE
MATTER EXPOSURE OF UNDERGROUND METAL AND NONMETAL MINERS
67 FEDERAL REGISTER 60199 (SEPTEMBER 25, 2002)

Stillwater Mining Company submits the following comments in response to the Mine Safety and Health Administration's ("MSHA") Advance Notice of Proposed Rulemaking ("ANPRM") dated September 25, 2002 (67 Fed. Reg. 60199-202). Stillwater Mining Company appreciates MSHA's solicitation of comments on the anticipated proposed rulemaking, and welcomes the opportunity to share its thoughts and comments as the Agency formulates its proposed rule for notice and comment in 2003.

As MSHA is aware, the impending proposed rule is the result of two years of good faith work and negotiation between the Agency, industry and other parties to the litigation. Stillwater Mining Company participated in the joint study efforts that have been highly productive in settlement of differences as to how the DPM standard evolved. Stillwater Mining Company welcomes any further discussions and testing MSHA may desire for further clarification made throughout the comments that follow.

MSHA, upon examining the underlying science, will determine that the scientific background information does not justify a DPM PEL and must at that time eliminate the final PEL of 160ug/m³.

Prior to addressing the specific comments, Stillwater Mining Company urges MSHA to address the issue of scientific basis for a diesel exposure limit, including the 400ug/m³ limit converted to Elemental Carbon. Stillwater Mining Company again wishes to note the pending completion of the multimillion-dollar NIOSH/NCI study of potential health effects of diesel exhaust in about 10,000 miners included in the study. This study, as has been referenced by Congress, will provide the necessary scientific foundation for any necessary diesel exposure limits. MSHA should eliminate, at least, the final concentration limit until such a time that sound scientific information is available indicating a need for a PEL and the specific substance to be regulated. In this light, it is important to note that the Total Carbon (TC) PEL was simply a selected surrogate for diesel particulate matter (DPM). Again, DPM is composed of thousands of components that vary for each diesel engine and also vary due to operational conditions, without any scientifically established adverse health effects caused by Total Carbon, Elemental Carbon.

Further, MSHA is also required to undertake a review regarding the health science underlying any PEL proposal and final rule, and the engineering science underlying any determination that proposed or final rules are feasible. It is also suggested that the science strongly supports the revocation of the final PEL included in MSHA's January, 2001 rule and a stay of enforcement of the Interim PEL, pending a sound feasibility determination.

Stillwater Mining Company also suggests if MSHA complies with its legal requirements, it must conclude that MSHA's PELs, both interim and final, are not supported by sound science. The result of settlement negotiations which left the industry with the interim 400ug/m³ standard should also be removed as it was based on negotiations aimed at the challenged rule and not sound scientific data.

Stillwater Mining Company does not imply that a PEL is unnecessary to protect the health and well-being of our miners, however that PEL must be based on sound scientific data.

Interim PEL enforcement of 400ug/m³, converted to Elemental Carbon, should be suspended until feasibility data is made available.

The regulated limits do not comply with other laws requiring sound, unbiased, and reviewed science to support regulatory limits. MSHA's conclusions contained in the draft MSHA study report are directly contradicted by: (1) MSHA's settlement acknowledgement in the settlement agreement that a Total Carbon surrogate is not feasible and its agreement to convert the interim standard to elemental carbon; (2) actual field data that contradicts the assumptions made by the MSHA report, and its reliance on the Agency's compliance "estimator." Although the Joint Study was highly admirable and the first of hopefully many cooperative efforts between the Agency and Industry, the study identified numerous interferences with DPM sampling, but could not adequately and completely analyze for such contaminants as environmental tobacco smoke (ETS). Similarly, the Joint Study revealed significant data gaps in MSHA's technical and economic feasibility analysis, like assumed ventilation that did not exist in reality. The reports by Dr. Tom Hall and H. John Head are also made part of this rulemaking record by other parties and must be taken into consideration. In the coal industry, MSHA itself has acknowledged that DPM rules are not technically feasible by publishing information demonstrating that certain filtering devices produce dangerous levels of NO₂ and may create fire hazards in underground mines. In conjunction with the MSHA acknowledgement, the currently available DPM filters use technologies that are not as efficient at reducing HC and CO exhaust products as previously used catalytic converters. The increased operating temperature also diminishes the ability to control NO_x emissions. Experimentation in the underground mining environment with developing control technology must be undertaken in highly controlled and safe conditions, before establishing rules that may endanger miners.

Many of the questions that MSHA has posed in its ANPRM address the same series of issues that the Joint Study did not resolve. Primary among those issues is the availability of control technologies that would allow those mines out of compliance with the interim exposure limit to reduce DPM emissions and achieve compliance. As MSHA has already demonstrated and published, the available control technology may pose greater risks than what is speculated by DPM.

Although the Mine Act is intended to advance technology, there has been no full-scale in-mine tests of diesel control technologies that support the availability of effective DPM controls that reduce exposures to the mandated interim PEL. Essentially, the opposite is true as US and Canadian industry and government researchers continue their struggle in identifying and testing feasible and effective technology for the vast array of equipment in use; keeping in mind that this testing can only be performed on one piece of equipment at a time.

As MSHA is aware, recently NIOSH and industry have initiated efforts to create and develop in-mine technology testing in the hopes of developing sufficient technologies that can be made widely available on the market for mines experiencing out-of-compliance mines to use. Stillwater Mining is currently involved in these testing plans. Keeping this continual study work in mind, Stillwater Mining Company urges MSHA to propose a permanent stay on enforcement of the interim DPM exposure limit until adequate scientific data exists to support such requirements. MSHA should also consider staying the effective date of enforcement of the interim standard until the NIOSH study work has been concluded.

Stillwater Mining Company Responses to MSHA's Specific Questions in the ANPRM.

1. Section 57.5060(a) and (b); Limit on concentration of diesel particulate matter.

(a) Appropriate interim and final limits if EC is the surrogate:

As previously stated, Stillwater Mining Company does not believe that a sound scientific basis has been established to support exposure limits on DPM. MSHA must convert the 400ug/m³ limit to a more reliable elemental carbon PEL due to the repeatability of results and the reduction of interferences to the TC surrogate. SMC also notes that there are no perfect means of monitoring DPM using either TC or EC methods as these two “products” are merely surrogates. Sampling and analysis error and various interferences documented in the field show a clear need for assuring that non-compliance determinations are valid, before enforcement. Until a DPM surrogate linked to health effects is proven and accurate analysis measurement is shown to be feasible, MSHA enforcement must account for error and variability prior to making enforcement decisions.

SMC is also concerned that the sampling and analytical process is in such infancy that it does not lend itself to be reliable enough for regulatory sampling. SKC has made yet additional changes to the impactor being used by MSHA, which further supports the previous statement. SMC recommends that NIOSH conduct tests reliability and sufficiency of the SKC sampling device, and its comparability to the device that was previously used by MSHA and industry during the Joint Study. MSHA may also want to consider the market availability of the sampling device as there are significant back-order and manufacturing time delays affecting our ability to possess the sample media. Also, if this sample media is consistent with past media, shelf life will drastically effect any total carbon measurements by adsorbing Organic Carbon from the polystyrene assembly onto the filter media, thus increasing the TC measurement. Therefore, MSHA will, in affording the operator the courtesy of hanging side-by-side samples, have to give an operator advance notice of its intention to sample in order for the operator to have adequate media on hand.

SMC urges MSHA to review the Settlement Agreement value of 320 ug/m³ for elemental carbon, with an appropriate error factor and certain procedural protections to avoid false readings. Samples taken, during the Joint Study, within our operation indicated EC: TC ratios closer to 85%. SMC urges MSHA to investigate whether or not the conversion ratio changes depending upon the elemental carbon loading on a particular sample.

(b) Elemental Carbon personal sample error factor.

MSHA's efforts to develop an appropriate error factor are admirable, but SMC urges MSHA to conduct both inter and intra-lab sampling and analysis on spiked elemental carbon samples to obtain reliable, reproducible information. A sampling protocol designed to mimic and create an applicable AIHA PAT program is the appropriate model for MSHA to adopt.

Because inter- and intra-laboratory variability are themselves interdependent, MSHA should create an error factor model that accounts for the joint and related variability in laboratory analysis, and to then combine that variability with pump flow rate, sample collection size, other sampling and analytic variables. Then, based upon a statistically strong database, MSHA should be able to determine the appropriate error factor for elemental carbon samples.

In addition to the normal error factor considerations, MSHA should include a sample review methodology and an error factor component accounting for location on the filter from which the sample punch was collected. The 31 Mine study, and the “second punch” analysis indicated variation in sample results among the various sample punches. Although great care was taken with the controlled samples and variability was not unreasonable, SMC believes from past industry experience that production sampling and analysis will increase this variability. Stillwater Mining Company strongly recommends a sample retention program that will permit mine operators to obtain a punch for analysis from any sample analyzed by MSHA.

(c) Interferences in the MNM elemental carbon personal samples:

The Joint Study was, unfortunately, unable to adequately determine the total effects of interferences upon the DPM sampling. With such limited data, MSHA cannot effectively propose regulations based on a surrogate for DPM until these interference issues are resolved.

(d) Necessity of a field blank

Should any reference be made to TC, field blanks from separate lots should be utilized for all compliance testing. The purpose is to determine the extent to which the field blank is adding to the TC result by the off gassing of OC. The manufacturing problems encountered by SKC as well as the continued refinement of the impactor justify the need for field blanks as well so we strongly urge MSHA to propose the use of field blanks in all compliance sampling.

2. Section 57.5060(c) -- extensions of time to meet DPM concentration limits.

(a) Circumstances necessary to permit time extensions

Stillwater Mining Company urges MSHA to propose that any mine demonstrating a “good faith” attempt to reduce in-mine DPM levels be granted a one-year renewable extension of time to meet the compliance level. SMC also recommends that until feasible control devices are demonstrated to be effective and commercially available for current in-mine equipment, the operator may request and be automatically granted an extension.

(b) Extension Duration

Renewable, annual extensions should be adopted. MSHA would be allowed, within this provision, to review evidence of “good faith” efforts toward compliance during the extension period. MSHA should also be part of these efforts in the form of compliance assistance and information sharing.

(c) Extension Renewal

As also noted above, MSHA should propose allowing mines repeated extension renewals so long as they demonstrate good faith efforts to reduce DPM levels. These renewals should be nearly automatic until such time when feasible, effective controls are readily available to industry.

(d) Required Operator Actions During Extension Periods.

Although MSHA can seek to examine the “good faith” efforts of an operator to mitigate DPM levels during any extension period, each mine is unique in its ability to control DPM. This variability among the operations does not support a universally applicable “recipe” for compliance. For example, some operations may only be able to step up equipment maintenance where as other operations may have financial capabilities to upgrade ventilation and experiment with new exhaust controls that are under development.

MSHA should also acknowledge that operators subject to an extension could employ appropriate personal protective equipment and possibly administrative controls to ensure that miners are not exposed to objectionable DPM levels. Research needs to be expedited on approved PAPR devices for the protection of miners.

3. Section 57.5060(d) - exceptions to the concentration limit.

(a) Is this Provision needed if MSHA adopts its current hierarchy of controls?

This provision can be deleted if the current hierarchy of controls used by MSHA in MNM operations is applied to all affected miners. The provision, as drafted, is limited to inspection, maintenance or repair activities, which presumes that miners must be protected in some fashion at all times.

(b) The impact of removing this provision

Stillwater Mining Company does not see an impact from the removal of this provision, since current MSHA policy requires protection and permits PPE and administrative controls in non-compliance situations.

4. Section 57.5060(e) prohibits use of personal protective equipment to comply with the concentration limits; and Sec. 57.5060(f) prohibits use of administrative controls to comply with the concentration limits.

(a) Currently, there is no approved respirator for use in protecting miners exposed to DPM atmospheres. If MSHA includes requirements for some form of respiratory protection, what type of respirators would be protective of miners? What are their specifications?

Stillwater Mining Company strongly urges MSHA to delete this prohibition as it interferes with protecting miners. PPE may be more effective in protecting miners from suspected DPM health effects than any other available and feasible engineering control technology. We are confident that there are and will be approved respirators and air helmets that provide protection from DPM. Respirator manufacturers have advised the National Mining Association that:

“3M series P Filtering Facepiece Respirators and Series P Elastomeric Facepiece Respirators have been approved for applications similar to those encountered in the mining environment. These devices have proven efficiencies of either, depending upon the particular device chosen, 95 or 100

percent in filtering particles smaller in diameter than those emitted as TC from diesel-powered engines.”

These NMA comments are consistent with MSHA staff statements at “Outreach Meetings” indicating that effective respirators are available. Other similar products are available from both North and Willson that protect against both particulate and organic vapors.

(b) Should MSHA propose to require mine operators to implement a written respiratory protection program when miners must wear respiratory protection?

MSHA should not propose a separate written respiratory protection plan. MSHA already has respiratory protection regulations, and the use of respiratory protection for DPM purposes should not be subject to a different regulatory scheme. Thus, MSHA should rely upon its existing regulations for respiratory protection, rather than develop new and potentially conflicting standards for DPM exposures only.

(c) Should MSHA require mine operators to apply to the Secretary for approval to use respiratory protection? Should the application be in writing? What conditions should MSHA require mine operators to meet before approval is granted to use respirators?

Stillwater Mining Company encourages applying all current respiratory protection regulations to DPM protection, but does not believe there is any value in requiring operators to file plans with the district manager before utilizing PPE. Simply put, new rules and filings will only increase administrative costs and reduce efficiency and manpower availability.

(d) Should MSHA propose to require mine operators to implement a written administrative control plan when they use administrative controls to reduce miners' exposures to the required limit?

Again, further filings and requirements will merely expend resources unnecessarily.

5. Section 57.5061(b) –MSHA compliance sample collection and analysis.

MSHA’s decision to change its DPM surrogate from Total Carbon to Elemental Carbon, as agreed in the second interim settlement agreement, is a sound decision. Although the decision is sound, inconsistency in sampling and analysis protocols have been noted during the Joint Study Sampling. Questioning the consistency of production samples collected by MSHA Compliance Specialists is at this juncture warranted. All parties closely scrutinized the Joint Study samples and this scrutiny may not be as meticulous during compliance visits. Therefore, a detailed sampling methodology and chain of custody requirement should be initiated so the mine operators will have confidence in the sampling and analysis process. Another recommendation is that the remaining sample is retained and made available for further analysis by the operator.

6. Section 57.5061(c) -- personal, area, and occupational compliance sampling.

(a) Operator cost implications to conduct personal sampling using an EC surrogate.

Personal samples, to remain consistent with the existing MSHA Program Policy, should be the only samples utilized for compliance determinations. Area samples are not valuable, by common Industrial Hygiene practices, unless they are used in survey activities. Area samples do not indicate exposures to individuals. No additional cost is expected as the NMAM5040 method is in place at several analytical laboratories.

(b) Operator experience with DPM sampling and analysis.

Operators, unless directly involved in the litigation and Joint Study, do not have the necessary knowledge of the DPM rule or the sampling peculiarities. Operators may not have the necessary personnel on staff to effectively sample and bring their operations into compliance. If this is the case, operators will be required to hire a consulting firm, utilize their insurance carrier, or hire staff IH personnel in order to take accurate DPM samples. Also, those operations that have not been involved in the process to date may be relying on baseline data that was provided using inaccurate sampling methods. Companies with IH staff personnel, in an effort to reach compliance, may also need to hire additional staff to absorb the already growing health requirements, i.e. HAZCOM, Part 62 Noise rule, respiratory protection, and general MSHA compliance requirements.

MSHA will have to use its health staff to help operators by providing comprehensive in-mine training and sampling assistance, in the absence of enforcement. MSHA's must also hold outreach meetings across the country to explain the current DPM rule, although the agency must work to ensure that only those knowledgeable in the settlement process conduct this outreach program in an effort to eliminate confusion. MSHA should also consider including industry personnel in the same training that the compliance specialists receive to reduce confusion and downstream administrative burdens.

(c) DPM sampling experience in other industries and other countries?

Some DPM sampling has occurred during the EPA's studies, however that sampling is not generally applicable to occupational exposure assessments. Efforts have also been undertaken in Canada by the DEEP study, but have yet to produce positive results on health risks or feasible, effective filter technologies. Again, MSHA should support the recommendation to stay its DPM enforcement and continue expanding its scientific data through NIOSH research and the DEEP study prior to imposing potentially meaningless enforcement on the mining industry.

7. Section 57.5062 -- diesel particulate control plan.

Another plan will not add value to the protection of miners. This plan will simply be another paperwork exercise that staff hygienists will be responsible for compiling and maintaining. If good faith efforts are taking place a control plan is unnecessary. MSHA has the ability to collect information relating to good faith efforts during regular inspections and neither group would benefit from further paperwork requirements.

Support for documentation of good faith efforts in controlling DPM exposures could be supported should MSHA stay the enforcement of the Interim Exposure limit, and delete the Final Limit.

8. Technological and economic feasibility.

Feasibility issues (technologic and economic) are perhaps the greatest barriers to the promulgation of a supportable and effective DPM rule. No data exists proving the technological and economic feasibility of the DPM rule. John Head's report and the Joint Study indicate the feasibility model MSHA used for their findings was flawed. The poor quality of MSHA's report, the lack of independent third party scientific review and the bias and inaccurate results identified by Mr. Head and Dr. Hall, invalidates the report's validity under the scientific data requirements discussed above and addressed in OMB's directive to MSHA. The purchasing and installation of DPM controls also demonstrate that such controls are significantly higher in cost than what MSHA estimated for their feasibility report and that the filters remain technologically restricted for use.

(a) What experience do you have modifying ventilation systems to reduce miners' exposure to DPM?

Stillwater Mining Company has initiated plans for ventilation upgrades and in doing so additional ventilation was added to assist with compliance to the DPM rule. This additional ventilation was an enormous expense. At present time, the cost is approximately \$15 per ft³ of air and we are still unsure of how effective this increase will be in reducing DPM.

(b) What were the costs to mine operators for auxiliary fans, booster fans, flexible ducts, or major ventilation upgrades necessary to meet the interim concentration limit?

Auxiliary and booster fans provide no value to an operation if the air is merely recirculated. A cascading type ventilation system uses previously used air and moves it on to the next work section after dilution. Particulate entrained in the air stream will continue to move through the mine and concentrations can build up quite rapidly. The best system is a flow through system where the air is used only once and exhausted out of the mine. A change over from a cascading type system to a flow through system is capital intensive and not always feasible for an operation from both financial and environmental aspects.

(c) What has been the experience of mine operators with retrofitting existing diesel-powered equipment, especially in the range with less than 50 hp, as well as equipment that has greater than 250 hp, with DPM control devices? What adjustment did mine operators have to make to DPM control devices before there were reductions in DPM levels?

Stillwater Mining Company's DPM device testing has begun to indicate that ancillary equipment and smaller horsepower mobile units will require extensive application testing, simply due to the variable thermal cycles. Several of these applications will not lend themselves to the use of oxidizing DPM devices. The cumulative potential of alternative DPM reducing technologies is relatively unknown. We must remember that many of the reactions are dependent upon temperature and gas stream composition. Therefore, the required testing for all of the potential combinations represents a lengthy undertaking.

Manufacturers are not readily open to retrofitting their engines with after-market devices and have indicated that warranty issues will arise as a result. Significant risks arise from using after-market devices to the equipment. Specifically engine backpressure noted from using filtering devices is

greater than that of a stock system. Finally, as noted by MSHA and industry, NO₂ concentrations do increase with the use of the catalyzed filtration devices.

NIOSH plans to undertake a comprehensive analysis of the issue with several different types of mines. Stillwater Mining Company will be part of that project. Until this study work is completed, MSHA should consider a stay of enforcement of the Interim exposure limit, pending completion and analysis of this important feasibility work.

(d) What are the engineering costs associated with retrofitting?

Unknown at present time.

(e) What technical assistance should MSHA provide to mine operators in retrofitting DPM control devices or evaluating a mine's ventilation system, or filtration systems in environmental cabs?

MSHA should make available to mine operators, advancements in technology regarding technical and economically feasible controls, with references to operator contacts that would be willing to assist other operators. MSHA should refrain from forcing repeated costly experiments at mines through the enforcement system, as it will increase the litigation and overall cost of compliance.

(f) Are there circumstances where mine operators have had to change an engine model to accommodate DPM control devices? What were the costs of the engine models?

Unknown at present time.

(g) How much did control devices cost for different horse-powered engines?

Stillwater Mining Company cannot respond to this question as we are still unsure of effective and proven controls exist on the market. The effectiveness of the control devices we are currently experimenting with cannot be measured because of the availability of both sampling media and a "clean" zone within our mine to perform such testing due to our cascading ventilation system. We will have the ability to collect this information through the NIOSH study in the coming year. With that said, MSHA should consider staying the Interim concentration rule and eliminating the final rule of 160 ug/m³.

(h) Did mine operators have to modify the exhaust system to apply the DPM control? What were the costs for doing so?

See above.

(i) What are the advantages, disadvantages, and relative costs of different DPM control devices?

See above.

(j) What types of DPM control devices are commercially available and how much do these devices cost?

Engelhard and DCL both have control devices on the market. The cost of these devices varies between \$7000.00 and \$12,000 per device. This does include installation costs.

(k) What are the engineering costs of the DPM control devices?

Stillwater Mining Company will defer this response to the cost estimates drafted by John Head, which were submitted to the record for the proposed rule.

(l) What current reductions in EC levels are mine operators experiencing from having installed DPM control devices? What is the experience with filtration efficiencies?

See (g) above.

(m) What has been the experience of mine operators with the useful life of DPM filters?

See (g) above.

(n) Is there any information available with DPM control filters in non-mining industries or in other countries?

Only the information gained in the DEEP study.

(o) What has been the experience of mine operators with DPM filters? Did filters fail or did they perform as the manufacturer predicted? If they failed, what were the causes of filter failure? What could be done to prolong the life of DPM filters?

See (g) above.

(p) Do mine operators have any technical data on their experience with using cabs with filtered breathing air?

Feasibility of cabs within our operations is a huge issue for both noise and DPM. The ability to install cabs on equipment does not exist within our mine due to dimensional constraints.

(q) Have you experienced increases in NO₂ when using any of the following?

(1) A base metal catalyzed filter; (2) a non- catalyzed filter; or (3) platinum-based catalyzed filter?

Stillwater Mining is aware of the same reports as noted by MSHA personnel regarding increases in NO₂ when using base metal and platinum filters. We have no independent information on these issues but may have more detailed information following the NIOSH project in the coming year.

(r) What effect do high altitudes have on the ability of the DPM control device to reduce DPM exposures?

Unknown at this time.

(s) What costs did mine operators incur for filters that were regenerated off board?

See (g) above.

(t) What costs did mine operators incur for filters that were regenerated on board?

See (g) above.

(u) Would active regeneration be feasible for your mine; such as off-board filter regeneration in an oven or on-board electrical regeneration?

See (g) above. However, logistically, Stillwater Mining Company would struggle with off-board regeneration unless two filters were available for each piece of equipment. Even then, human error would claim some filters by improper handling, dropping, and transporting these filters.

(v) What are the costs to mine operators for new engines and venting for filter ovens?

Unknown.

(w) Would fuel additives used to facilitate regeneration be feasible?

Unknown.

(x) Are there any significant technologies for controlling DPM when EC is the surrogate?

Stillwater Mining Company believes that DPM control technology should not vary between TC and EC. However, should science produce evidence that a particular component of Diesel Exhaust causes an adverse health effect, this component should be regulated instead of randomly selecting a surrogate such as EC or TC.

9. Paperwork Burden Issues.

What paperwork and other costs will you incur if changes are made to the DPM standard, particularly development of a written program for use of administrative controls, use of respiratory protection, and for development of a control plan?

Assuming that a control plan will not be required, significant paperwork issues associated with the proposed rule still exists. Written materials associated with proposed and potential administrative and engineering controls, increased paperwork related to training materials, respiratory protection, increased paperwork related to sampling, inspections and equipment repairs and maintenance.

Stillwater Mining Company appreciates your consideration of these responses to the ANPRM and look forward to opportunity of participating in the further development of this DPM rule.

Sincerely,

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(See attached file: SMC ANPRM comments 11-20.doc)